2020 Dry Weather Screening Report
APDES Permit No. AKS052558

FINAL REPORT

November 2020

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. ADEC reissued APDES Permit No. AKS052558, with revisions, on August 1, 2015, and August 1, 2020. The expiration date of the current permit is July 21, 2025.

The APDES MS4 permit continues the requirement of dry weather screening and subsequent follow-up actions to identify illicit discharges and associated pollutants to the MS4. The 2020 program was completed under the conditions and requirements of the permit dated August 1, 2015.[1]

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 stormwater.[2] 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

Dry weather screening 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 stormwater. Guidance on illicit discharge screening identifies a list of 15 indicator parameters that can be used to confirm the

[1] The reissued permit dated August 1, 2020 contains revisions to the requirements of the dry weather screening program compared to the August 1, 2015 permit. The program methodology will be updated in the Quality Assurance Plan (QAP) and submitted to ADEC for review within six months of the effective date of the reissued permit.
[2] 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)).

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).

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

The MS4 permit dated August 1, 2015 requires the MOA to sample dry weather flow from at least 15 stormwater 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 program 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.

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

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

Note: **Bold** watersheds were sampled in 2020.

In 2020, outfalls in the Rabbit Creek, Eagle River, and Hood Creek watersheds were prioritized for screening. Previous investigations have determined insufficient outfalls suitable for sampling are present in the Rabbit Creek watershed, so the next watershed on the watershed prioritization was selected for investigation. Previous investigations have determined that there are no outfalls suitable for sampling in the Peters Creek, Potter Creek, Mirror Creek, or Glacier Creek watersheds, and review of the MOA hydrography geodatabase (HGDB; MOA 2020a)[3] showed that no new outfalls have been constructed within these watersheds since those previous investigations; thus the Ship Creek watershed was selected for investigation in 2020. Outfalls in the Eagle River, Hood Creek, and Ship Creek watersheds were screened in 2020. 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 sampled within the watersheds:

1. The DWS program will only evaluate samples from outfalls that both: 1) fit the definition of an outfall provided at 40 CFR 122.26(b)(9),[4] and 2) are owned by the MOA or ADOT&PF. Outfalls fitting these criteria will be preliminarily identified from the HGDB. 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 during the previous year that involve discharges into or from the MS4 will be consulted to identify any associated outfalls for potential sampling (MOA 2018b).
3. Each of the three watersheds selected for investigation 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.

[3] As of 2017, MOA WMS updates the HGDB weekly. The most current version of the HGDB is available for download at http://anchoragestormwater.com/datalibrary.html. HDR downloaded the HGDB prior to reconnaissance activities on May 15, 2020 and following completion of sampling activities on August 10, 2020.

[4] “Outfall means a point source as identified by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.”

5. Unresolved complaint sites will have the highest priority for sampling, then sampling will begin at the furthest downstream outfall identified for sampling.

Prior to the 2020 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 targeted sites identified during the GIS review of the HGDB to ensure the outfalls were otherwise suitable for sampling (safe legal access, flowing water during dry weather conditions, etc.). Outfalls in the watersheds targeted in 2020 were sampled previously during the current permit cycle; Eagle River in 2017, Hood Creek in 2018, and Ship Creek in 2016 and 2018. Outfalls that were not included in the 2016, 2017, and 2018 programs were prioritized for reconnaissance and sampling in 2020. Using these procedures, 15 outfalls within the Eagle River, Hood Creek, and Ship Creek watersheds were selected for sampling in 2020. To evenly distribute the sampled outfalls, five outfalls in each watershed were sampled.

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, may 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 logbooks (Appendix B).

The 2020 reconnaissance trips focused on investigating outfalls in the targeted watersheds that have not been examined under previous years' programs, and reexamining outfalls that had previously exceeded parameters or been flagged for sampling due to poor outfall condition. In addition to the 15 outfalls selected for sampling in 2020, field teams investigated an additional 26 outfalls during reconnaissance trips. Of these, 20 were considered suitable alternate sites for the 2020 program (9 outfalls in Eagle River, 2 outfalls in Hood Creek, and 9 outfalls in Ship Creek). The remaining 6 were not considered suitable alternatives to sample due to access constraints, significant backwater flow into the outfall, or inability to locate the outfall. Previous investigations in the targeted watersheds have identified additional outfalls that are suitable alternates for sampling. These outfalls are identified in previous years' reports (MOA 2016b, 2017, 2018).

Table 2 lists the outfalls sampled in 2020. Outfall codes are numbers assigned to all network 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.

Table 2. Outfalls Sampled During 2020 DWS Program

Outfall Code	Latitude	Longitude	Location Description and Condition Notes
Eagle River			
Eagle River Mainstream			
1335-1	61.29962	-149.54226	North bank, at pedestrian tunnel below Eagle River Loop Rd. Outfall in concrete headwall, discharges to flow path constructed with rock gabions. Outfall and flow path in good condition. Urban debris within grate
303-1	61.29799	-149.53482	North bank, outfall is along trail south of Little Cape Cir. EOP is located at terminus of mapped closed conveyances and flow path conveys discharge to west (not to south as mapped in HGDB). Outfall in good condition with high flow that cascades down rocks into flow path.
Meadow Creek			
646-71	61.31722	-149.55441	South bank, west of Chain of Rock St. Outfall is approximately 150 feet farther downstream than shown on HGDB and is in good condition. Outfall flows directly into creek and is perched above creek's normal water elevation.
1375-99 [a]	61.31725	-149.55415	North bank, west of Chain of Rock St. Unnamed outfall, with high flow, discharging into Meadow Creek. No outfall or connected network shown on HGDB (as of May 15, 2020), HDR assigned temporary ID in 2013. No evidence of network observed up Chain of Rock St. to Kahiltna Dr. Outfall is in good condition, slightly perched above creek.
Eagle River Loop Creek			
1389-1 [b]	61.33264	-149.58370	West side of the Glenn Highway at approximately milepost 14.5. Collects drainage along highway and flows into Joint Base Elmendorf-Richardson (JBER). Flows west within an open half-pipe.
Hood Creek			
609-218	61.19768	-149.95935	East bank, north of Clay Products Dr. Steady flow. Good condition. Some organic and urban debris caught in grate.
486-1	61.19681	-149.96610	North of Nathaniel Ct. Discharges into flow channel through Earthquake Park to Cook Inlet. Steady flow. Good condition.
249-1	61.19187	-149.96831	West side of Jones Lake, from dead end of Wendy's Way. Trickle flow during sampling. Outfall is in good condition other than being partially filled with sediment.
502-16	61.20246	-149.95034	North of Marston Dr. approximately 400 feet west of Lynn Ary Park. Low flow. Outfall discharges into flow channel with a cross culvert below the Tony Knowles Coastal Trail, and flows to Cook Inlet.
1264-37	61.20462	-149.94261	North of the Coastal Trail approximately 800 feet east of Lynn Ary Park. Steady flow. Needs maintenance, bottom of pipe is eroded at the tide line.
Ship Creek			
396-2	61.22379	-149.88500	North bank, south of E. Whitney Rd. below A St. Bridge. Two outfalls, west outfall is 396-2. Steady flow. Good condition.
396-1	61.22374	-149.88493	North bank, south of E. Whitney Rd. below A St. Bridge. Two outfalls, east outfall is 396-1. Steady flow. Good condition.
491-1	61.22328	-149.87577	South bank at Eagle St. Outfall flows into naturalized channel to creek.
96-2	61.22458	-149.84559	South bank at N. Sitka St. EOP perched about 6 feet with a scour pool below. Flow path to creek is naturalized, no obstructions.

Outfall Code	Latitude	Longitude	Location Description and Condition Notes
245-1	61.22775	-149.83301	North bank at Yakutat St. EOP has an overhang and is covered in vegetation and woody debris. Some sand in pipe and flow path but otherwise good condition.

Note: EOP = end of pipe

[a] Outfall 1375-99 is identified as ER #34 on the field forms in Appendix C and the lab reports in Appendix E.

[b] Outfall 1389-1 is identified as ER 1336-1 on the field forms in Appendix C and the lab reports in Appendix E.

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 2012a). Thresholds are established at concentrations sufficiently different from authorized discharges 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 stormwater 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.

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

Parameter	Method	Sensitivity	Reporting Range	Threshold
Turbidity	Hach 2100P Turbidimeter, EPA method 180.1 Rev 2.0M	0.01 for 0 - 9.99 NTU 0.1 for 1 - 10 NTU 1 for 100 - 1000 NTU	0.1 - 1,000 NTU	≥ 250 NTU
Fecal Coliform	SM 9222D	1 colony/100 mL	1 colony/100 mL – too numerous to count	≥ 400 colonies/100 mL
Hach Stormwater Test Kit, Model SW-1 #2481300				
pH	Hach Pocket Pro pH Tester, ion selective electrode, EPA method 150.1	0.1 units	0 - 14 STD	≤ 4 or ≥ 9 STD
Total Chlorine	Hach Method 8167[a], DPD/Color Disc, SM 4500-Cl G	0.1 mg/L	0 – 3.4 mg/L	≥ 1.0 mg/L
Detergents	Hach Model DE-2, Toluidine Blue-O Chloroform/Color Disc	0.05 mg/L	0 – 1.2 mg/L	≥ 1.0 mg/L
Total Copper	Hach Methods 8506 and 8026[a], Bicinchoninate/Color Disc, SM 3500-Cu C or E	0.1 mg/L	0 – 4.0 mg/L	≥ 1.0 mg/L

Total Phenols	Hach Method 8047[a]: 4-Aminoantipyrine/Color Disc, EPA method 420.1	0.1 mg/L	0 - 5 mg/L	≥ 0.5 mg/L

Note: SM = Standard Method

[a] Test kit uses equivalent or adapted method.

2.4 Sampling Procedures

Sampling procedures were carried out in accordance with the methodology outlined in the QAP, except for minor deviations described in Section 2.4.4.

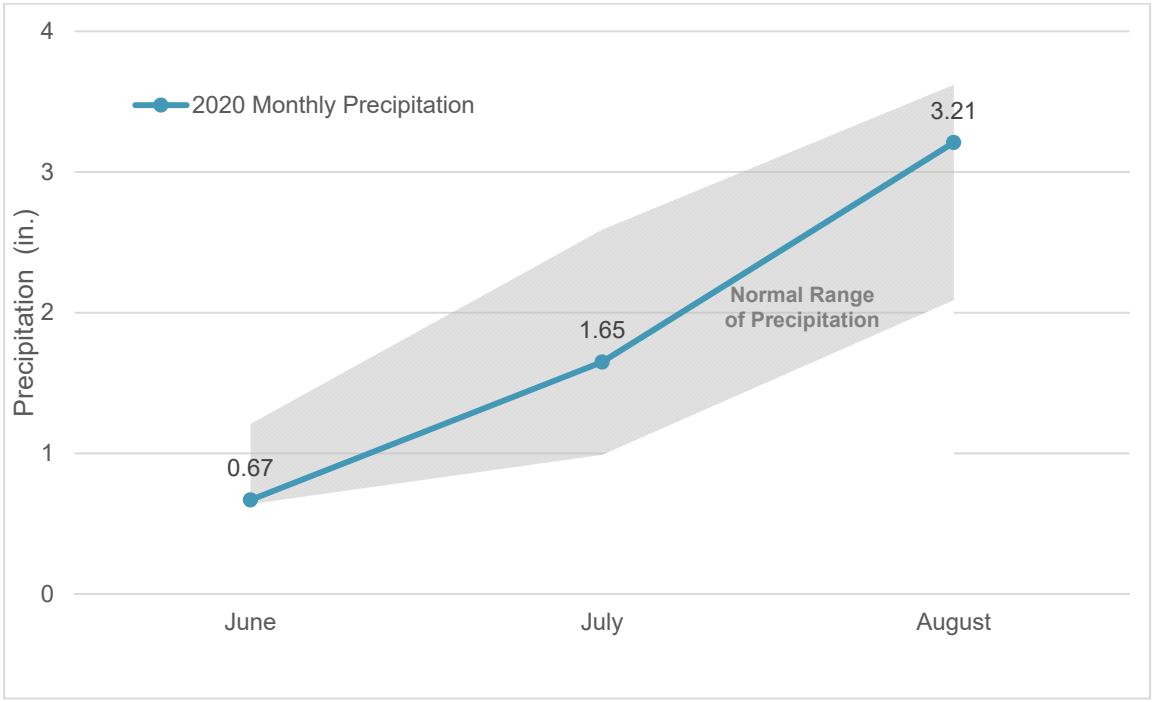
2.4.1 Field Preparation

The MS4 permit stipulates that dry weather screening should be conducted between June 1 and August 30 of each year, following at least 48 hours of dry weather after any storm event that created runoff in the MS4.[5] Unlike summer 2019, the precipitation in the Anchorage area in summer 2020 was normal and not abnormally dry. Monthly precipitation in June through August was within the normal range (Figure 1).

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 2020c). Sampling occurred on two days in June. Figure 2 shows the daily precipitation and 48 hour running total precipitation for summer 2020. The dates when sampling occurred are indicated by the black arrows.

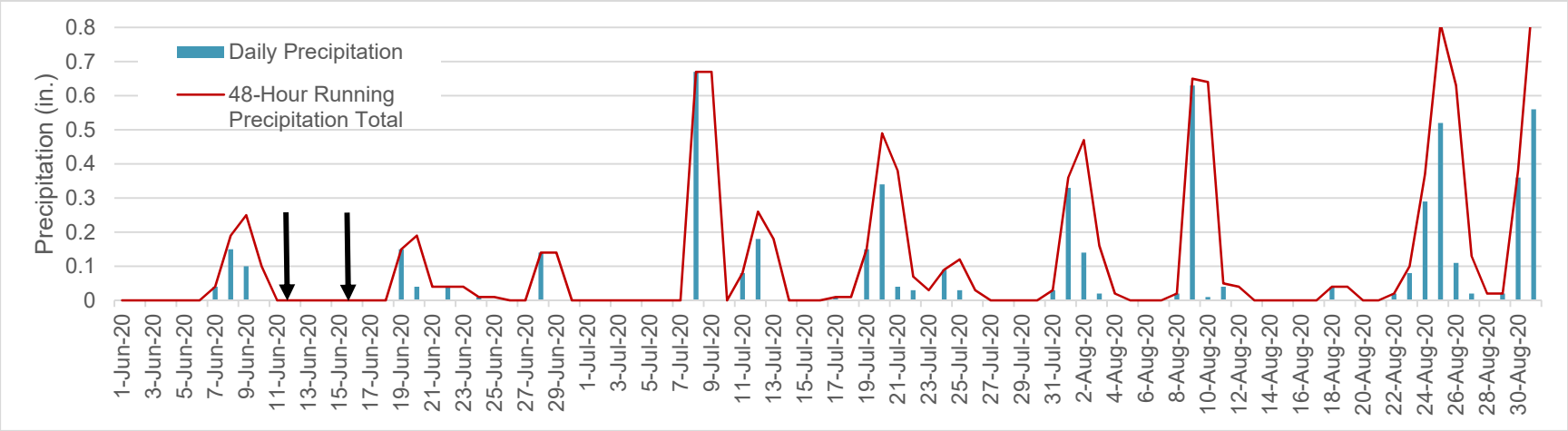
[5] Precipitation greater than 0.1 inches typically generates runoff.

Figure 1. Monthly Precipitation in Anchorage, Summer 2020



Notes: 2020 monthly precipitation data recorded at Ted Stevens International Airport. Source: NWS 2020b. 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.

Figure 2. Daily Precipitation in Anchorage, Summer 2020



Notes: Daily precipitation data recorded at Ted Stevens International Airport. Source: NWS 2020c.
Black arrows indicate sampling dates.

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
- Hach Pocket Pro pH tester
- pH test strips
- Hach water quality field test kits
- Laboratory-supplied fecal coliform bottles
- Hach turbidimeter
- 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

The QAP outlines notification procedures and follow-up activities to be performed when a sample exceeds the program threshold for any parameter (MOA 2016a). As an additional

measure, 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 24 hours), and HDR provided these results to the MOA WMS.

Samples from one outfall, 396-1 to Ship Creek, exceeded the threshold for fecal coliform in 2020. Per the QAP, HDR notified the MOA WMS of the exceedances as soon as the results were available from SGS, and field team collected follow-up samples for fecal coliform analysis on the next suitable day for sampling. The follow-up samples also exceeded the threshold, and once again HDR notified the MOA WMS of the exceedances as soon as the results were available. WMS conducted additional follow-up investigations at outfall 396-1 to Ship Creek (see Section 4.1 Threshold Exceedances).

2.4.4 Deviations from QAP

The field test kits for total chlorine, detergents, total copper, total copper, and total phenols specified in the DWS methodology in Appendix E of the QAP are no longer commercially available. New test kits for these parameters were obtained for the 2020 season. The new test kits utilize the same or equivalent EPA compliant methods as the kits specified in the QAP. These methods are provided in Table 3.

Appendix E of the QAP specifies that a YSI 556 multiprobe should be used to measure pH. Based on limited equipment availability, a Hach Pocket Pro pH Tester was used to measure pH in 2020. The Hach probe uses an equivalent EPA compliant method to measure pH as that specified in the QAP. The probe was calibrated before the first sampling event and checked against standards before the second sampling event.

2.5 Chain of Custody Records

The field team leader completed a chain of custody record which included each fecal coliform 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 (typically within 24 hours). The expedited turn-around time allows 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 2020 DWS program sampling effort adds to the data set of previous years' sampling efforts (MOA 2008, 2009, 2011, 2012b, 2013, 2014, 2016c, 2016b, 2017, 2018, 2019). The 2020 sample results are provided in Table 4. Complete laboratory analysis reports are provided in Appendix E.

Table 4. Sample Results for Field Parameters and Laboratory Analyses

Watershed	Outfall ID	Date	Flow	pH	Total Chlorine (mg/L)	Detergents (mg/L)	Total Copper (mg/L)	Total Phenols (mg/L)	Turbidity (NTU)	Fecal Coliform (colonies/ 100mL)
Hood Creek	249-1	6/12/2020	Low	6.9	0.4	<0.05	<0.1	<0.1	37.5	10
Hood Creek	486-1	6/12/2020	Low	6.1	<0.1	<0.05	<0.1	<0.1	25.4	ND
				R = 6.1	R = 0.1	R <0.05	R <0.1	R <0.1	R = 25.4	R = ND
Hood Creek	502-16	6/12/2020	Low	7.8	0.2	0.1	<0.1	<0.1	0.28	ND
Hood Creek	609-218	6/12/2020	Medium	7.5	0.4	<0.05	<0.1	<0.1	0.91	ND
Hood Creek	1264-37	6/12/2020	Medium	7.5	0.2	<0.05	<0.1	<0.1	0.45	ND
Ship Creek	96-2	6/12/2020	High	7.4	<0.1	0.1	<0.1	<0.1	0.54	ND
				R = 7.4	R <0.1	R <0.1	R <0.1	R <0.1	R = 0.65	R = 3.3
Ship Creek	245-1	6/12/2020	High	7.9	0.1	<0.05	<0.1	<0.1	0.34	ND
Ship Creek	396-1	6/12/2020	Medium	7.6	0.2	0.1	<0.1	<0.1	2.03	**885**
		6/16/2020		Re = 7.7	-	-	-	-	-	**Re = 1020**
Ship Creek	396-2	6/12/2020	Medium	7.1	<0.1	<0.05	<0.1	<0.1	0.66	ND
Ship Creek	491-1	6/12/2020	Low	7.7	<0.1	0.1	<0.1	<0.1	2.42	12
Eagle River	1375-99 [a]	6/16/2020	Medium	7.3	0.2	<0.05	<0.1	<0.1	0.55	ND
Eagle River	303-1	6/16/2020	Medium	8.3	0.2	<0.05	<0.1	<0.1	0.56	ND
Eagle River	646-71	6/16/2020	Medium	7.9	<0.1	<0.05	<0.1	0.1	0.52	ND
Eagle River	1335-1	6/16/2020	Medium	8.3	0.2	<0.05	<0.1	<0.1	1.83	32
				R = 8.3	R = <0.1	R <0.05	R <0.1	R <0.1	R = 1.85	R = 30
Eagle River	1389-1 [b]	6/16/2020	Medium	8.3	0.2	<0.05	<0.1	<0.1	2.36	4.0

Notes: R = replicate sample; Re = Resample; ND = not detectable
Bold results are exceedances.

[a] Outfall 1375-99 is identified as ER #34 on the field forms in Appendix C and the lab reports in Appendix E.

[b] Outfall 1389-1 is identified as ER 1336-1 on the field forms in Appendix C and the lab reports in Appendix E.

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. The QA/QC Contract Officer conducted a

half-day field audit on June 12 to observe the field team collect samples and conduct field test kits and found no correctible actions.

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 (EOP) 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. 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 between the primary and replicate samples be within 60%. For turbidity, the QAP requires that the absolute difference between the primary and replicate samples be within 1 NTU. The variance between the primary and replicate samples are presented in Table 5.

Table 5. Replicate Sample Variance from Primary Sample

Parameter	QAP standard	Ship Creek 96-2	Eagle River 1335-1	Hood Creek 486-1
pH	± 0.2 pH units	0 pH units	0 pH units	0 pH units
Total Chlorine	30%	-	[a]	[a]
Detergents	30%	[a]	-	-
Total Phenols	30%	-	-	-
Turbidity	± 1 NTU	0.11 NTU	0.02 NTU	0 NTU
Total Copper	30%	-	-	-
Fecal Coliform	60%	[a]	6%	-

Note: **Bold** values indicate replicate variance that exceeds the QAP standard.
'-' indicates that both the primary and replicate samples were below the method detection limit.
[a] Either the primary or replicate sample was not detected at or above the method detection limit.

All of the results fall within the QAP standards. At all three locations, for at least one parameter either the primary or replicate sample was below the method detection limit and the other sample was recorded as a detectable concentration. These measurements are noted in Table 5. Relative percent difference cannot be calculated for these samples. For all these samples the

recordable concentration was at or just above the method detection limit, and well below the threshold for the respective parameter. Variability in measurements can be expected due to the heterogeneous nature of stormwater flow.

Sample custody was adequately maintained for the samples. The coolers transporting the fecal coliform samples were chilled with gel ice to maintain 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, 2020 at outfall 396-1 to Ship Creek was 885 colonies/100mL, an exceedance of the program threshold of 400 colonies/100mL. Outfall 396-1 is located on the north bank of Ship Creek below the A Street Bridge and conveys drainage from land primarily owned by the Alaska Railroad Corporation. SGS transmitted the preliminary results of the fecal coliform analysis to HDR on June 15. Per the QAP, a follow-up sample for fecal coliform analysis was collected on the next suitable day, June 16. The result of the fecal coliform analysis of the follow-up sample was 1,020 colonies/100mL.

In response to the exceedances at outfall 396-1, MOA WMS performed two follow-up visits on August 7 and October 8 to determine whether the bacteria detected during sampling were due to an illicit discharge. The investigations, conducted during dry weather periods, looked at the drainage area to the outfall and collected samples from three locations where flows were observed. On October 8 the fecal coliform level at outfall 396-1 was 30 colonies/100mL, below the program threshold. Fecal coliform was not detected at the other two sample locations. Investigators believed the earlier exceedances were likely due to bacterial growth on sandbags behind the outfall grate, which were placed in the storm sewer as a sediment control measure. The sandbags will be removed and the outfall will be resampled under the 2021 DWS program. The follow-up report is included in Appendix F.

No other parameter at any outfall exceeded the assigned threshold. All 15 of the outfalls sampled in 2020 have been previously sampled under the MOA WMS DWS program. Table 6 summarizes the results of previous years' sampling at these outfalls.

Table 6. Summary of Previous Sampling

Watershed	Outfall Number	Year Sampled	Sampling Results and Notes
Ship Creek	96-2	2012, 2016	No exceedances.
Ship Creek	245-1	2012	No exceedances.
Ship Creek	396-1	2015, 2018	No exceedances.
Ship Creek	396-2-1	2018	No exceedances.
Ship Creek	491-1	2014, 2016	No exceedances.
Eagle River	1375-99 (#34)	2014, 2017	No exceedances.

Watershed	Outfall Number	Year Sampled	Sampling Results and Notes
Eagle River	303-1	2011, 2017	No exceedances.
Eagle River	646-71	2014, 2017	No exceedances.
Eagle River	1335-1	2011, 2017	Exceedance of fecal coliform in 2017. No exceedance in resample and no further action required.
Eagle River	1336-1	2011, 2017	No exceedances.
Hood Creek	249-1	2018	No exceedances.
Hood Creek	486-1	2018	No exceedances.
Hood Creek	502-16	2018	No exceedances.
Hood Creek	609-218	2013, 2018	No exceedances.
Hood Creek	1264-37	2018	No exceedances.

Illicit discharge reports received by MOA in 2019 and 2020 (through May 20, 2020) did not include unresolved complaint sites within targeted watersheds. Sampling was therefore not targeted for known illicit discharges complaints.

4.2 Observations from Reconnaissance Trips

During reconnaissance trips prior to sampling, 41 outfalls to Ship Creek, Eagle River, and Hood Creek were investigated. Of these, 1 could not be located and an additional 5 were determined to be not suitable for sampling. Reasons that outfalls were deemed not suitable include that the network connected to the outfall conveys both stormwater and a segment of piped creek; that the outfall is significantly damaged or submerged; and/or that access is 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 7. All outfalls investigated in 2020 are listed in Appendix B.

Table 7. Damaged, Clogged and Submerged Outfalls

Watershed	Outfall Number	Type of Issue	Notes
Ship Creek	154-1	Could Not Locate	Could not locate EOP at location shown in HGDB.
Ship Creek	119-1	Damaged	Corroded holes in the bottom of the exposed EOP. Visible embedded pipe is possibly partially crushed.
Ship Creek	1363-1	Damaged	Concrete encasement has crushed some of the pipe.
Hood Creek	1264-37	Damaged	Long exposed pipe with corrosion in bottom of pipe. Stormwater flows out corrosion approximately 15 feet up from EOP.
Eagle River	541-1	Submerged	Backwatered, cannot sample.
Eagle River	751-2	Obstructed	Grate is clogged with debris.
Eagle River	1390-2	Infiltration	Stormwater flow can be heard in culvert and in inlets along street but outfall has no flow. Possible ground infiltration from damaged culvert.

Note: EOP = end of pipe

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 dry weather screening, as well as any other MS4 permit compliance activities, can be conducted in the future. These areas include:

4.2.1 Eagle River

- On the corner of Sanctuary Dr. and Kantishna Dr., the HGDB shows a closed conveyance draining to an open conveyance that flows east along Kantishna Dr. No EOP was found during reconnaissance and all stormwater connections appear to be underground with inlet openings at the road surface. The HGDB should be reviewed in this location.
- The location shown for outfall 1375-1 is incorrect. The HGDB shows the location of the outfall at the inlet of the culvert where Meadow Creek crosses under Eagle River Road. The EOP for the connected network is located approximately 575 feet upstream, on the west side of Old Eagle River Road.
- The flowpath from outfall 303-1 to Eagle River is incorrectly mapped. The EOP for the connected network is located at node ID 303-2, and discharges to the west down a steep slope before entering Eagle River approximately 800 feet downstream.
- Multiple EOPs were located during reconnaissance that are not mapped as outfalls in the HGDB. Many of these discharge directly into Eagle River or other connected waterbodies. These outfalls have been assigned temporary ID numbers based on the subbasin in which they are located, or a nearby drainageway. These outfalls should be reviewed and assigned a node ID and drainageway ID that is reflected in the HGDB. The locations of these outfalls are described in Table B-1 of Appendix B.
    - 1147-1
    - 1147-2
    - 1147-3
    - 1375-99
    - 751-1
    - 751-2
    - 1451-2

4.2.2 Ship Creek

- Two outfalls that are not mapped in the HGDB have been assigned temporary ID numbers. These outfalls have been assigned temporary ID numbers based on the subbasin in which they are located, or a nearby drainageway. These outfalls should be reviewed and assigned a node ID and drainageway ID that is reflected in the HGDB. The locations of these outfalls are described in Table B-1 of Appendix B.
    - 396-2 (also identified as 396-1-2 in previous reports)
    - 972-1

4.2.3 Hood Creek

- The drainageway connected to outfall 142-1 was observed to be inaccurately mapped during field reconnaissance. Ongoing construction was noted along Marston Drive nearby. The HGDB should be reviewed in this location for any required updates.

4.3 Future Sampling

The DWS methodology will be revised consistent with the conditions of the MS4 permit effective August 1, 2020, and submitted to ADEC for review and approval prior within six months of the effective date of the permit. The investigations performed under previous years' DWS programs will inform any future sampling activities, such as outfall accessibility and condition, baseline flow (including suspected streamflow and groundwater infiltration), and previous threshold exceedances.

5.0 References

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Appendix A

Watershed Maps

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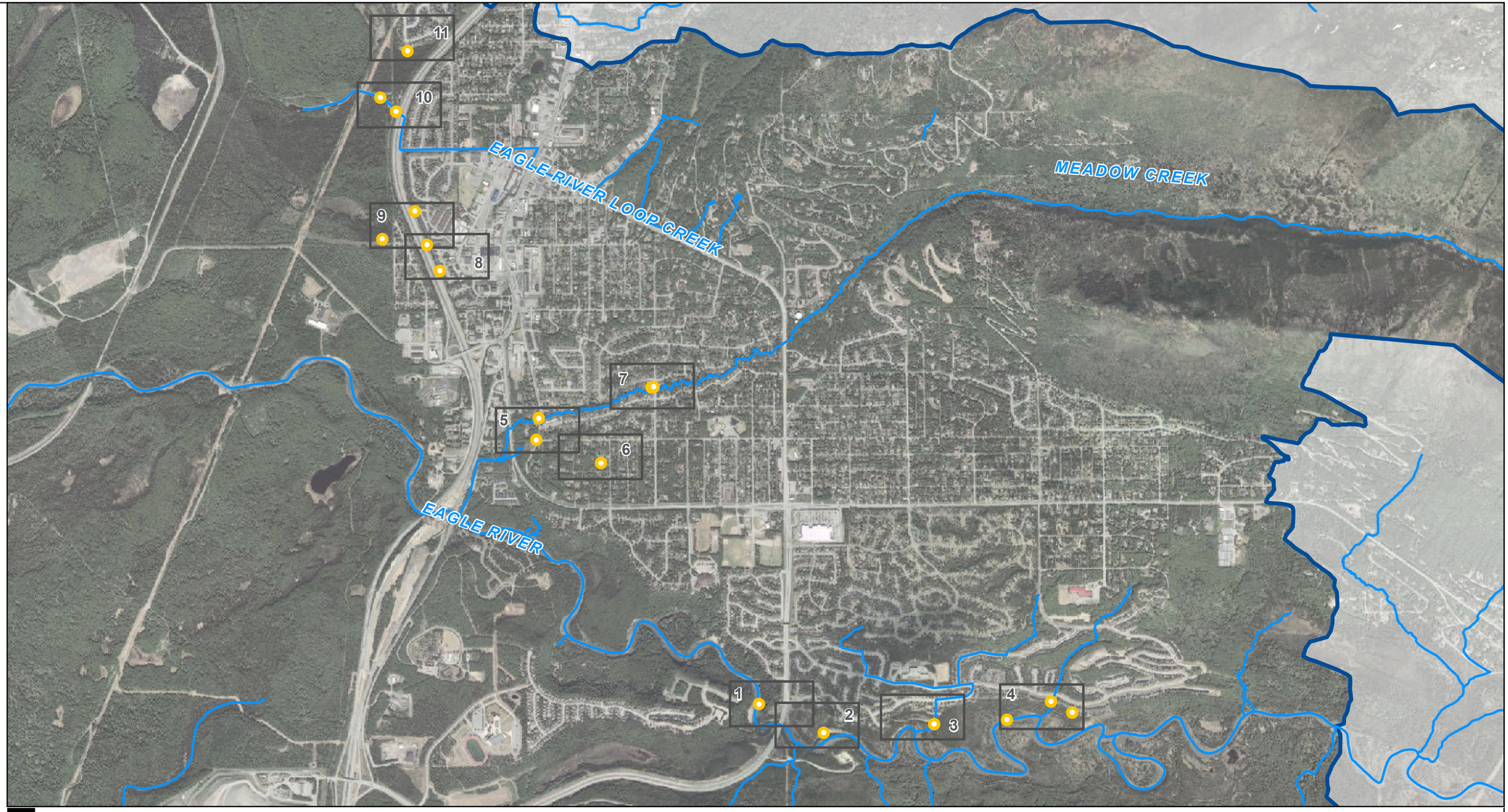
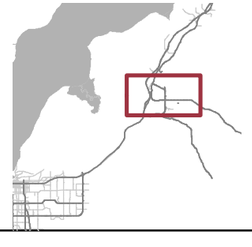


LEGEND

- 2020 Investigated Outfall
- Stream
- Map Page Index
- Watershed Boundary

0 0.25 0.5 0.75 1 1.25 1.5 Mile



Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Map Index

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

LEGEND

2020 Sampled Outfall

Stream

Drainage Ways

Pipe

Routing

Open Channel

Xing Culvert; 2

Drainage Way Nodes

Catch Basin

Catchbasin Manhole

OGS

Outfall Major

0 100 200 Feet

Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 1

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

LEGEND

- 2020 Sampled Outfall
- Stream

Drainage Ways
- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Manhole
- OGS
- Outfall Major

0 100 200 Feet

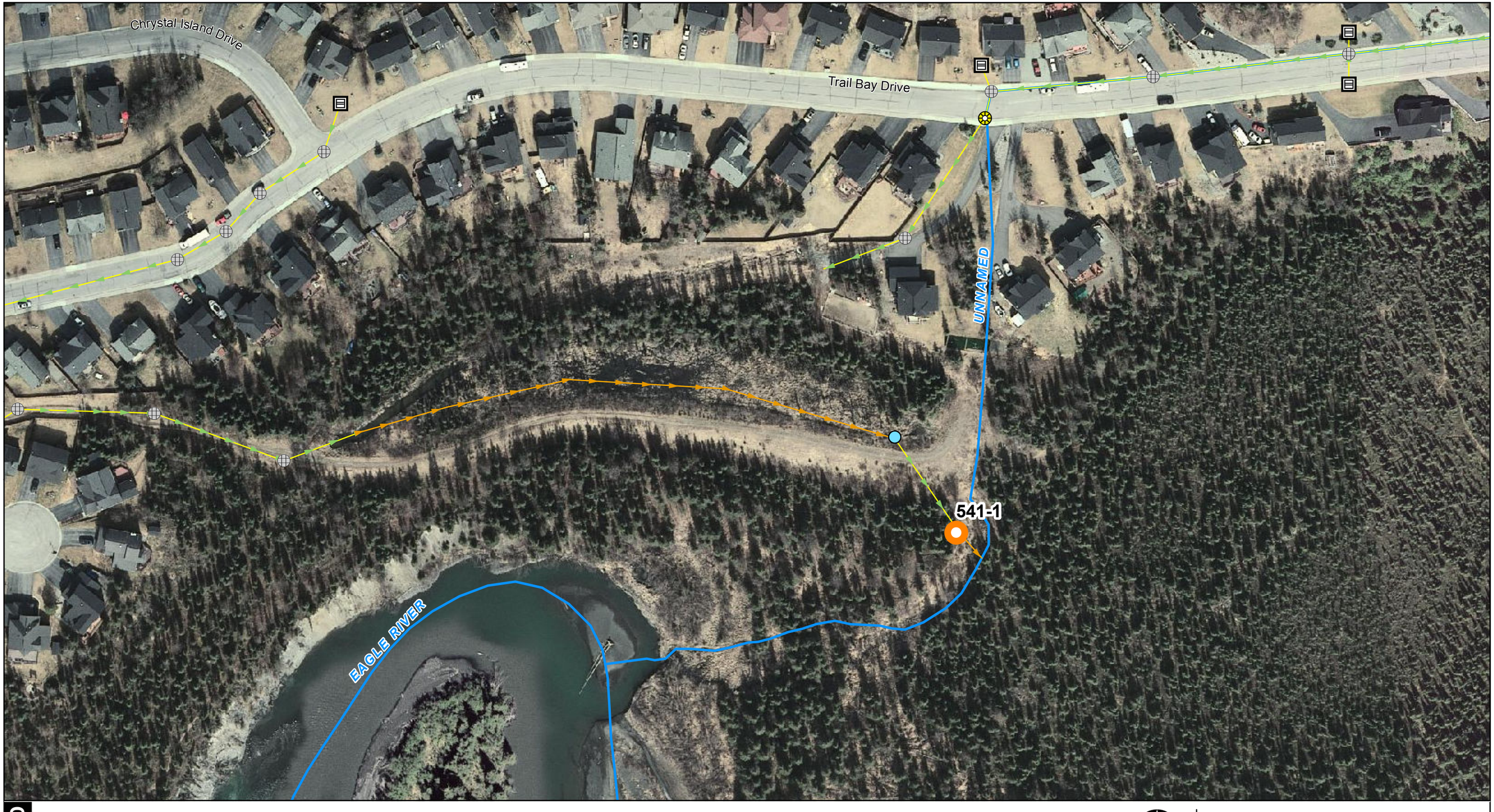
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 2

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Not Suitable

Stream

Drainage Ways

Pipe

Routing

Drainage Way Nodes

Catch Basin

Catchbasin Manhole

Inlet

Manhole

Outfall Major

0 100 200 Feet

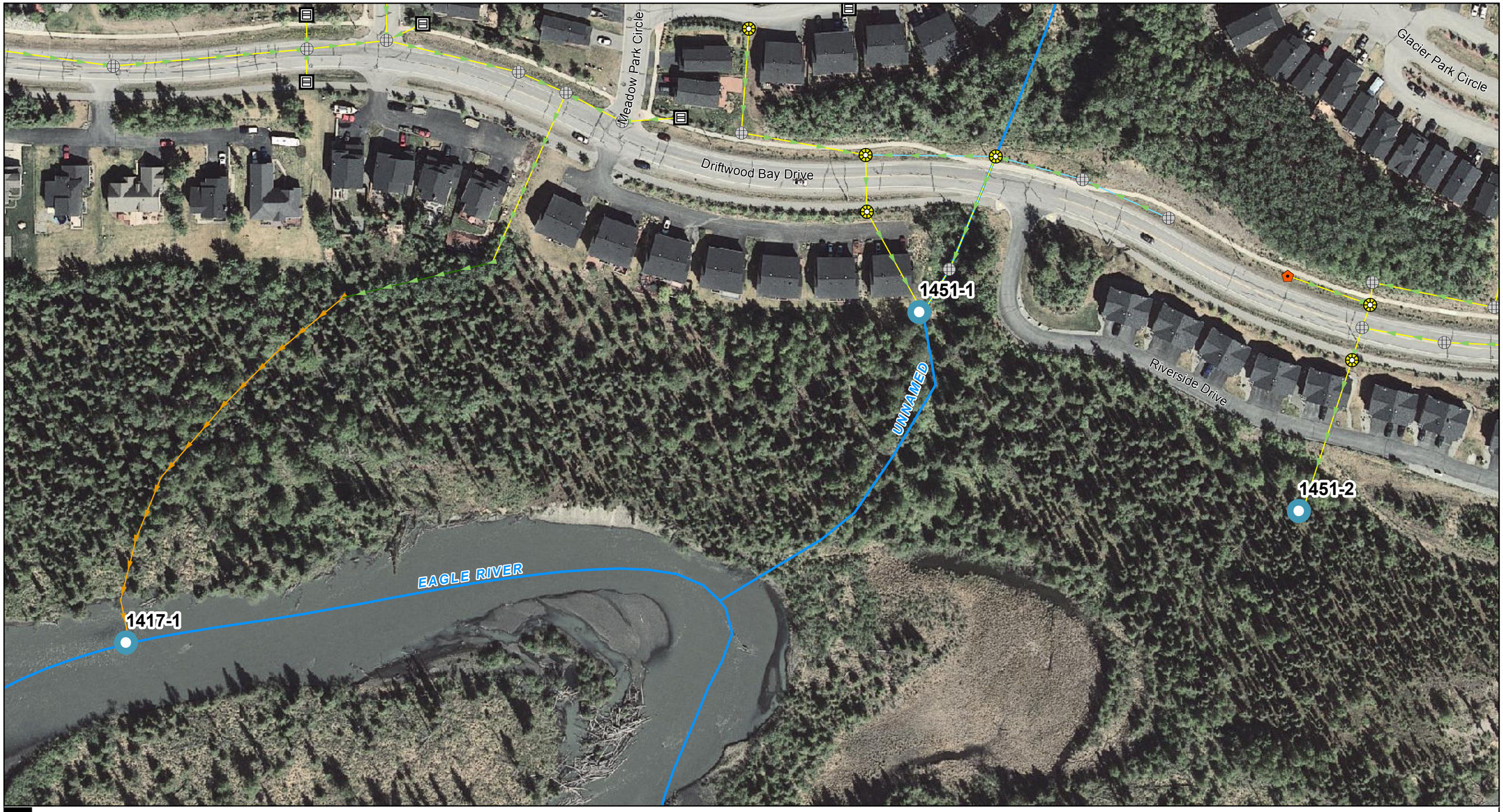
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 3

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Alternate

Stream

Drainage Ways

- Pipe
- Inlet
- Routing
- Open Channel

Drainage Way Nodes

- Catch Basin
- Catchbasin Manhole
- Clean-out
- Manhole
- Outfall Major

0 100 200 Feet

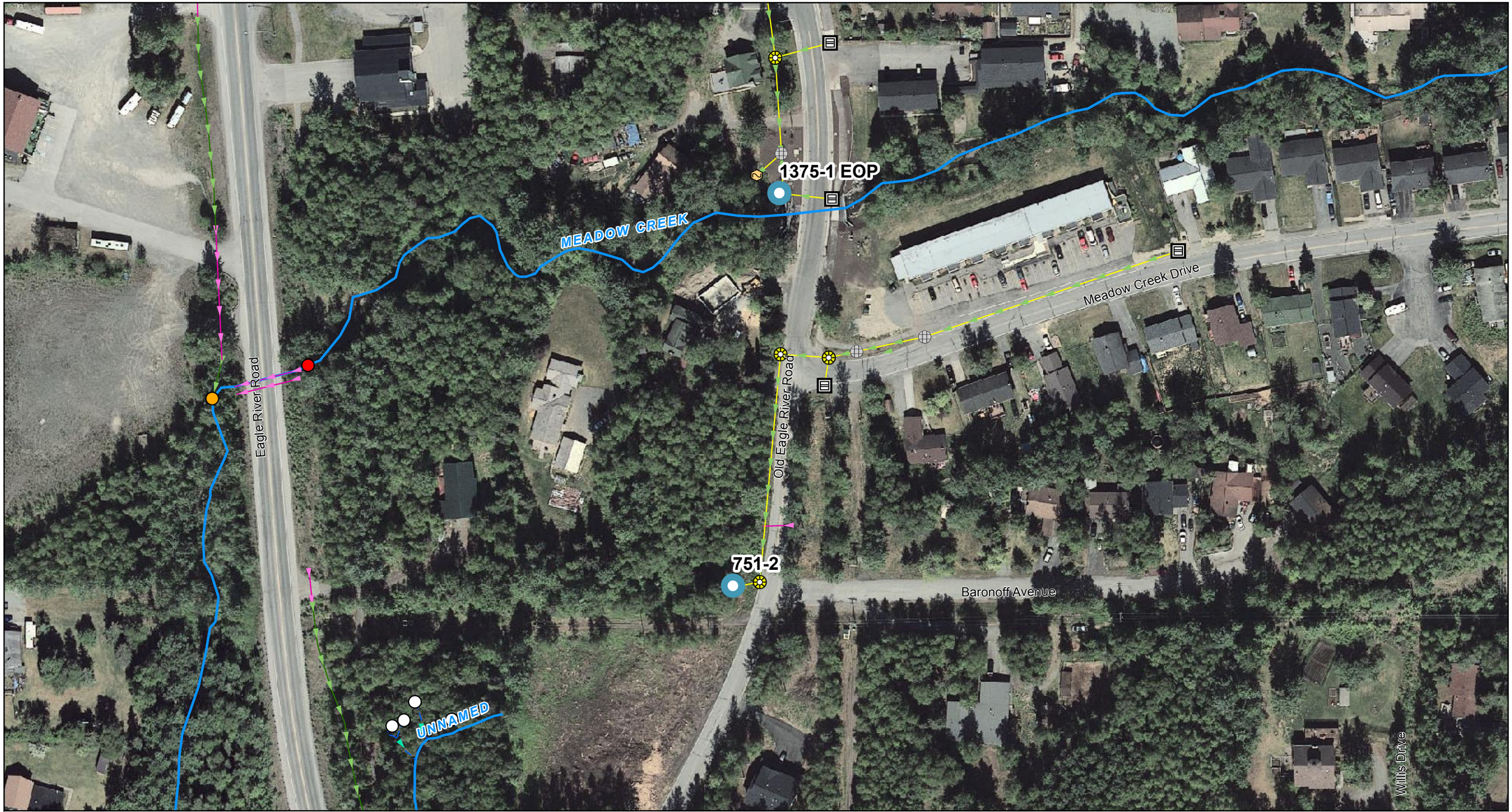
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 4

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Alternate

Stream

Drainage Ways

- Pipe
- Ephemeral Channel
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes

- Catch Basin
- Catchbasin Manhole
- Feature Start
- Manhole
- OGS
- Outfall
- Outfall Major

0 100 200 Feet

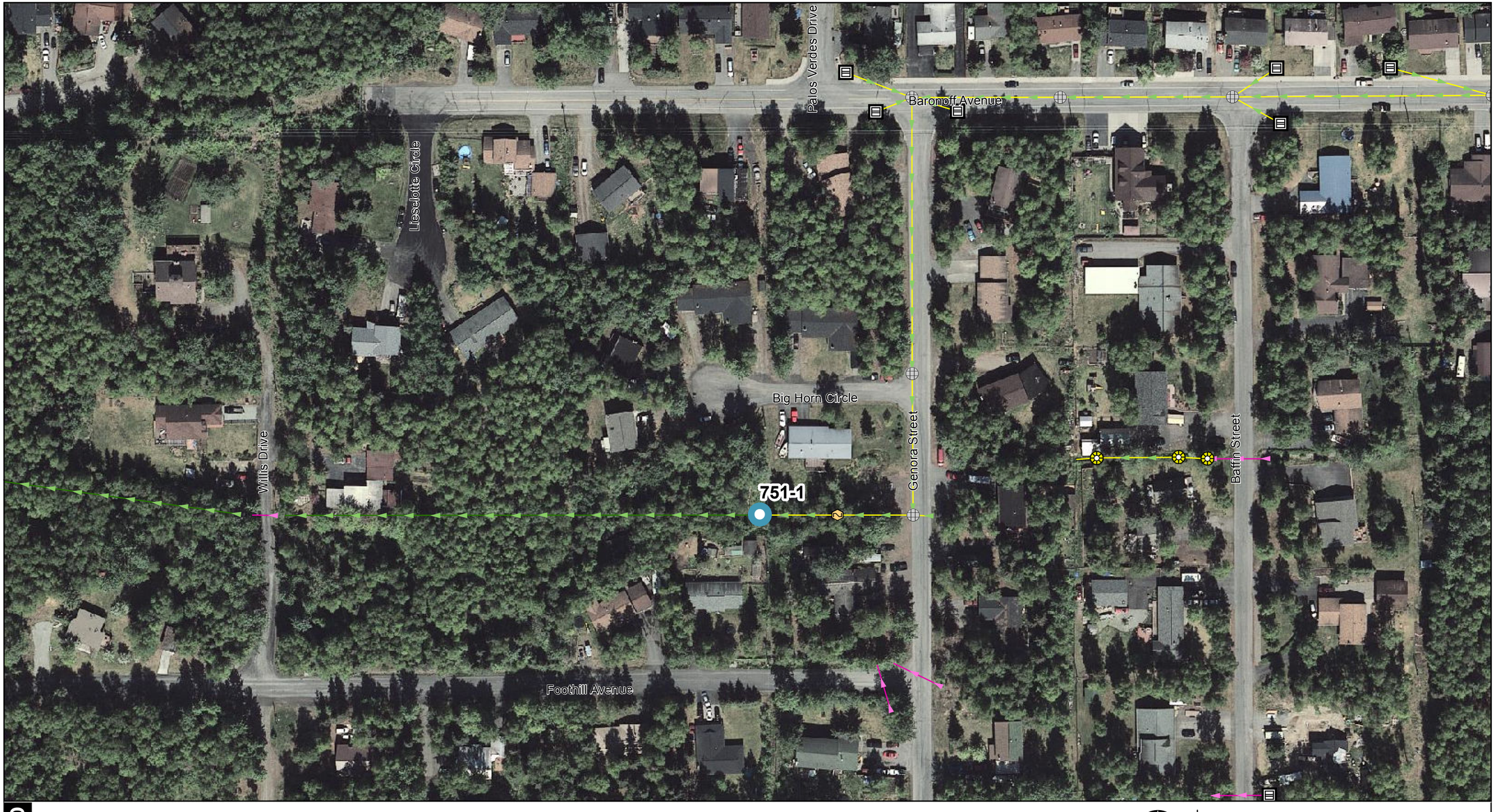
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 5

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Alternate

Drainage Ways
- Pipe
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Manhole
- OGS

0 100 200 Feet

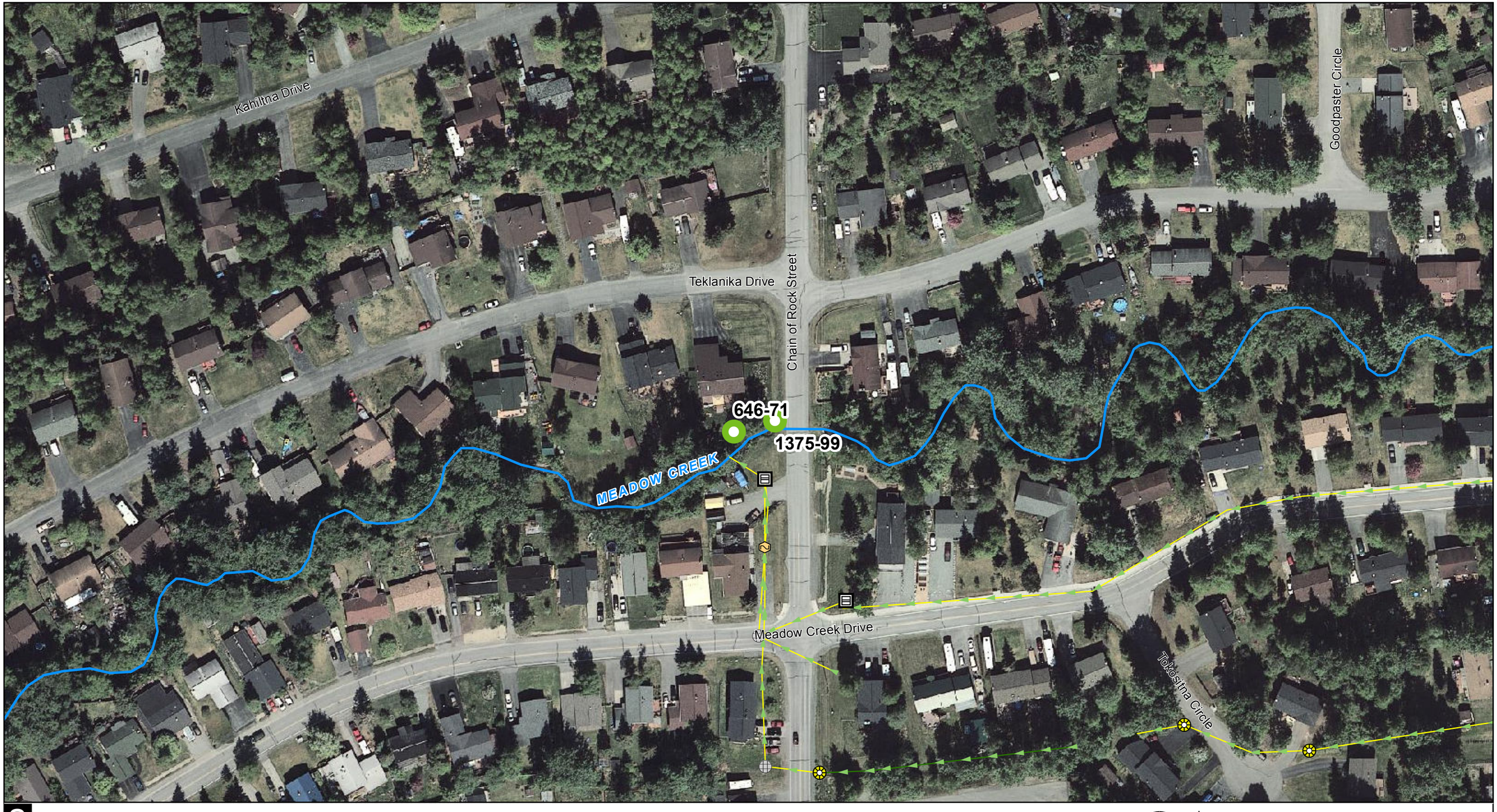
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 6

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Sampled Outfall
- Stream

Drainage Ways
- Pipe
- Open Channel

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Manhole
- OGS
- Outfall

0 100 200 Feet

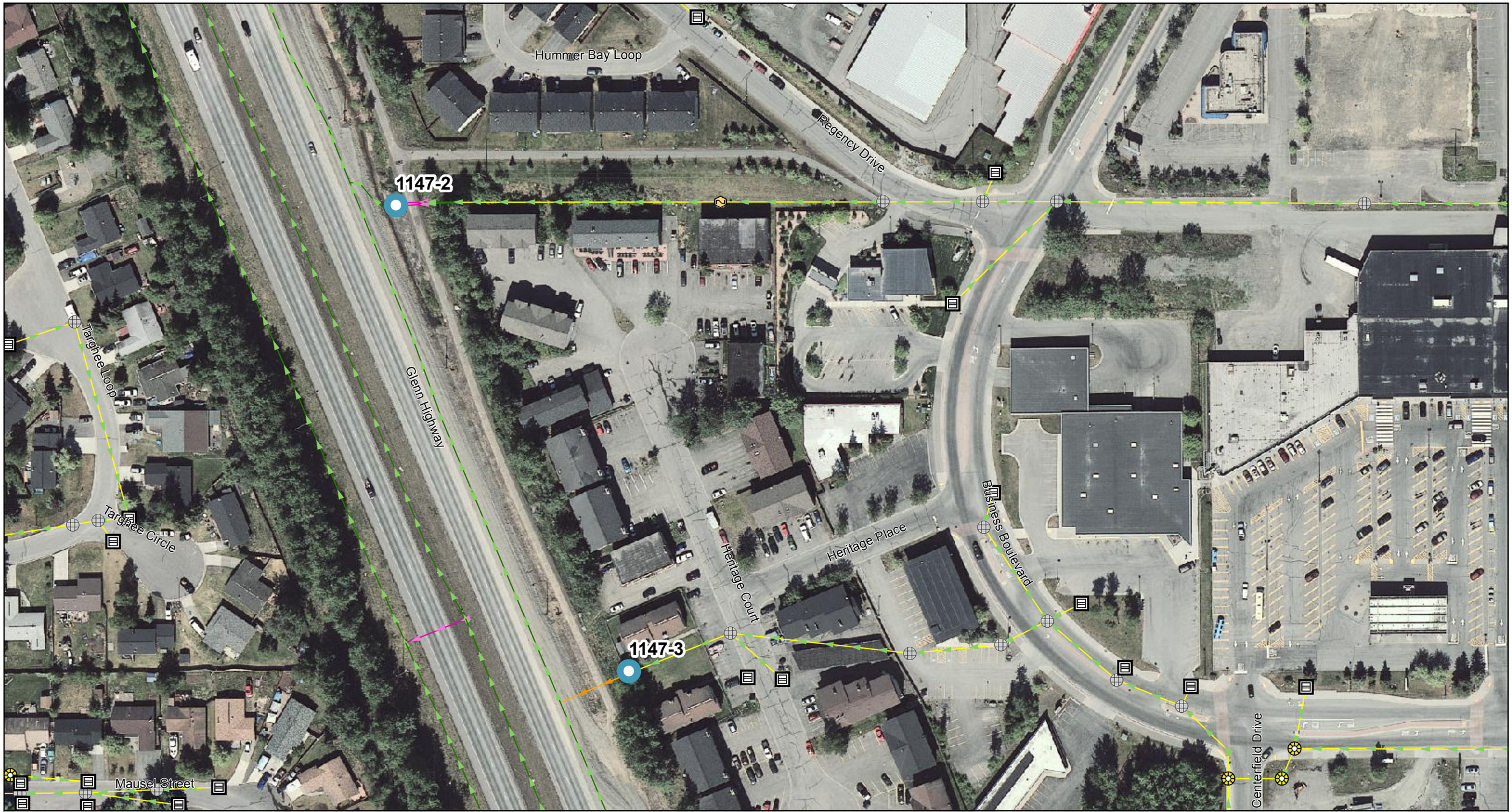
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 7

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Alternate

Drainage Ways
- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Manhole
- OGS

0 100 200 Feet

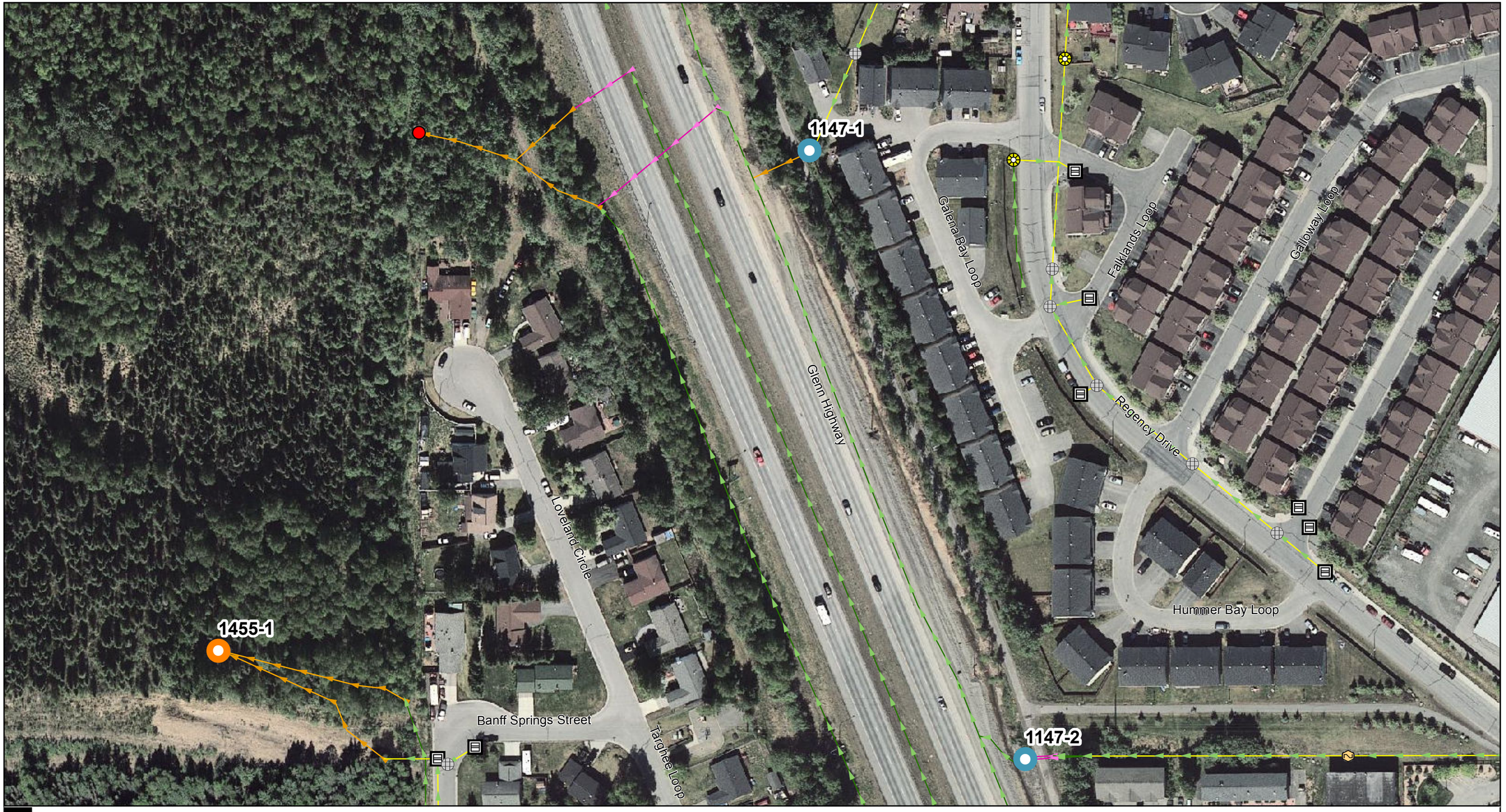
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 8

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Examined Outfall, Alternate
- 2020 Examined Outfall, Not Suitable

Drainage Ways
- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Manhole
- OGS
- Outfall
- Outfall Major

0 100 200 Feet

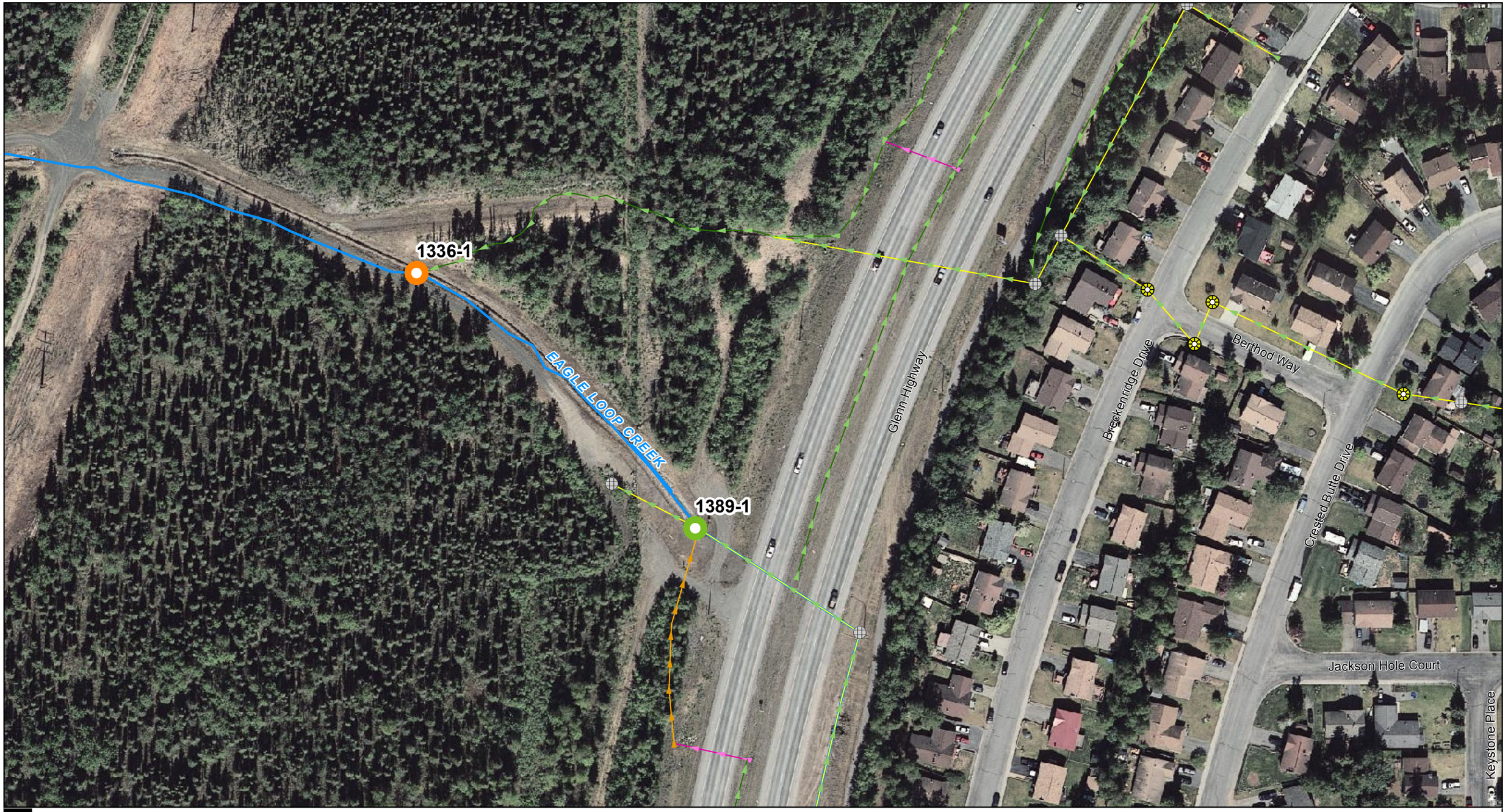
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 9

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Sampled Outfall
- 2020 Examined Outfall, Not Suitable
- Stream

Drainage Ways

- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes

- Catchbasin Manhole
- Manhole
- Outfall
- Outfall Major

0 100 200 Feet

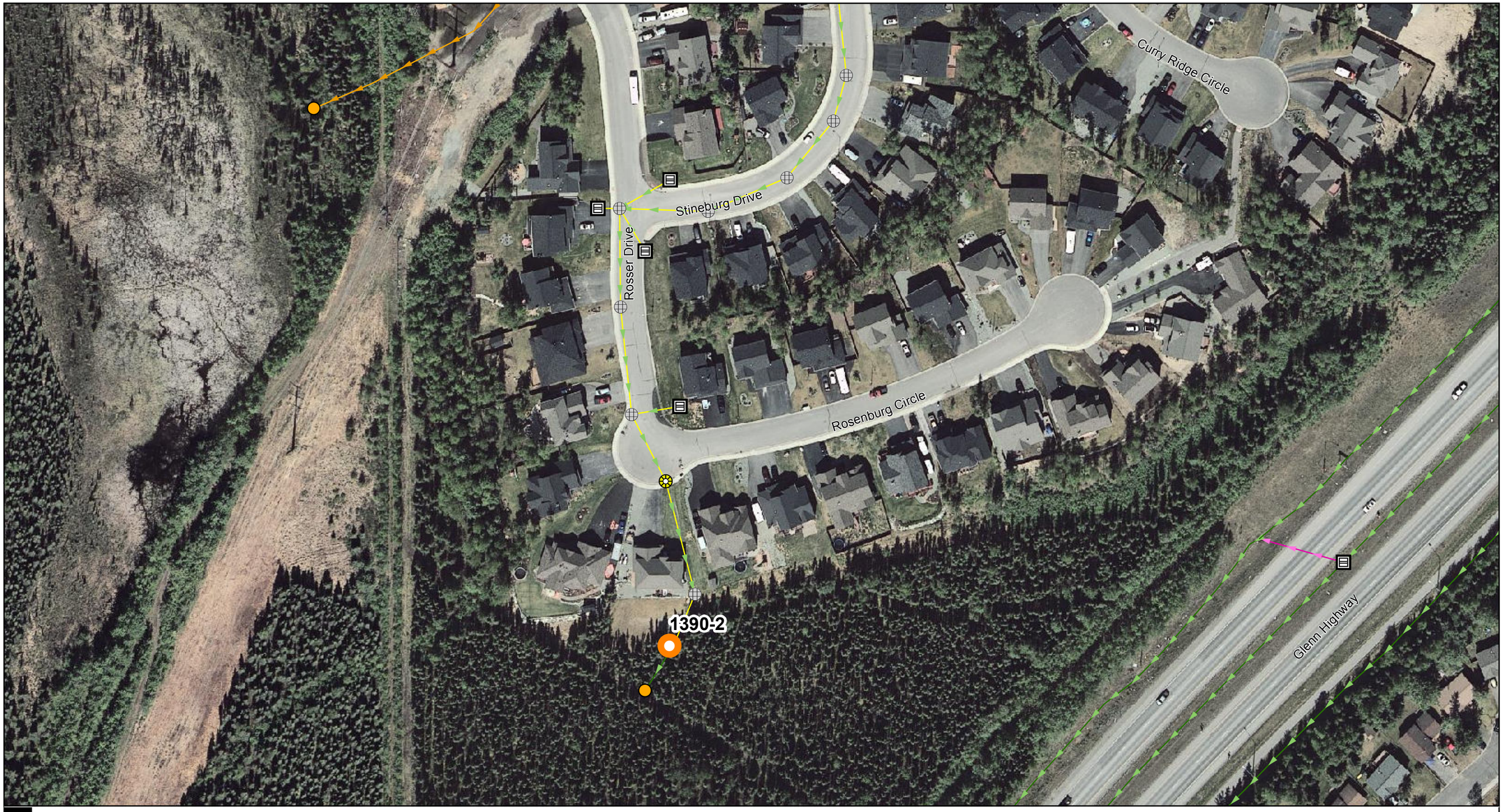
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 10

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Examined Outfall, Not Suitable

Drainage Ways
- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes
- Catch Basin
- Catchbasin Manhole
- Control Outlet
- Manhole
- Outfall

0 100 200 Feet

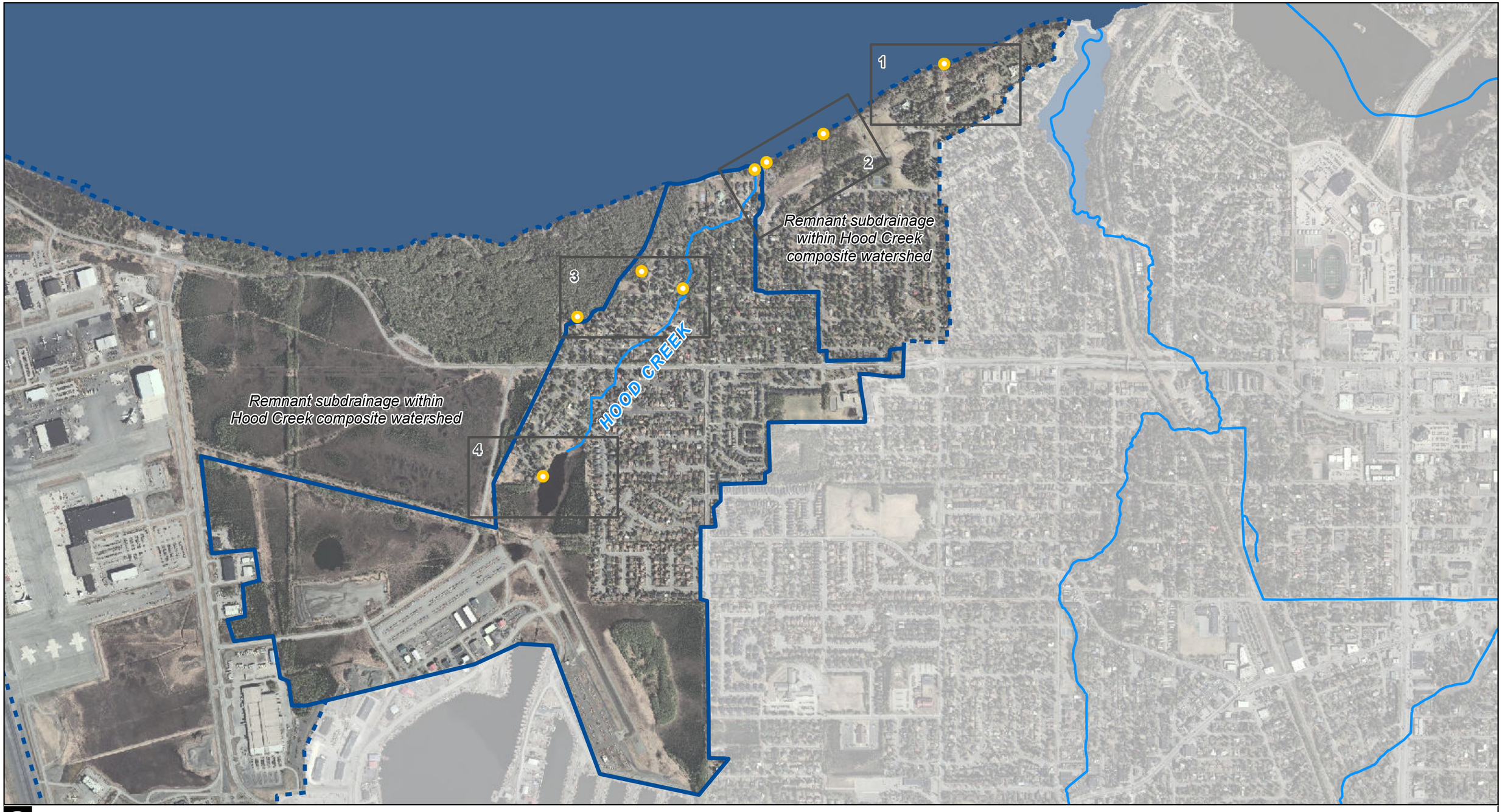
Dry Weather Screening 2020

Eagle River

Examined and Sampled Outfalls

Page 11

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Investigated Outfall
- Stream
- Map Page Index
- Watershed Boundary
- Watershed Remnant

0 0.25 0.5 0.75 Mile

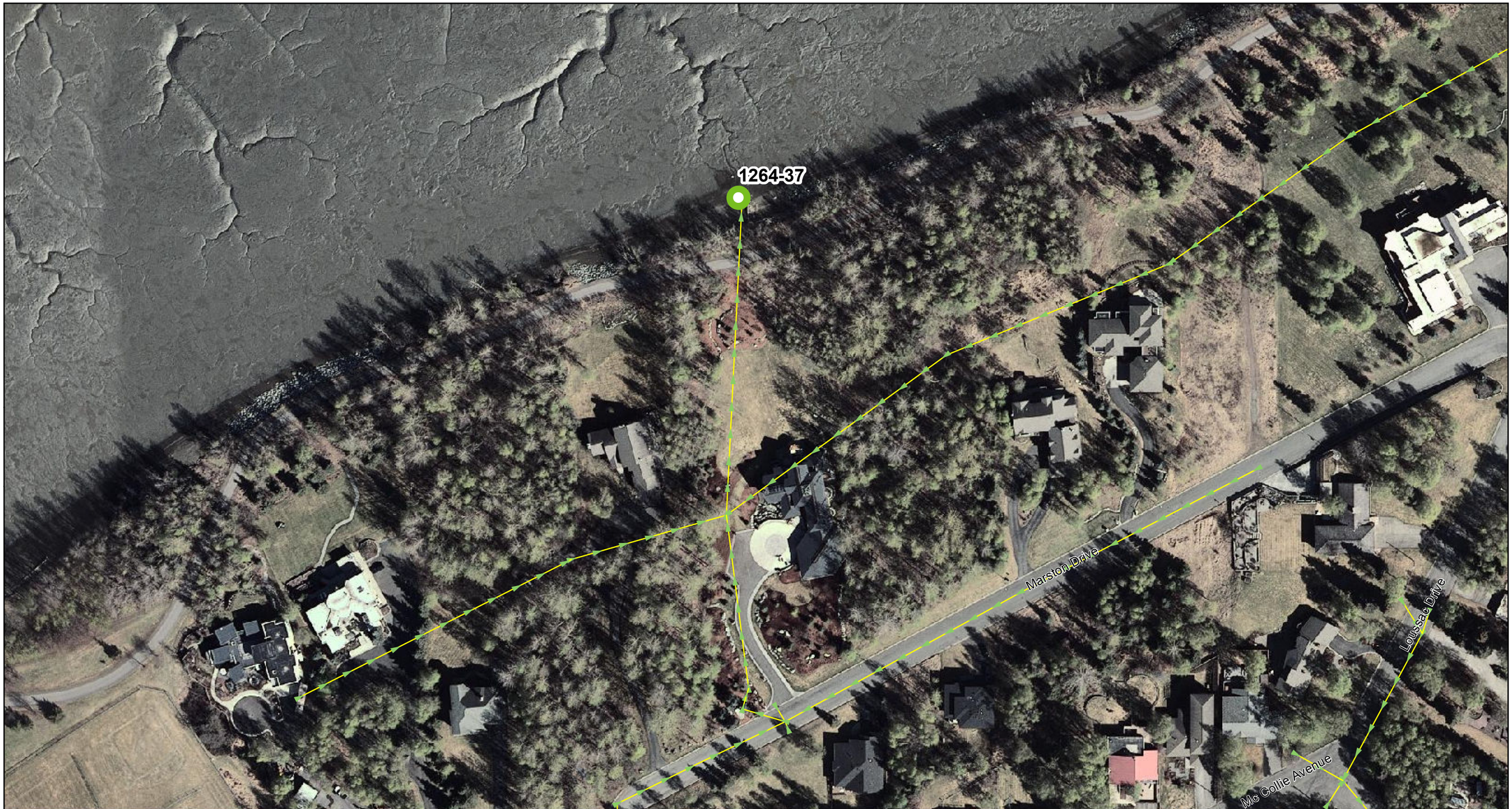
Dry Weather Screening 2020

HoodCreek

Examined and Sampled Outfalls

Map Index

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Sampled Outfall

Drainage Ways
Pipe

Drainage Way Nodes
End of Pipe (EOP)
Outfall

0 100 200 Feet

Dry Weather Screening 2020

HoodCreek

Examined and Sampled Outfalls

Page 1

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

715-1

142-1

502-16

Sonstrom Drive

HOOD CREEK

Pete's Place

Illiamna Avenue

Foraker Drive

LEGEND

- 2020 Sampled Outfall
- 2020 Examined Outfall, Alternate
- 2020 Examined Outfall, Not Suitable
- Stream

Drainage Ways

- Pipe
- Routing
- Open Channel
- Xing Culvert; 2

Drainage Way Nodes

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

0 100 200 Feet

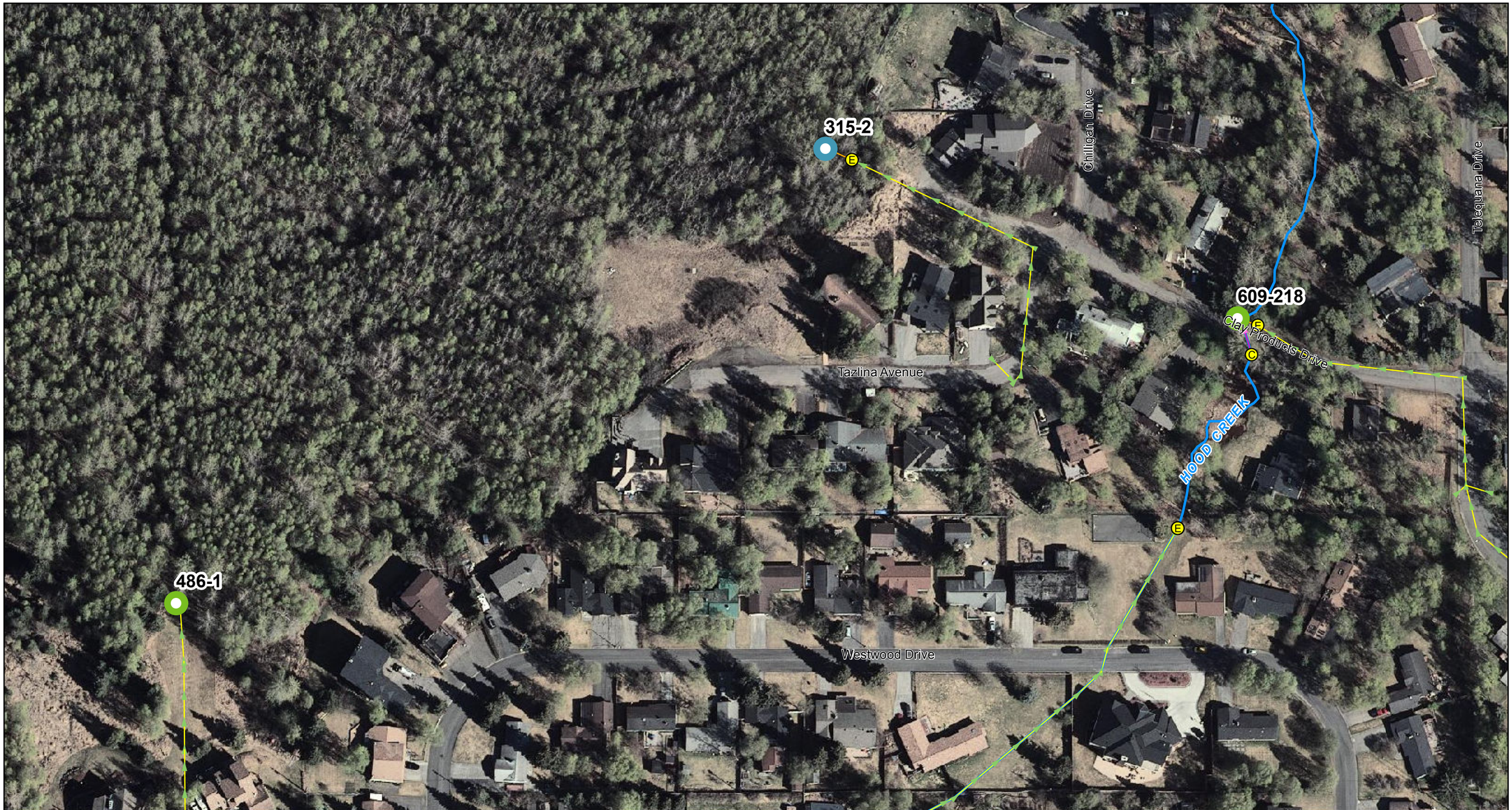
Dry Weather Screening 2020

HoodCreek

Examined and Sampled Outfalls

Page 2

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Sampled Outfall
- 2020 Examined Outfall, Alternate
- Stream

Drainage Ways

- Pipe
- Routing
- Xing Culvert; 2

Drainage Way Nodes

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

0 100 200 Feet

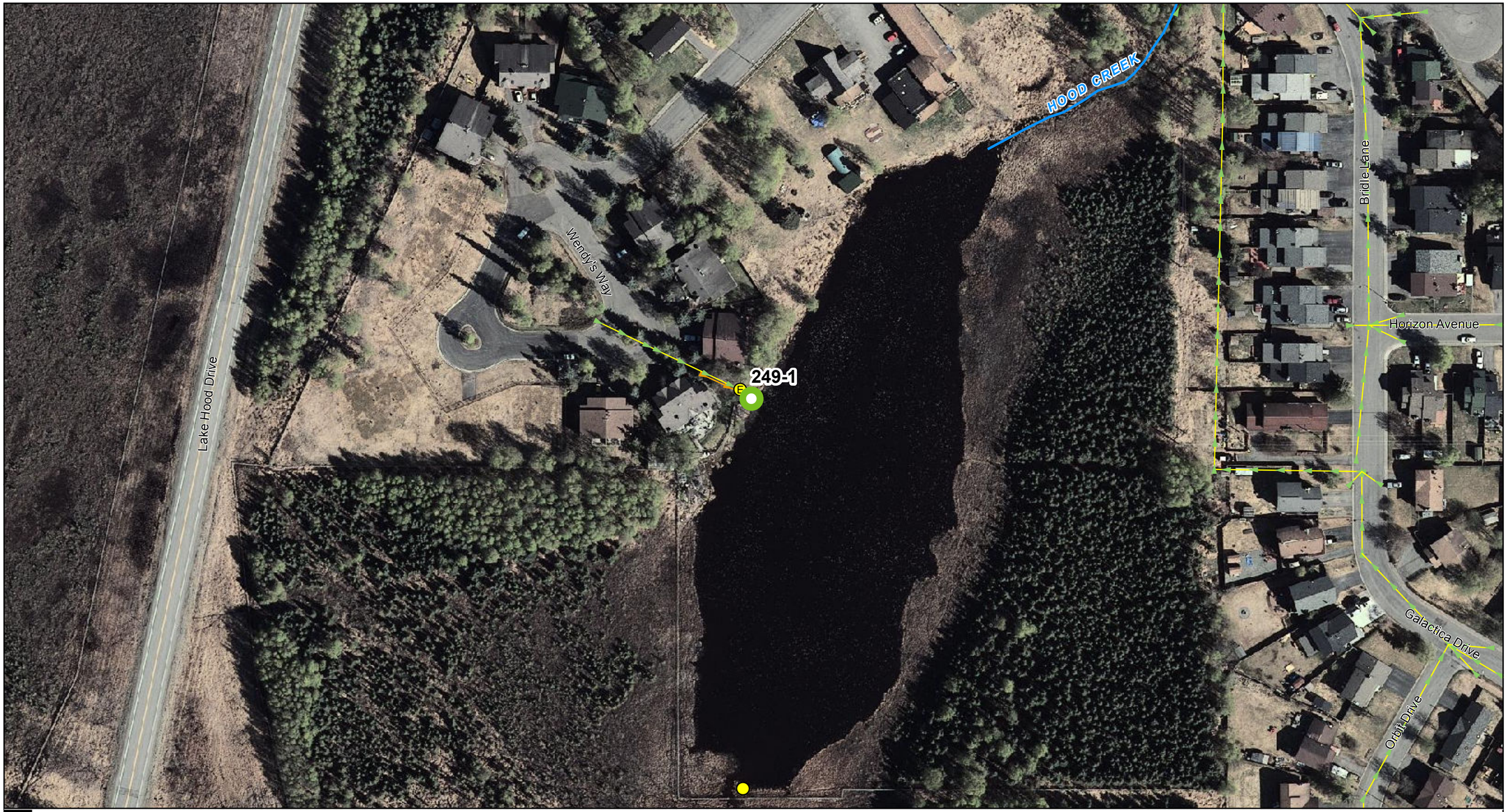
Dry Weather Screening 2020

HoodCreek

Examined and Sampled Outfalls

Page 3

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Sampled Outfall

Stream

Drainage Ways

Pipe

Routing

Open Channel

Drainage Way Nodes

End of Pipe (EOP)

Outfall Minor

Outlet

0 100 200 Feet

Dry Weather Screening 2020

HoodCreek

Examined and Sampled Outfalls

Page 4

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

1
2
3
4
5
6
7

SHIP CREEK

Remnant subdrainage within Ship Creek composite watershed

LEGEND

- 2020 Investigated Outfall
- Map Page Index
- Stream
- Watershed Boundary
- Watershed Remnant

0 0.25 0.5 Miles

Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Map Index

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

LEGEND

2020 Examined Outfall, Alternate

Drainage Ways
Pipe

Drainage Way Nodes
C Control Outlet
E End of Pipe (EOP)
Outfall

0 100 200 Feet

Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 1

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

LEGEND

2020 Examined Outfall, Alternate

Stream

Drainage Ways

Pipe

Routing

Xing Culvert; 2

Drainage Way Nodes

Control Outlet

End of Pipe (EOP)

Outfall

Outfall Minor

0 100 200 Feet

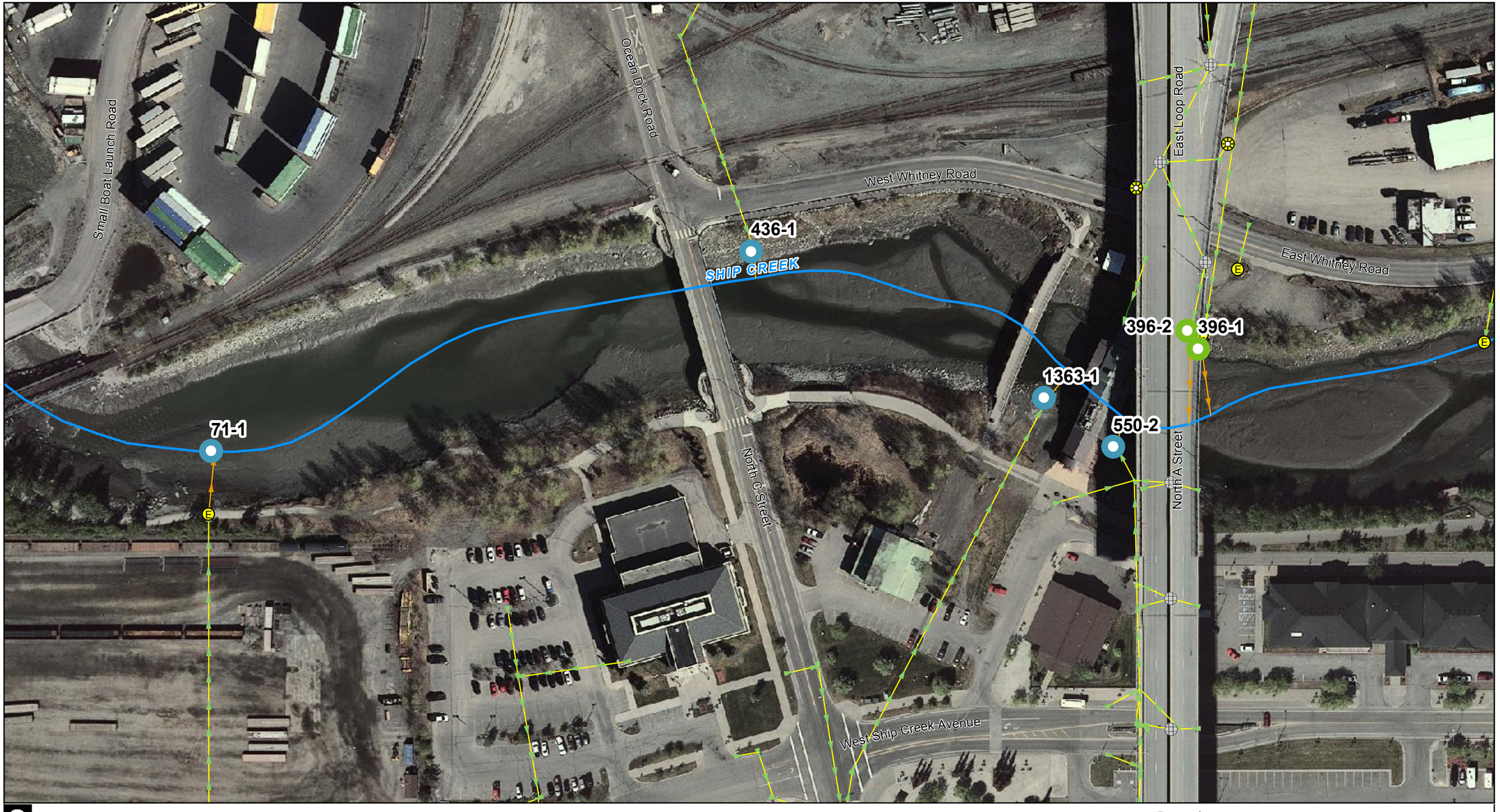
Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 2

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Sampled Outfall
- 2020 Examined Outfall, Alternate
- Stream

Drainage Ways

- Pipe
- Routing
- Open Channel

Drainage Way Nodes

- Catchbasin Manhole
- End of Pipe (EOP)
- Manhole
- Outfall
- Outfall Major
- Outfall Minor

0 100 200 Feet

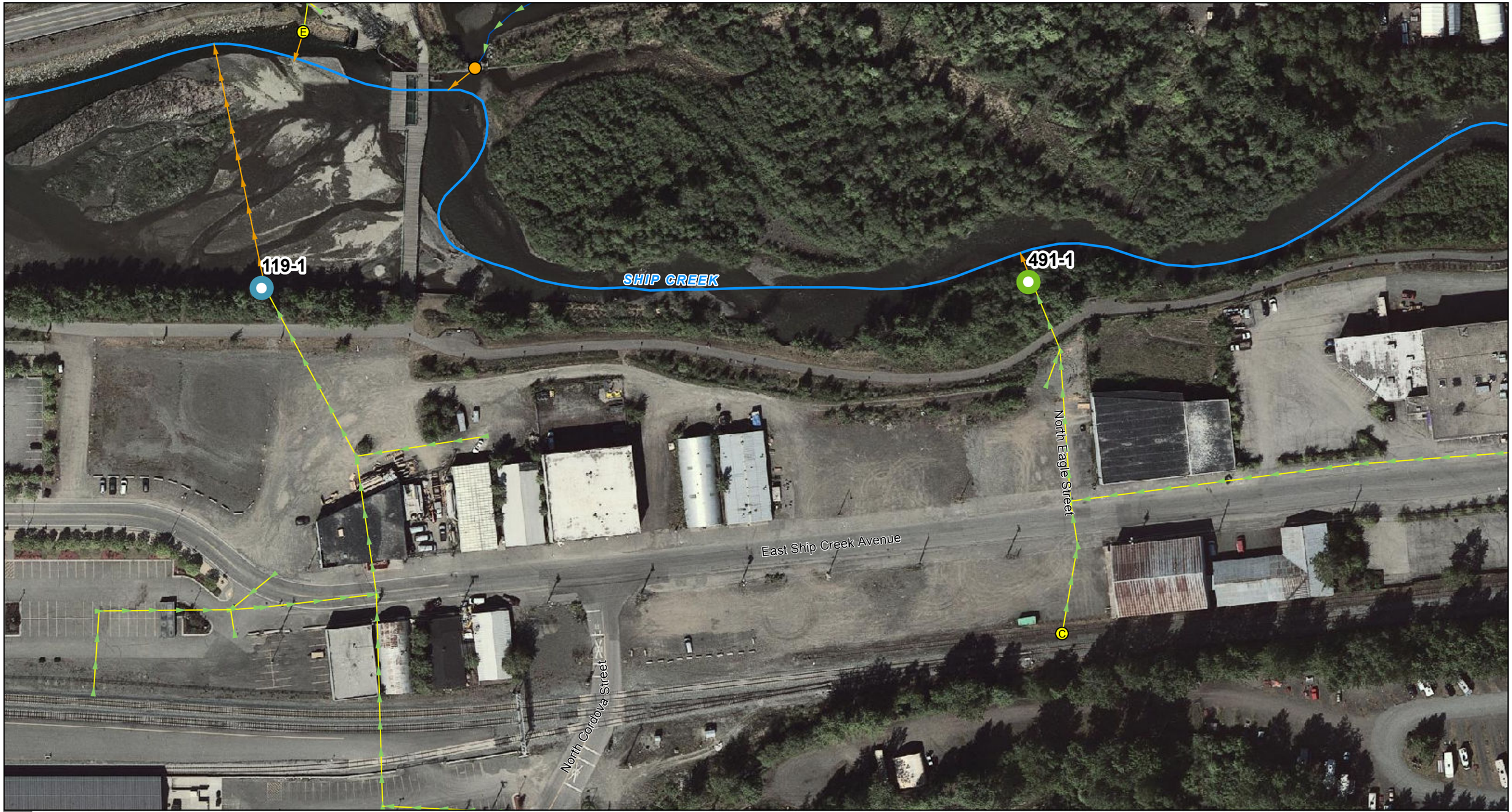
Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 3

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

- 2020 Sampled Outfall
- 2020 Examined Outfall, Alternate
- Stream

Drainage Ways

- Continuity
- Pipe
- Routing

Drainage Way Nodes

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

0 100 200 Feet

Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 4

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

LEGEND

- 2020 Examined Outfall, Alternate
- 2020 Could Not Locate Outfall
- Stream

Drainage Ways

- Continuity
- Pipe
- Routing
- Open Channel

Drainage Way Nodes

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

0 100 200 Feet

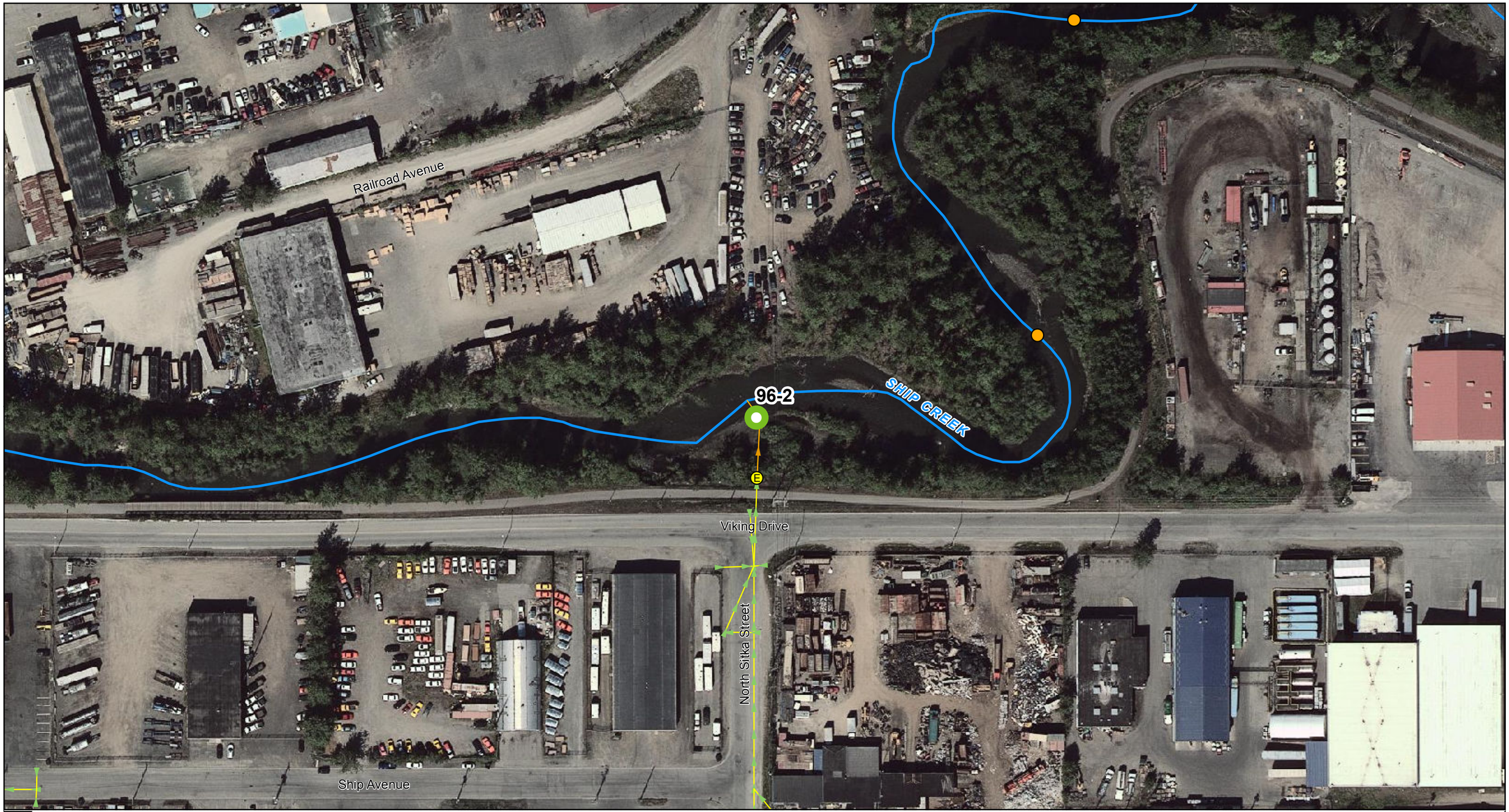
Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 5

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Sampled Outfall

Stream

Drainage Ways

Pipe

Routing

Drainage Way Nodes

End of Pipe (EOP)

Outfall

Outfall Major

0 100 200 Feet

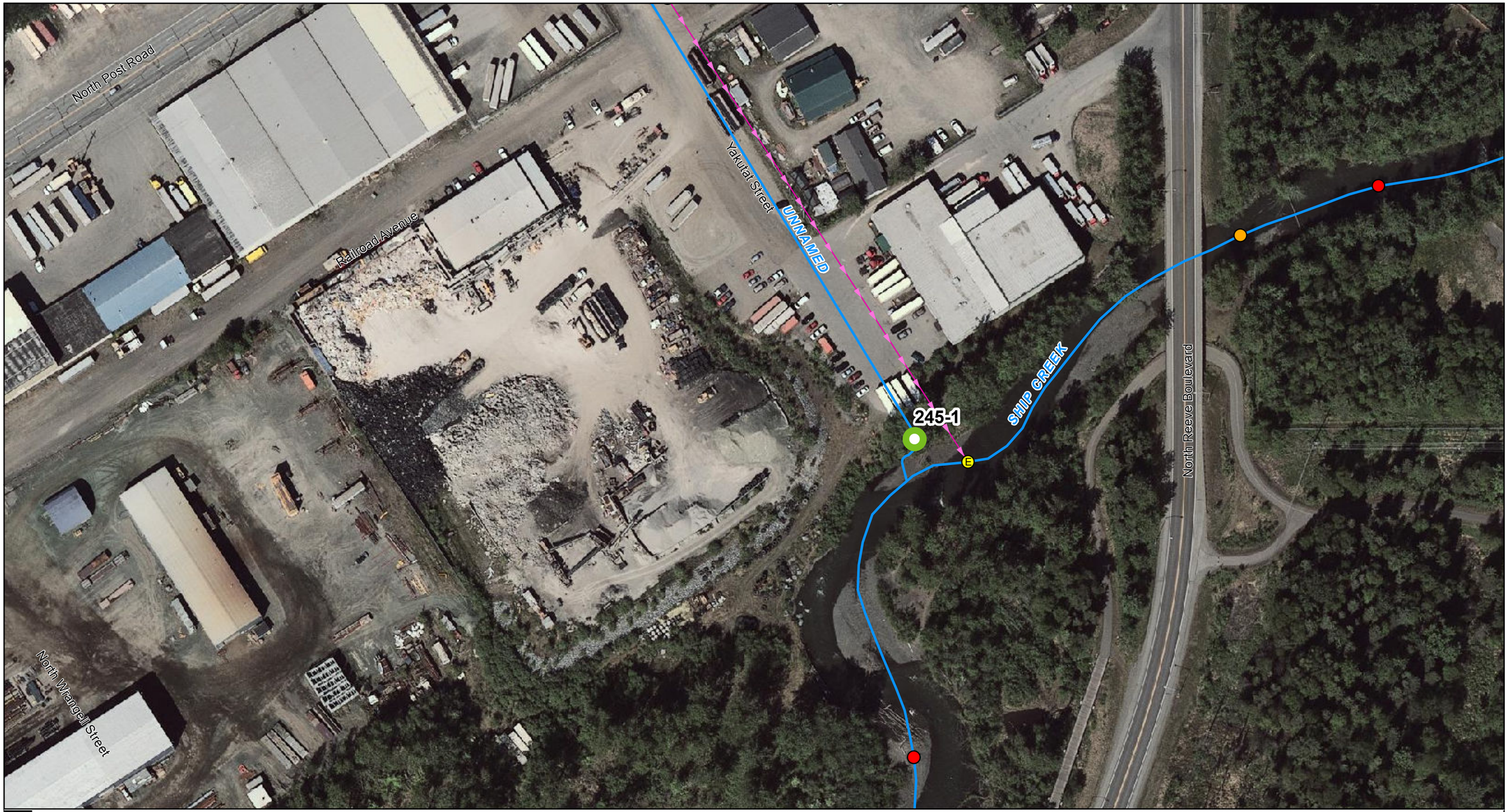
Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 6

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020



LEGEND

2020 Sampled Outfall

Stream

Drainage Ways

Xing Culvert; 2

Drainage Way Nodes

Control Outlet

End of Pipe (EOP)

Outfall

Outfall Major

0 100 200 Feet

Dry Weather Screening 2020

Ship Creek

Examined and Sampled Outfalls

Page 7

Source: MOA HGDB 2020
Imagery: MOA Pictometry 2015
HDR Alaska, Inc.
10/8/2020

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Appendix B

Field Notes

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Table B-1. Outfalls Investigated During 2019 DWS Program

Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Condition Notes
Eagle River				
Mainstem				
541-1	Examined; Not Suitable for Sampling	61.29843	-149.52205	North bank, on utility easement from Mountain Point Cir. EOP is in concrete headwall, discharges into swale above trail. EOP is heavily backwatered, cannot isolate sample of stormwater. Outlet from swale not flowing, no evidence of flow below outlet culvert to creek. Water in swale likely being absorbed into wetland and infiltrating.
1417-1	Examined; Alternate	61.29865	-149.51365	North bank, south of Driftwood Bay Dr. at Meadow Park Cir. Well-defined flow path below EOP. Steady flow. Outfall in good condition.
1451-1	Examined; Alternate	61.29965	-149.50854	North bank, south of Driftwood Bay Dr. west of Riverside Dr. Outfall discharges to creek that flows to Eagle River.
1451-2	Examined; Alternate	61.29903	-149.50611	North bank, outfall is below Riverside Dr. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2017. Flowing and partially backwatered. Outfall discharges from drainage way 1451-6-1 into swale that flows to southeast toward Eagle River.
Meadow Creek				
1375-1 EOP	Examined; Alternate	61.31557	-149.56744	North bank, west of Old Eagle River Loop Road. Flowing. Grate clogged with urban debris. Outfall location in HGDB is incorrect (as of August 10, 2020); given temporary ID by HDR in 2020. Identified as ER 37 in field log.
751-2	Examined; Alternate	61.31436	-149.56775	West of Old Eagle River Loop Road across from Baranoff Ave. Discharges into utility cut. EOP clogged with organic debris. Not flowing at time of visit. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2020. Identified as ER 38 in field log.
751-1	Examined; Alternate	61.31306	-149.56029	West of Genora St. between Big Horn Cir. and Foothill Ave. Good condition. Not flowing at time of visit. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2020. Identified as ER 39 in field log.
Eagle River Loop Creek				
1455-1	Cannot Access	61.32557	-149.58539	West of Banff Springs St. EOP is on Joint Base Elmendorf Richardson (JBER); cannot access.
1147-1	Examined; Alternate	61.32710	-149.58158	East of Glenn Hwy bike path at Galena Bay Dr. Not flowing at time of visit, evidence of recent flow. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2020. Identified as ER 41 in field log.
1147-2	Examined; Alternate	61.32522	-149.58022	East of Glenn Hwy bike path at Heritage Court. Slightly backwatered. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2020. Identified as ER 40 in field log.

Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Condition Notes
1147-3	Examined; Alternate	61.32379	-149.57875	East of Glenn Hwy bike path at Heritage Court. Slightly backwatered at EOP, flow in flow channel downstream of outfall. Not shown as outfall in HGDB (as of August 10, 2020), given temporary ID by HDR in 2020. Identified as ER 42 in field log.
1336-1	Cannot Access	61.33343	-149.58548	West of Glenn Highway opposite Berthod Way. EOP discharges behind fence on JBER, cannot access.
1390-2	Examined; Not Suitable for Sampling	61.33600	-149.58232	South of Rosenburg Cir. and Rosser Dr. Flow was audible within pipe, but not discharging from outfall. Likely infiltrating prior to EOP.
Hood Creek				
Mainstem				
715-1	Examined; Not Suitable for Sampling	61.20136	-149.95473	North of Coastal Trail opposite Pete's Place. Creek and MS4 corouted and discharge into Cook Inlet.
Cook Inlet				
315-2	Examined; Alternate	61.19821	-149.96197	West end of Clay Products Dr. Not flowing at time of visit.
142-1	Examined; Alternate	61.20159	-149.95399	North of the Tony Knowles Coastal Trail at the spur from Pete's Place. Not flowing at time of visit.
Ship Creek				
81-73	Examined; Alternate	61.22329	-149.89942	South bank at mouth of Ship Creek, north of Small Boat Launch Rd. Good condition. Not flowing.
972-1	Examined; Alternate	61.22554	-149.89158	North bank at mouth of Ship Creek, west of Western Dr. Not flowing.
71-1	Examined; Alternate	61.22343	-149.89127	South bank upstream of railroad bridge and Small Boat Launch Rd. Submerged at high tide.
436-1	Examined; Alternate	61.22404	-149.88780	North bank, east of Ocean Dock Rd. Good condition. Not flowing.
1363-1	Examined; Alternate	61.22359	-149.88592	South bank, below pedestrian bridge from King's Landing. Backwatered at low tide, cannot isolate sample.
550-2	Examined; Alternate	61.22343	-149.88548	South bank, just east of The Bridge restaurant. Backwatered at low tide, cannot isolate sample.
119-1	Examined; Alternate	61.22327	-149.88066	South bank downstream of Knik Arm Power Plant Dam. Corroding. Not flowing at time of visit.
213-1	Examined; Alternate	61.22363	-149.86918	South bank behind allied Alaska Moving & Storage. Flowing, partially backwatered. Discharges into small side channel to Ship Creek.
82-1	Examined; Alternate	61.22364	-149.86824	North bank, south of E. Whitney Rd., behind industrial metal recycling facility. EOP is buried beneath organic and metal debris. Flow channel is impounded by Ship Creek Trail, forming small impounded pond.
154-1	Could Not Locate	61.22340	-149.86517	North bank. HGDB shows EOP at Whitney Rd. near Post Rd. Flow present along railroad tracks, could not locate outfall.

Note: EOP = end of pipe

5/27/2020

DWS Recon.

Team: E. Packer
K. Grandhauser

Ⓐ good to sample

Temp: ~~60~~ 52°F, sunny

Time: 940, left office.

SHP 245-1 Ⓐ

easy to access,

good flow.

culvert under debris, hard to see

back watered?

Syrafoam DS

parked in commercial lot nearby at fall

10:15

SHP 96-2 Ⓐ

easy to access

perched, 6ft

good flow. 3in water depth.

~~3ft, 3in~~ 36 in.

clear water.

~~some~~ parallel parking west of outfall

1055

SHP 154-1 - end of whitney Rd

veg + sed, didn't find pipe → cont'd

SHP 154-1 cont.

Dug around + found nothing flow present, flows along RR embankment.
→ not sample-able.
Open-channel conveyance to SHP creek

11:15

SHP 82-1

other culvert accessible NE of GIS Pt.
Culvert @ GIS Pt is not accessible due to business fencing.
other culvert somewhat covered in veg but flowing could be used as secondary approach from East.

SHP 213-1 R secondary

- Accessible behind moving co. building, in their open fence
~24 in, 1/3 full of water flowing but backwatered
small stream and meetr w/ main channel, orange tinted color

SHP 491-1 SCOOK

- Culvert is slightly more South than GIS pt, very close to the north side of the walking / bike path.
- little bit of flow, 1/3 full, backwatered.
- Stream to main channel
- probably not great choice to sample
- easy access, over short bike path fences.

11:50

SHP 119-1

Good access. DRY

Pipe rusted + corroding

Holes in bottom of pipe sampling ~~+~~ would be hard

pipe possibly crushed / partially collapsed deeper into the pipe.

- not good for sampling.

SHP 550-2

Smashed in dirt / mud

not flowing (See pic)

SHP 550-1

- very close to edge of water
- submerged
- maybe sampleable @ low tide

SHP 1363-1

Backwatered. 1/2 full

smashed, under concrete "Box" remains

4/9

SHP 396-2 (A)

~36 in ~~CMP~~ Plastic

Good condition

Good flow

Some green algae.

SHP 396-1 (A)

~36 in Metal culvert

good flow

Grate over face

green algae.

Bags in culvert, oil absorber?

flows into main channel

after some rocks.

SHP 71-1

must get @ low tide

Right now under water

good condition

very muddy.

- secondary

SHP 436-1

CMP

Dry, good condition.

2:10pm

HD 249-1

12 inches
lightly corroded
low flow
slightly backwatered
flows into pond
- secondary
slight orange water color

2:20

HD 486-1 odd turbidity

- notified homeowners before entering.
- 36"
- turbid
- rust colored
- flow, small but could sample
- flow out to large stream
- secondary or primary.

scum, slightly right outside of outfall

HD 315-2 12". maybe

very small, off of steep embankment but accessible
Dry, parked @ end of Clay Pottery Rd.

cont

6/9 HD 609-218 ⊛
2:45
East is storm culvert
South is stream
flowing, good condition 24"
plastic collar
clear flow
culvert + stream merge and
flow north DS.
- primary

HD 142-1
Cross drainage, no flow.
went west nearby.
HD outfall ? ⊛ near 142-1
in pics
flowing. strong
riprap around crushed collar
but culvert looks okay.
flows into little stream into
inlet.
Accessed from Coastal
bike trail

- Primary if really Hood
culvert.

HD outfall ? cont

- cross drainage to the East.
- small culvert just west of flowing culvert
- culvert remains DS ~~of flow~~ at least 3.

3:05 pm

HD 502-16

assessed from bike trail
small but steady flow.
good condition
slightly lifted
clear water
orange algae nearby
flows out into inlet.
cross flow?

EOP HD 502-16

South of Bike path
12"
veg.
Backwatered, some, small flow

8/9

3:30pm

HD 1264-37

- Accessed from Bike trail
- long exposed culvert
- eroded bottom, flow, medium, coming out of 15pt up from EOP
- Green, long stranded algae.
- would try to sample from erosion in pipe. Bring small laddle w/ long handle to get underneath culvert.
- flow into inlet.
- Secondary, maybe primary if we can make work.

4:10pm

SHP 278-1

accessed from Northpointe Dr. Behind 1046 house

Down steep slope- lots of riprap 18" - 24"

good condition, small debris & smallest trickle ever!!

425pm

SHP 81-73 By parking spot 77

accessed via small boat launch

48", DRY

CMP, good condition

can see light @ other end

435pm

SHP 972-1

Plastic, good condition.

Some wet sand in culvert

but otherwise dry.

24"

In AK marine line last.

Below, flow from somewhere goes out to inlet, not connected.

- Finished @ 445 pm.
- Informed A Gerlek of finished field day,
- K. Grundhauser returned to work to put away equipment

Note: iPad died very quickly because GPS was constantly running. Don't know how to turn off. Took 2 additional chargers.

END DAY 4 / KRG

5/29/2020
DWS Recon

Eagle River Watershed.

Team: E. packer, K. Grundhauser

Weather: 57-68°F, sunny

Time: 9:30, left office.
- texted Alena that we were headed out.

ER 1335-1 EOP
- 4 foot culvert
- flowing steady
- Debris caught in grate, will have to remove some before sampling.
flows into riprap lined (sides) channel.
- good condition otherwise
- some green algae.

10:30
ER 303-1 EOP
- 36" culvert
- good flow
- followed drainage blue markers
- flow down rocks into stream
- clear
- light
- accessed from May Court
- perched slightly

cont →

ER 541-1 EoP

Good access
heavily backwatered, 3/4 full
pretty stagnant water.
concrete headbox
plastic culvert

10:50

ER 1417-1 EoP

12" culvert
backwatered, 1/2 full
cleaned out leave debris + Styrofoam.
~~Broken~~ flowing.
clear water
~~Some~~ leaf debris ↓

ER 1451-b-1 EoP

- accessed off of private property, parking @ North end.
- Backwatered, some flow 1/4 full
- woody/ leaf debris
- 12"
- plastic
- supported rebar inside culvert.

ER 1451-1 EOP ⊛

- Right by guard rail
- marked by drainage stick.
- steady small flow.
- long green algae.
- some debris, organic.
- flows into riprap.
- possible dead rabbit DS.

11:50

ER # 34 ⊛

- no node #, notes about 2014 secondary.
- 18"
- good flow
- slightly perched.
- green algae + moss growing in culvert.
- deposits into stream directly

ER 646-71 ⊛ or Secondary

- Behind 17550 Teklanika Dr.
- Asked home owner before entering
- easier to access w/ boots on.
- plastic 36"
- slightly perched ~~pear~~
- good flow, stream almost comes to bottom of culvert

Cont →

1210

ER # 39

- 3 ft
- plastic metal grate over front.
- Dry.
- ~~rip~~ rap DS
- Trash, some stuck in grate.

ER # 38

18", DRY

- Super full of organic debris.
- plastic w/ plastic collar
- lots of rebar

1230

ER # 37

- ~~24~~ 18"
- Dribble, plush w/ stream level
- Super full of trash, debris
- metal grate w/ plastic culvert.

cont →

1:10

5/7

ER #42

- 36", metal, metal collar.
- 3" water, backwatered.
- some orange algae
- good flow DS.
- ~~South~~ Culvert north of GIS point, on E side of bike trail.

ER #40 EOP

- US from marked node.
- 3ft, Dry.
- muddy bottom + path DS.
- little bit of debris.
- CMP w/ concrete surrounding → concrete collar
- good condition.
- mud building up after lip of culvert

1:40

ER #41 EOP

- found by looking for cut pavement (see picture)
- ~~Between~~ bike trail + Hwy.
- wate but no flow, backwatered.
- ~~slated~~ metal grate over it. Slanted

Cont

ER 1455-1
- on BASE, can see through fence
- unable to access/sample

215

ER 1390-2
- wet but not no flow
- can hear flow in culvert
- debris in culvert, on grate in culvert
- plastic culvert + collar
- good condition
- informed homeowner before entering.
- water can be heard @ manhole US and inlets, ground infiltration?

2:30

ER 1336-1 ↳ accessed from ER 1390-2
- plastic, 4 ft
- good flow
- flow level w/ DS
- some small debris in metal rebar grate
- secondary
- Could be accessed from SB HWY.

cont →

ER 1336-1 cont

- 16-ws onto Base.

3pm, finished in the field.

- texted Alma to inform of end of field day.

- E. Parker headed to ANC.
- K. Grandhaver headed to ANC and dropped supplies off @ office.

END of field day

KRG

Appendix C

Field Data Forms

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DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Transportation & Facilities, State of Alaska | Department of Public Works | Watershed Management

Outfall Number: HD 249-1

Part 1. General Information

1. Date 6/12/2020 Time 11:35
2. Field Crew C. Helmericks, K. Grindhauser, K. Bischofberger Water quality analyses conducted by: C, H, XG, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 1.5 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: VG ↑ DS, grass to path 12. Structural Condition: CMP, good, Grate, Heat trace
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	6.9 pH units
Total chlorine	0.3 ppm
Detergents	0 ppm
Total copper	[illegible] ppm
Total phenols	0 ppm
Turbidity (outfall)	37.5
Turbidity (upstream)	
Fecal Coliform	

Temp 12.1°C

Part 4. Comments:

slow flow

DRY WEATHER SCREENING FIELD DATA FORM

Municipality of Anchorage | Transportation & Public Facilities, State of Alaska | Department of Public Works | Watershed Management

Outfall Number: HD 486-1 and Dup

Part 1. General Information

1. Date 6/12/2020 Time 11:15 Dup 11:20
2. Field Crew CH, KG, KB Water quality analyses conducted by: CH, KG, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 3 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 0.25 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☒ Moving oily sheen ☒ Surface scum ☒ Soapy suds ☐ Debris ☐ Other
11. Vegetation: leaves ↓ 12. Structural Condition: plastic pipe and collar
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☐ Clear ☒ Colored lightly yellow tinted
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	6.1 pH units
Total chlorine	0 ppm	0.1 ppm
Detergents	0 ppm	0 ppm
Total copper	0 tot, 0 free ppm	0 free, 0 total ppm
Total phenols	0 ppm	0 ppm
Turbidity (outfall)	0.30	25.4
Turbidity (upstream)		
Fecal Coliform		

Temp 11.1 °C

Water Quality Samples	
Parameter	**Primary Sample**
pH	6.1 pH units
Total chlorine	0 ppm
Detergents	0 ppm
Total copper	0 free, 0 total ppm
Total phenols	0 ppm
Turbidity (outfall)	25.4
Turbidity (upstream)	
Fecal Coliform	* LAB

Temp 11.1 °C

Part 4. Comments:

Scum at outfall, organic smell, iron precipitate.

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: HD 502-16 EOP

Part 1. General Information

1. Date 6/12/2020 Time 12:05
2. Field Crew CH, KG, KB Water quality analyses conducted by: CH, KG, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 3 inches
6. Depth of water in end-of-pipe: 0 feet 4.5 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: leaves 12. Structural Condition: CMP, good
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____

17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.5 pH units
Total chlorine	0.2 ppm
Detergents	0.1 ppm
Total copper	0 tot, 0 free ppm
Total phenols	0 ppm
Turbidity (outfall)	0.28
Turbidity (upstream)	
Fecal Coliform	

Temp: 50°F

Part 4. Comments:

DRY WEATHER SCREENING FIELD DATA FORM

Municipality of Anchorage | Transportation & Public Facilities, State of Alaska | Department of Public Works | Watershed Management

Outfall Number: HD 609-218

Part 1. General Information

1. Date 6/12/2020 Time 10:28
2. Field Crew CH, AG, EP, KG, KB Water quality analyses conducted by: C. Helmericks, KG, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 2 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 2 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad,
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☒ Debris ☐ Other
11. Vegetation: leaves ↓ 12. Structural Condition: plastic pipe + collar, good condition.
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	Ofree, 0 total ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.3	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.5 pH units
Total chlorine	0.4 ppm
Detergents	0 ppm
Total copper	Otal, Ofree ppm
Total phenols	0 ppm
Turbidity (outfall)	0.91
Turbidity (upstream)	
Fecal Coliform	

temp 12.1°C

Part 4. Comments:

Small debris in outfall
orange staining in OS creek, could be from main creek and not outfall.

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: HD 1264-37

Part 1. General Information

1. Date 6/12/2020 Time 12125
2. Field Crew CH, KG, KS; Water quality analyses conducted by: KG, CH, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 4 inches
6. Depth of water in end-of-pipe: - feet - inches could not obtain

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☑ Other
11. Vegetation: grasses in area 12. Structural Condition: eroded hollow, 10ft up from end
13. Biology green algae

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.5 pH units
Total chlorine	0.2 ppm
Detergents	0 ppm
Total copper	0.3/0 ppm
Total phenols	0 ppm
Turbidity (outfall)	0.45
Turbidity (upstream)	
Fecal Coliform	

Temp 8.4°C

Part 4. Comments:

Iron precip on rocks, green algae
Sampled from eroded hole 10ft up, on pipe.

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: SHP 96-2 (S duplicate collected)

Part 1. General Information

1. Date 6/12/2020 Time 11:54
2. Field Crew AG, EP Water quality analyses conducted by: EP, AG, KG, & CH
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 3 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 2.25 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) iPad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: – 12. Structural Condition: good
13. Biology –

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	7.4 pH units
Total chlorine	0 ppm	0 ppm
Detergents	~~0.00~~ 0 ppm	0 ppm
Total copper	0 tot, 0 free ppm	0 free, 0 tot ppm
Total phenols	0 ppm	0 ppm
Turbidity (outfall)	0.30	0.65
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.4 pH units
Total chlorine	0 ppm
Detergents	0.1 ppm
Total copper	0 free, 0 tot ppm
Total phenols	0 ppm
Turbidity (outfall)	0.54
Turbidity (upstream)	
Fecal Coliform	

7.5°C dup 7.4°C

Part 4. Comments:

outfall perched ~ 6 ft above creek
pipe is in good condition - missing grate?

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: SHP 245-1

Part 1. General Information

1. Date 6/12/20 Time 12:20
2. Field Crew AG, EP Water quality analyses conducted by: CH, KG, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☑ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 2 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 5 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) iPad
8. Water flowing from end-of-pipe? ☐ No ☑ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☑ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☑ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: — 12. Structural Condition: Good
13. Biology —

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☑ Clear ☐ Colored _____
17. Water Quality Analyses:

13.3°C

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	pH units
Total chlorine	0 ppm
Detergents	0 ppm
Total copper	ppm
Total phenols	0 ppm
Turbidity (outfall)	
Turbidity (upstream)	
Fecal Coliform	

Part 4. Comments:

likely Streamflow

EOP is covered w/ overhanging veg, but flow path is in good condition. Sand in flow path to pipe

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: SHP 396-1

Part 1. General Information

1. Date 6/12/2020 Time 11:17
2. Field Crew AG, EP Water quality analyses conducted by: CH, EP, KG, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 3 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 2 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) iPad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☐ No ☒ Yes *If yes, describe in comment section.* slight mist
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: — 12. Structural Condition: good
13. Biology algae on grate

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

8.5°C

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.6 pH units
Total chlorine	0.2 ppm
Detergents	3.1 ppm
Total copper	0/0 ppm
Total phenols	0 ppm
Turbidity (outfall)	2.03
Turbidity (upstream)	
Fecal Coliform	

Part 4. Comments:

good condition
flowing down rip rap to creek

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: SHP 396-1 Rc

Part 1. General Information

1. Date 6/16/2020 Time 12:25
2. Field Crew L. Spencer, K. Grundhauser Water quality analyses conducted by: N/A
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 3 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 1 3/8 inches 17" across

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: green algae 12. Structural Condition: CMP with grate, good.
13. Biology None.

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	ppm	ppm
Detergents	ppm	ppm
Total copper	ppm	ppm
Total phenols	ppm	ppm
Turbidity (outfall)		
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	pH units
Total chlorine	ppm
Detergents	ppm
Total copper	ppm
Total phenols	ppm
Turbidity (outfall)	
Turbidity (upstream)	
Fecal Coliform	

Temp 6.1 °C

Part 4. Comments:

Resample fecal, first sample: 935 col/100mL
over limit: 400 col/100mL

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — WATERSHED MANAGEMENT

Outfall Number: SHP 396-2-1

Part 1. General Information

1. Date 6/12/2020 Time 11:26
2. Field Crew AG, EP Water quality analyses conducted by: KG, CH, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 2 feet 6 inches
6. Depth of water in end-of-pipe: 0 feet 0.5 inches

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) 1 pad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: — 12. Structural Condition: good
13. Biology algae in pipe + on rocks

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

4.7°C

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 total / 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.1 pH units
Total chlorine	0 ppm
Detergents	0 ppm
Total copper	0 free 0 ppm
Total phenols	0 ppm
Turbidity (outfall)	0.46
Turbidity (upstream)	
Fecal Coliform	

Part 4. Comments:

good condition
outfall perched 1.5 ft above riprap
pipe has positive slope - water visible further in pipe is deeper

DRY WEATHER SCREENING FIELD DATA FORM

Anchorage | Department of Public Works | Watershed Management

Outfall Number: SHP 491-1

Part 1. General Information

1. Date 6/12/2020 Time 12:30
2. Field Crew AG, EP Water quality analyses conducted by: CH, KB, EP, AG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 6 inches backwatered

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) 1 Pad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: – 12. Structural Condition: good
13. Biology –

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

9.5°C

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 tot, 0 free ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.30	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	pH units
Total chlorine	0 ppm
Detergents	0.1 ppm
Total copper	ppm
Total phenols	0 ppm
Turbidity (outfall)	2.42
Turbidity (upstream)	
Fecal Coliform	

Part 4. Comments:

flow path is somewhat backwatered at EOP but flowing in channel to creek

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — Watershed Management

Outfall Number: ER #34

Part 1. General Information

1. Date 6/16/2020 Time 14:20
2. Field Crew L. Spencer K Gundhausen Water quality analyses conducted by: LS, KG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 1.25 inches width = 6"

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☐ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: moss in pipe 12. Structural Condition: GUP
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☐ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** (1 each sampling event)
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 trace, 0.04 ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.09	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.3 pH units
Total chlorine	~~0.02~~ ppm
Detergents	0 ppm
Total copper	0.0 ppm
Total phenols	0.0 ppm
Turbidity (outfall)	0.55
Turbidity (upstream)	
Fecal Coliform	

0.0 print error

Temp ~~0.4°C~~ 6.4°C

Part 4. Comments:

6/16/2020 LS

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — Watershed Management

Outfall Number: EP "20th"

Part 1. General Information

1. Date 6/16/2020 Time 13:20
2. Field Crew L. Spencer, K. Gironimo-Myers Water quality analyses conducted by: LS, KG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 1 feet 10 inches
6. Depth of water in end-of-pipe: 0 feet 1.25 inches width: 10.5"

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad.
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☒ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: leaves ↓ 12. Structural Condition: CMP, good.
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** (1 each before sampling event)	**Duplicate Sample** (1 each sampling event)
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0.1 free, 0 tot ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.09	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	8.3 pH units
Total chlorine	~~0.02~~ 0.2 ppm
Detergents	0 ppm
Total copper	0.0 ppm
Total phenols	0 ppm
Turbidity (outfall)	0.56
Turbidity (upstream)	
Fecal Coliform	

0.0 ppm free

Temp: 6.7°C

Part 4. Comments:

- ~~Pour~~ perched 5" falls onto large rock
- High water mark high

6/16/2020 DC: (LS)

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — Watershed Management

Outfall Number: ER 646-71

Part 1. General Information

1. Date 6/16/2020 Time 14:30
2. Field Crew L Spencer, K. Gwynthawsen Water quality analyses conducted by: LS, KG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☑ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: ~~2~~ 1 feet 6 inches
6. Depth of water in end-of-pipe: 0 feet 3 inches width = 8"

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) ipad
8. Water flowing from end-of-pipe? ☐ No ☑ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☑ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☑ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☐ Debris ☐ Other
11. Vegetation: moss inside 12. Structural Condition: Plastic, good.
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☑ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** (1 each before sampling event)	**Duplicate Sample** (1 each sampling event)
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 trig 0 tot ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.09	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	7.9 pH units
Total chlorine	0 ppm
Detergents	0 ppm
Total copper	0.0 ppm
Total phenols	0.1 ppm
Turbidity (outfall)	0.52
Turbidity (upstream)	
Fecal Coliform	

0.0 ppm free

Temp 6.0°C

Part 4. Comments:

Water flows directly into stream, dumps right ~~about~~ above stream water level.

6/16/2020 QA/QC (LS)

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — WATERSHED MANAGEMENT

Outfall Number: ER 1335-1 and dup (F)

Part 1. General Information

1. Date 6/16/2020 Time 13:45 Dup: 13:50
2. Field Crew L Spencer, K Grundhauser Water quality analyses conducted by: LS, KG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 5 feet 0 inches
6. Depth of water in end-of-pipe: 0 feet 1.25 inches width = 9"

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) iPad
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☒ Debris ☐ Other
11. Vegetation: None 12. Structural Condition: Some rust at grate, good.
13. Biology None

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored _____
17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** [1 each before sampling event]	**Duplicate Sample** [1 each sampling event]
pH	N/A	8.3 pH units
Total chlorine	0 ppm	0 ppm
Detergents	0 ppm	0 ppm
Total copper	0.1 free, 0 tot ppm	0.0 ppm
Total phenols	0 ppm	0.0 ppm
Turbidity (outfall)	0.09	1.85
Turbidity (upstream)		
Fecal Coliform		

Free 0.0

Temp 7.2°C

Water Quality Samples	
Parameter	**Primary Sample**
pH	8.3 pH units
Total chlorine	~~0.~~ 0.2 ppm
Detergents	0 ppm
Total copper	0.0 ppm
Total phenols	0.0 ppm
Turbidity (outfall)	1.83
Turbidity (upstream)	
Fecal Coliform	

0.0 ppm free

Temp: 7.2°C

Part 4. Comments:

- cleaned out grate before sampled
- lots of garbage

6/16/2020 @ 1 (LS)

DRY WEATHER SCREENING FIELD DATA FORM

Department of Public Works — WATERSHED MANAGEMENT

Outfall Number: ER 1336-1

Part 1. General Information

1. Date 6/16/2020 Time 15:60
2. Field Crew L Spencer, K Grundhauser Water quality analyses conducted by: LS, KG
3. How long since last rainfall? ☐ raining now ☐ less than 3 days ☒ 3 or more days ☐ unknown
4. Size of last rain event. 0.01 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 4 feet 6 inches
6. Depth of water in end-of-pipe: 0 feet 5.25 inches width = 31"

Part 2. Visual Observations

7. Photograph Log: Camera # and frame number (s) 1pa2
8. Water flowing from end-of-pipe? ☐ No ☒ Yes
   If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. *If YES, continue.*
9. Odors: ☒ No ☐ Yes *If yes, describe in comment section.*
10. Floatables in water flowing from end-of-pipe: ☐ None ☐ Moving oily sheen ☐ Surface scum ☐ Soapy suds ☒ Debris ☐ Other
11. Vegetation: grass in area 12. Structural Condition: plastic w/ metal grate
13. Biology none

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 ☐ Cloudy/Muddy
16. Color of water flowing from end-of-pipe: ☒ Clear ☐ Colored

17. Water Quality Analyses:

Quality Control Samples		
Parameter	**Equipment Blank** (1 each before sampling event)	**Duplicate Sample** (1 each sampling event)
pH	N/A	pH units
Total chlorine	0 ppm	ppm
Detergents	0 ppm	ppm
Total copper	0 free, 0 tot ppm	ppm
Total phenols	0 ppm	ppm
Turbidity (outfall)	0.09	
Turbidity (upstream)		
Fecal Coliform		

Water Quality Samples	
Parameter	**Primary Sample**
pH	8.3 pH units
Total chlorine	~~0~~ 0.2 ppm
Detergents	0 ppm
Total copper	0.0 ppm
Total phenols	0.0 ppm
Turbidity (outfall)	=3a
Turbidity (upstream)	
Fecal Coliform	

0.0 ppm Free

Temp = 7.00c

Part 4. Comments:

- Cleaned a little debris from grate before sampling
- flows down channel onto military base, JBER
- heat trace piping down channel

6/16/2020 DEL (LS)

Appendix D

Outfall Sampling Photographs

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Eagle River 303-1. June 16, 2020.

Eagle River 646-71. June 16, 2020.

Eagle River 1335-1. June 16, 2020.

Eagle River 1389-1. June 16, 2020.

Eagle River 1375-00. June 16, 2020.

Hood Creek 249-1. June 12, 2020.

Hood Creek 486-1. June 12, 2020.

Hood Creek 502-16. June 12, 2020.

Hood Creek 609-218. June 12, 2020.

Hood Creek 1264-37. June 12, 2020.

Ship Creek 96-2. June 12, 2020.

Ship Creek 245-1. June 12, 2020.

Ship Creek 396-1. June 12, 2020.

Ship Creek 396-1 Resample. June 16, 2020.

Ship Creek 396-2-1. June 12, 2020.

Ship Creek 491-1. June 12, 2020.

Appendix E

Laboratory Analysis Reports

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Laboratory Report of Analysis

To: HDR Alaska, Inc.
2525 C Street #500
Anchorage, AK 99503
(907)644-2017

Report Number: **1202603**

Client Project: **Dry Weather Screening**

Dear Cynthia Helmericks,

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 Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **HDR Alaska, Inc.**
SGS Project: **1202603**
Project Name/Site: **Dry Weather Screening**
Project Contact: **Cynthia Helmericks**

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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200 West Potter Drive, Anchorage, AK 99518
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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. 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 <http://www.sgs.com/en/Terms-and-Conditions.aspx>. 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 (Provisionally Certified as of 6/02/2020 for Mercury by EPA200.8 and Turbidity by SM2130B) & Microbiology & 17-021 (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). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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.
B	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.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
SHP 396-2-1	1202603001	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
SHP 96-2	1202603002	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
SHP 96-2 DUP	1202603003	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
SHP-245-1	1202603004	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
SHP491-1	1202603005	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 609-218	1202603006	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 486-1	1202603007	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 486-1 DUP	1202603008	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 249-1	1202603009	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 502-16 EOP	1202603010	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
HD 1264-37	1202603011	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)
SHP 396-1	1202603012	06/12/2020	06/12/2020	Water (Surface, Eff., Ground)

Method	Method Description
SM21 9222D	Fecal Coliform (MF)

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Detectable Results Summary

Client Sample ID: **SHP 96-2 DUP**
Lab Sample ID: 1202603003
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	3.3	col/100mL

Client Sample ID: **SHP491-1**
Lab Sample ID: 1202603005
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	12	col/100mL

Client Sample ID: **HD 249-1**
Lab Sample ID: 1202603009
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	10	col/100mL

Client Sample ID: **SHP 396-1**
Lab Sample ID: 1202603012
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	885	col/100mL

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Results of **SHP 396-2-1**

Client Sample ID: **SHP 396-2-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603001
Lab Project ID: 1202603

Collection Date: 06/12/20 11:26
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:32

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:32
Container ID: 1202603001-A

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Results of **SHP 96-2**

Client Sample ID: **SHP 96-2**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603002
Lab Project ID: 1202603

Collection Date: 06/12/20 11:54
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:32

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:32
Container ID: 1202603002-A

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Results of **SHP 96-2 DUP**

Client Sample ID: **SHP 96-2 DUP**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603003
Lab Project ID: 1202603

Collection Date: 06/12/20 11:54
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	3.3		1.67	1.67	col/100mL	1		06/12/20 16:32

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:32
Container ID: 1202603003-A

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Results of **SHP-245-1**

Client Sample ID: **SHP-245-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603004
Lab Project ID: 1202603

Collection Date: 06/12/20 12:20
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	2.00	U	2.00	2.00	col/100mL	1		06/12/20 16:32

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:32
Container ID: 1202603004-A

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Results of **SHP491-1**

Client Sample ID: **SHP491-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603005
Lab Project ID: 1202603

Collection Date: 06/12/20 12:50
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	12		1.67	1.67	col/100mL	1		06/12/20 16:32

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:32
Container ID: 1202603005-A

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Results of **HD 609-218**

Client Sample ID: **HD 609-218**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603006
Lab Project ID: 1202603

Collection Date: 06/12/20 10:28
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603006-A

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Results of **HD 486-1**

Client Sample ID: **HD 486-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603007
Lab Project ID: 1202603

Collection Date: 06/12/20 11:15
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603007-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Results of **HD 486-1 DUP**

Client Sample ID: **HD 486-1 DUP**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603008
Lab Project ID: 1202603

Collection Date: 06/12/20 11:20
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603008-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Results of **HD 249-1**

Client Sample ID: **HD 249-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603009
Lab Project ID: 1202603

Collection Date: 06/12/20 11:35
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	10		1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603009-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Results of **HD 502-16 EOP**

Client Sample ID: **HD 502-16 EOP**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603010
Lab Project ID: 1202603

Collection Date: 06/12/20 12:05
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603010-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Results of **HD 1264-37**

Client Sample ID: **HD 1264-37**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603011
Lab Project ID: 1202603

Collection Date: 06/12/20 12:25
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.67	U	1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603011-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Results of **SHP 396-1**

Client Sample ID: **SHP 396-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202603012
Lab Project ID: 1202603

Collection Date: 06/12/20 11:17
Received Date: 06/12/20 14:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	885		1.67	1.67	col/100mL	1		06/12/20 16:40

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Analyst: VAB
Analytical Date/Time: 06/12/20 16:40
Container ID: 1202603012-A

Print Date: 06/17/2020 1:39:56PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1807582 [BTF/18170]
Blank Lab ID: 1563547

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1202603001, 1202603002, 1202603003, 1202603004, 1202603005, 1202603006, 1202603007, 1202603008, 1202603009, 1202603010, 1202603011, 1202603012

Results by **SM21 9222D**

Parameter	Results	LOQ/CL	DL	Units
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18170
Analytical Method: SM21 9222D
Instrument:
Analyst: VAB
Analytical Date/Time: 6/12/2020 4:32:00PM

Print Date: 06/17/2020 1:39:58PM

SGS

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CHAIN OF CUSTODY RECO

1202603

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virgina	Kentucky

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: HDR Inc.

CONTACT: Alena Gerlek PHONE NO: 907-310-0387

PROJECT NAME: Dry Weather Screening PROJECT/ PWSID/ PERMIT#: Profile #358860 4M

REPORTS TO: Alena Gerlek E-MAIL: alena.gerlek@hdr.com

INVOICE TO: HDR QUOTE #:

P.O. #: Dry Weather Screening

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: Fecal coliform	REMARKS/ LOC ID
1A	SHP 396-2-1	06/12/20	11:26	H_2O	1	G	x	
2A	SHP 96-2	06/12/20	11:54	H_2O	1	G	x	
3A	SHP 96-2 Dup	06/12/20	11:54	H_2O	1	G	x	
4A	SHP-245-1	06/12/20	12:20	H_2O	1	G	x	
5A	SHP491-1	06/12/20	12:50	H_2O	1	G	x	
6A	HD 609-218	06/12/20	10:28	H_2O	1	G	x	
7A	HD 486-1	06/12/20	11:15	H_2O	1	G	x	
8A	HD 486-1 Dup	06/12/20	11:20	H_2O	1	G	x	
9A	HD 249-1	06/12/20	11:35	H_2O	1	G	x	
10A	HD 502-16 EOP	06/12/20	12:05	H_2O	1	G	x	

Section 5

	Date	Time	
Relinquished By: (1) Alena Gerlek	6/12/2020	14:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	~~6/11/20~~ 6/12/20	14:00	Received For Laboratory By: RSC

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions: Please contact Alena Gerlek by phone w/ preliminary results as soon as possible as available (24 hours).

Temp Blank °C: 4.8 D57 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT HD

(See attached Sample Receipt Form)

[ ] 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

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CHAIN OF CUSTODY RECOI

1202603

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virgina	Kentucky

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: HDR Inc.

CONTACT: Alena Gerlek PHONE NO: 907- 310 - 0387

PROJECT NAME: Dry Weather screening PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Alena Gerlek E-MAIL: alena.gerlek@Hdrinc.com

INVOICE TO: HDR QUOTE #:

P.O. #: Dry Weather screening

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: Fecal Coliform	REMARKS/ LOC ID
(11A)	HD 1264-37	06/12/20	12:25	H2O	1	G	x	
(12A)								

Section 5

	Date	Time	
Relinquished By: (1) Alena Gerlek	6/12/20	14:00	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	~~6/11/20~~ 6/12/20	14:00	Received For Laboratory By: RJC

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions: (See first page)

Temp Blank °C: 4.8 D57

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) HD

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 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

e-Sample Receipt Form

SGS Workorder #: **1202603**

1202603

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 4.8 °C Therm. ID: D57
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	An extra sample "SHP 396-1" was received with other samples and not listed on COC.Proceeded to schedule sample with date & time per label.
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample 1A label does not match COC. Set as "SHP 2-1". Proceeded per matching date & time.

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1202603001-A	Na2S2O3 for Chlorine Redu	OK			
1202603002-A	Na2S2O3 for Chlorine Redu	OK			
1202603003-A	Na2S2O3 for Chlorine Redu	OK			
1202603004-A	Na2S2O3 for Chlorine Redu	OK			
1202603005-A	Na2S2O3 for Chlorine Redu	OK			
1202603006-A	Na2S2O3 for Chlorine Redu	OK			
1202603007-A	Na2S2O3 for Chlorine Redu	OK			
1202603008-A	Na2S2O3 for Chlorine Redu	OK			
1202603009-A	Na2S2O3 for Chlorine Redu	OK			
1202603010-A	Na2S2O3 for Chlorine Redu	OK			
1202603011-A	Na2S2O3 for Chlorine Redu	OK			
1202603012-A	Na2S2O3 for Chlorine Redu	OK			

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.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

Laboratory Report of Analysis

To: HDR Alaska, Inc.
2525 C Street #500
Anchorage, AK 99503
(907)644-2017

Report Number: **1202694**

Client Project: **Dry Weather Screening**

Dear Cynthia Helmericks,

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 Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **HDR Alaska, Inc.**
SGS Project: **1202694**
Project Name/Site: **Dry Weather Screening**
Project Contact: **Cynthia Helmericks**

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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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. The results apply to the samples as received. 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 <http://www.sgs.com/en/Terms-and-Conditions.aspx>. 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 (Provisionally Certified as of 6/02/2020 for Mercury by EPA200.8 and Turbidity by SM2130B) & Microbiology & 17-021 (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). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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.
B	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.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
SHP 396-1 Re	1202694001	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER 303-1	1202694002	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER 1335-1	1202694003	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER 1335-1 Dup	1202694004	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER #34	1202694005	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER 646-71	1202694006	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)
ER 1336-1	1202694007	06/16/2020	06/16/2020	Water (Surface, Eff., Ground)

Method	Method Description
SM21 9222D	Fecal Coliform (MF)

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Detectable Results Summary

Client Sample ID: **SHP 396-1 Re**
Lab Sample ID: 1202694001
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	1020	col/100mL

Client Sample ID: **ER 1335-1**
Lab Sample ID: 1202694003
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	32	col/100mL

Client Sample ID: **ER 1335-1 Dup**
Lab Sample ID: 1202694004
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	30	col/100mL

Client Sample ID: **ER 646-71**
Lab Sample ID: 1202694006
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	1.0	col/100mL

Client Sample ID: **ER 1336-1**
Lab Sample ID: 1202694007
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	4.0	col/100mL

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Results of **SHP 396-1 Re**

Client Sample ID: **SHP 396-1 Re**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694001
Lab Project ID: 1202694

Collection Date: 06/16/20 12:25
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1020		20.0	20.0	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694001-A

Print Date: 06/19/2020 1:45:51PM

J flagging is activated

Results of **ER 303-1**

Client Sample ID: **ER 303-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694002
Lab Project ID: 1202694

Collection Date: 06/16/20 13:20
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.00	U	1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694002-A

SGS North America Inc.
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Results of **ER 1335-1**

Client Sample ID: **ER 1335-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694003
Lab Project ID: 1202694

Collection Date: 06/16/20 13:45
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	32		1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694003-A

SGS North America Inc.
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t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **ER 1335-1 Dup**

Client Sample ID: **ER 1335-1 Dup**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694004
Lab Project ID: 1202694

Collection Date: 06/16/20 13:50
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	30		1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694004-A

Results of **ER #34**

Client Sample ID: **ER #34**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694005
Lab Project ID: 1202694

Collection Date: 06/16/20 14:20
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.00	U	1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694005-A

SGS North America Inc.
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Results of **ER 646-71**

Client Sample ID: **ER 646-71**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694006
Lab Project ID: 1202694

Collection Date: 06/16/20 14:30
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.0		1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694006-A

SGS North America Inc.
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Results of **ER 1336-1**

Client Sample ID: **ER 1336-1**
Client Project ID: **Dry Weather Screening**
Lab Sample ID: 1202694007
Lab Project ID: 1202694

Collection Date: 06/16/20 15:00
Received Date: 06/16/20 15:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	4.0		1.00	1.00	col/100mL	1		06/16/20 20:09

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 06/16/20 20:09
Container ID: 1202694007-A

Print Date: 06/19/2020 1:45:51PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1807718 [BTF/18181]
Blank Lab ID: 1563962

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1202694001, 1202694002, 1202694003, 1202694004, 1202694005, 1202694006, 1202694007

Results by **SM21 9222D**

Parameter	Results	LOQ/CL	DL	Units
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18181
Analytical Method: SM21 9222D
Instrument:
Analyst: A.A
Analytical Date/Time: 6/16/2020 8:09:54PM

Print Date: 06/19/2020 1:45:54PM

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECOR

1202694

www.us.sgs.com

Instruction ... be filled out.
Omission... may delay the onset of analysis.

Section 1

CLIENT: HDR Inc.

CONTACT: Alena Gerlek — PHONE #: 907-310-0387

PROJECT NAME: Dry Weather Screening — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Alena Gerlek — E-MAIL: alena.gerlek@hdrinc.com — Profile #: 358860

INVOICE TO: HDR — QUOTE #: — P.O. #: Dry Weather Screening

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*: Fecal Coliform									REMARKS/LOC ID
1A	SHP 396-1 Re	06/16/20	12:25	H2O	1	G	x									
2A	ER 303-1	06/16/20	13:20	H2O	1	G	x									
3A	ER 1335-1	06/16/20	13:45	H2O	1	G	x									
4A	ER 1335-1 Dup	06/16/20	13:50	H2O	1	G	x									
5A	ER # 34	06/16/20	14:20	H2O	1	G	x									
6A	ER 646-71	06/16/20	14:30	H2O	1	G	x									
7A	ER 1336-1	06/16/20	15:00	H2O	1	G	x									

Section 3 — Preservative

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

Relinquished By:	Date	Time	Received By:
(1) Kacy Gardner	06/16/20	15:35	
(2)			
(3)			
(4)	6/16/20	15:39	Received For Laboratory By: RJC

Section 4 — DOD Project? Yes (No)

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:
Please contact Cindy Helmericks 907-644-2017 with preliminary results as soon as available (within 24 hours).

Temp Blank °C: 5.6 D65 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT) HD

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: **1202694**

1202694

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 5.6 °C Therm. ID: D65
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1202694001-A	Na2S2O3 for Chlorine Redu	OK			
1202694002-A	Na2S2O3 for Chlorine Redu	OK			
1202694003-A	Na2S2O3 for Chlorine Redu	OK			
1202694004-A	Na2S2O3 for Chlorine Redu	OK			
1202694005-A	Na2S2O3 for Chlorine Redu	OK			
1202694006-A	Na2S2O3 for Chlorine Redu	OK			
1202694007-A	Na2S2O3 for Chlorine Redu	OK			

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.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

Appendix F

Ship Creek Outfall 396-1 Follow-Up Report

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2020 Dry Weather Screening - Fecal Coliform Detection Follow-up
Ship Creek Outfall 396-1

The MOA Watershed Management performed two follow-up visits to determine whether bacteria present during Dry Weather Screening were due to an Illicit Discharge. The Dry Weather results were:

Sample Location	Date of Collection	Fecal Coliform (cfu/100mL)
Outfall 396-1 to Ship Creek (north bank under A St. Bridge)	June 12, 2020	885
	June 16, 2020	1020

The first follow-up visit, conducted August 7th, checked the outfall and researched the contributing flow area. Due to the age and industrial nature of the development there is a fair amount of uncertainty about specific contributing areas to the outfall and the existence and direction of pipes. The upgradient area was walked to check for dry weather flows. At the time of the visit there were no indicators of contributing surface flows from any area upgradient to the outfall. A decision was made to perform a second day of investigation including sampling to eliminate the possibility of contamination from flows in the residential areas of Government and Hollywood Hills where there is a known spring flowing from the hillslope.

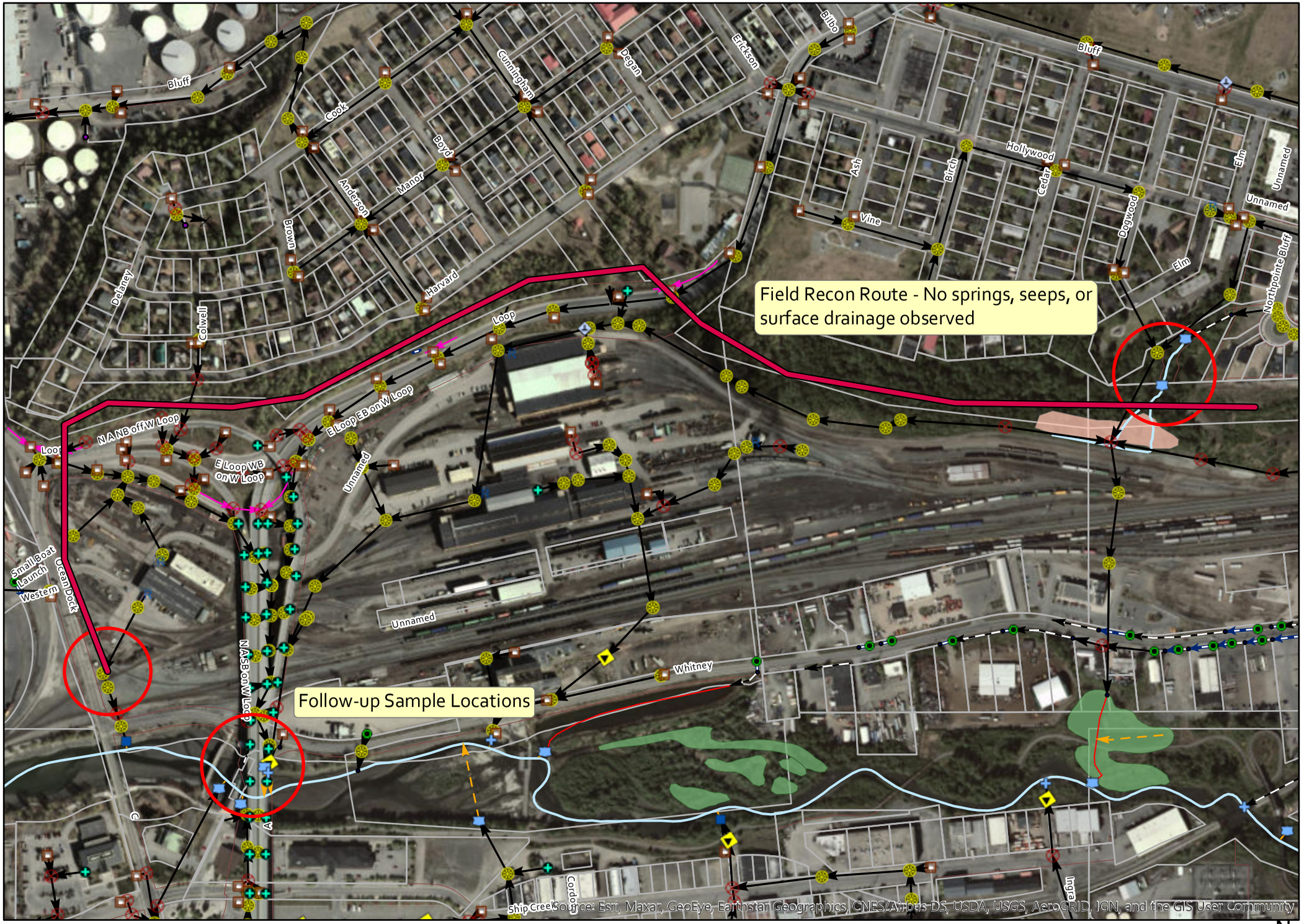
The second day of investigation repeated the earlier inspection starting from the outfall and moving upgradient along the bluff to check accessible storm sewer inlets for evidence of dry weather flows. Samples were taken at the only sites with water present - the outfall, an inlet in a storm sewer line on Alaska Railroad property, and along the bluff where a spring seep is believed to contribute water to the storm line. A map of the sampling locations and investigation area is attached. The results are attached and summarized below:

Sample Location	Date of Collection	Fecal Coliform (cfu/100mL)
RRX Storm Drain*	10/08/2020	undetected
Ship Creek Outfall	10/08/2020	30
Sunset/Solar Hill Slope	10/08/2020	undetected

*Storm sewer was found to be disconnected from Outfall 396-1

Based on the results of the sampling and drainage area investigations, WMS believes the flows were caused by ground water infiltration to the storm sewer, and the bacteria levels observed during the summer of 2020 were caused by bacteria growth in a sediment control system (sandbags placed inside the grated culvert). As a result, maintenance crews will be asked to remove or replace the sandbags and we will resample the outfall next season (2021) as part of dry weather screening activities.





2020 Dry Weather Sampling

0 500 1,000 2,000 3,000 4,000 US Feet

N

Laboratory Report of Analysis

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

Report Number: **1205577**

Client Project: **OW-ShipFollowUp**

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 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 Date
Project Manager
Justin.Nelson@sgs.com

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: **1205577**
Project Name/Site: **OW-ShipFollowUp**
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. The results apply to the samples as received. 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 <http://www.sgs.com/en/Terms-and-Conditions.aspx>. 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) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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.
B	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
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Post Road RRX SD	1205577001	10/08/2020	10/08/2020	Water (Surface, Eff., Ground)
Ship Creek Outfall	1205577002	10/08/2020	10/08/2020	Water (Surface, Eff., Ground)
Sunset Solar Hill	1205577003	10/08/2020	10/08/2020	Water (Surface, Eff., Ground)

Method	Method Description
SM21 9222D	Fecal Coliform (MF)

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Detectable Results Summary

Client Sample ID: **Ship Creek Outfall**
Lab Sample ID: 1205577002
Microbiology Laboratory

Parameter	Result	Units
Fecal Coliform	30	col/100mL

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Results of **Post Road RRX SD**

Client Sample ID: **Post Road RRX SD**
Client Project ID: **OW-ShipFollowUp**
Lab Sample ID: 1205577001
Lab Project ID: 1205577

Collection Date: 10/08/20 13:30
Received Date: 10/08/20 16:09
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.64	U	1.64	1.64	col/100mL	1		10/08/20 17:23

Batch Information

Analytical Batch: BTF18438
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 10/08/20 17:23
Container ID: 1205577001-A

Print Date: 10/13/2020 8:53:43AM

Results of **Ship Creek Outfall**

Client Sample ID: **Ship Creek Outfall**
Client Project ID: **OW-ShipFollowUp**
Lab Sample ID: 1205577002
Lab Project ID: 1205577

Collection Date: 10/08/20 14:15
Received Date: 10/08/20 16:09
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	30		1.64	1.64	col/100mL	1		10/08/20 17:23

Batch Information

Analytical Batch: BTF18438
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 10/08/20 17:23
Container ID: 1205577002-A

Print Date: 10/13/2020 8:53:43AM

Results of **Sunset Solar Hill**

Client Sample ID: **Sunset Solar Hill**
Client Project ID: **OW-ShipFollowUp**
Lab Sample ID: 1205577003
Lab Project ID: 1205577

Collection Date: 10/08/20 15:40
Received Date: 10/08/20 16:09
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Fecal Coliform	1.64	U	1.64	1.64	col/100mL	1		10/08/20 17:23

Batch Information

Analytical Batch: BTF18438
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 10/08/20 17:23
Container ID: 1205577003-A

Print Date: 10/13/2020 8:53:43AM

Method Blank

Blank ID: MB for HBN 1812788 [BTF/18438]
Blank Lab ID: 1586561

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205577001, 1205577002, 1205577003

Results by **SM21 9222D**

Parameter	Results	LOQ/CL	DL	Units
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18438
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L
Analytical Date/Time: 10/8/2020 5:23:12PM

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SGS

SGS North America Inc.
CHAIN OF CUSTODY RECOR
PWSID sampling for submittal to ADE

1205577

Locations Nationwide
Alaska Maryland
New Jersey New York
North Carolina Florida

www.us.sgs.com

p# 544 AD

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 1

CLIENT: MOA - Watershed Mgt
CONTACT: Kristi Bischofberger PHONE #:
PROJECT NAME: OV/-ShipFollowUp PROJECT/ PERMIT#:
REPORTS TO: Kristi Bischofberger E-MAIL: kristi.bischofberger@anchorageak.
INVOICE TO: // Profile #: QUOTE #: gov
P.O. #:

Section 3

Preservative

Section 2

RESERVED for lab use	Sample Location	Date of Collection	Time of Collection	# CONTAINERS	Comp / Grab	Analysis: Fecal Col.	PWSID#	FAC ID #	Sample Pt. ID
1A	Post Rond RRX SD	1/8/2020	130 pm	1	V	↓			RRX
2A	Ship Creek Outfall	↓	215 pm	↓	↓	↓			Ship
3A	Sunset & Solar Hill		340 pm						Hill

Info Required for ADEC Submittal - Missing or incorrect info may result in a delay. Information may be found on your ADEC Monitoring Summary.

Section 5

	Date	Time	
Relinquished By: (1)	10/8/20	4:08 pm	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	10/8/20	16:09	Received For Laboratory By:

Section 4

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 11.4 D23 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: 1205577

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
Yes **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	No	Cooler ID: 1 @ 11.4 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	Yes	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	Collection date "1/8/20".Proceeded with "10/08/20".
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020B).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1205577001-A	Na2S2O3 for Chlorine Redu	OK			
1205577002-A	Na2S2O3 for Chlorine Redu	OK			
1205577003-A	Na2S2O3 for Chlorine Redu	OK			

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.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.