July 2021 through December 2023
Groundwater Remediation
Sterling ZipMart, 38525 Swanson River Road
Sterling, Alaska

December 2023

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Since 1954.

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1.0 INTRODUCTION

This report presents the results of Shannon & Wilson, Inc.'s (Shannon & Wilson's) groundwater remediation efforts conducted between July 1, 2021, and December 31, 2023, at and in the vicinity of the former Sterling ZipMart, located at 38525 Swanson River Road, Sterling, Alaska. The project scope included operation, monitoring, and maintenance of the active remediation systems.

This work was conducted under Shannon & Wilson's Alaska Department of Environmental Conservation (ADEC) Division of Spill Prevention and Response Term Contract No. 18-3012-18. ADEC authorization was received with Notice to Proceed (NTP) Number 18*996, signed by Jacqelli Ziegenfuss on May 24, 2021. The work was conducted in consultation with the ADEC Project Manager Ms. Lisa Krebs-Barsis. General operation and monitoring procedures are outlined in the *Fiscal Year 2014 Operations* work plan prepared by Shannon & Wilson dated October 2013.

2.0 SITE DESCRIPTION

The former ZipMart convenience store is located at 38525 Swanson River Road, approximately 800 feet north of the Sterling Highway, in Sterling, Alaska. The project site has expanded with the extent of gasoline contamination to include an east-southeast trending area approximately 800 feet wide and 3,000 feet long from the ZipMart property north of the Sterling Highway to Barbara Street south of the Sterling Highway. The project area and approximate property boundaries are shown in Figure 1. Figure 1 includes groundwater elevation contours and estimates of benzene extent from the Fiscal Year (FY) 2021 monitoring efforts. The ADEC File number for the site is 2334.26.007, and the ADEC RecKey number is 199523002851.

3.0 BACKGROUND

ZipMart was a vehicle fueling station that began operations in 1985. Whittier Properties, Inc., d.b.a. ZipMart, owned and operated the regulated underground storage tank (UST) systems between April 1990 and December 2000. Low levels of soil and shallow groundwater contamination were identified during a tank upgrade in 1995. In December 2001, a site assessment encountered gasoline-contaminated soil in soil borings and 13 inches of fuel in groundwater monitoring wells at the ZipMart property. A break in the gasoline tank fill pipe of

the 1995 ZipMart UST was identified as the root cause of the release. It was estimated that 53,000 gallons of fuel were released to the environment based on delivery, inventory, and sales tracking. The State of Alaska has assumed management of cleanup activities related to the ZipMart UST systems.

To characterize, remediate, and monitor the fuel release, over 110 monitoring wells, 17 product recovery wells, 22 air sparging wells, 7 well points, and 7 soil gas points have been installed at the ZipMart property and vicinity. The extent of liquid-phase fuel (often referred to as product or free product, but technically a lighter-than-water non-aqueous phase liquid [LNAPL]) has been characterized. LNAPL recovery efforts have resulted in the removal of more than 18,000 gallons of liquid gasoline from the water table. Locations of drinking water wells, recovery wells, monitoring wells, and remediation systems are depicted in Figure 1. A measurable thickness of LNAPL was last observed in 2011, in Monitoring Well MW7.

The regional unconfined aquifer is used by many of the water wells in the immediate area. Thirteen drinking water wells have been monitored for gasoline constituents. Between 2002 and 2005 benzene was detected in the B&D Auto/Denny's Auto Body well at concentrations that exceed the drinking water standard. The Sterling Elementary School and Sterling Lutheran Church installed new, deeper water wells at locations further from the release. Limited indoor air and soil vapor sampling has been performed to monitor gasoline vapor migration.

The LNAPL recovery system, located on the Sterling Community Club property, was modified to a soil vapor extraction (SVE) system that began operation in the spring of 2005 to remove contaminants from the subsurface in the vapor phase. The SVE system was operated with a thermal oxidizer to combust the hydrocarbon constituents until June 2006. The system was modified to vent vapors directly to the atmosphere in August 2006. In the spring of 2007, one SVE blower was moved to the east of Swanson River Road to recover vapors from Wells MW7 and MW40. This SVE blower was moved to the ZipMart property to recover vapors from source area wells in November 2010.

In April 2009, 1,600 pounds of ORC Advanced® oxygen releasing compound (ORC) were mixed into a slurry and pumped into 20 reusable injection wells located down-gradient (southeast) of nested Well MW45N. In August and September 2011, approximately 5,000 pounds of ORC were injected into the subsurface along two transects. One transect used the April 2009 injection wells as conductor casing to inject ORC at greater depths. The other transect followed the property line of Government Lots 8 and 9 between Wells MW44N and MW51N.

In May 2009, the ZipMart 20,000-gallon three-compartment UST was decommissioned and over 750 tons of petroleum-impacted soil were removed from the UST site. Prior to backfilling, soil in the bottom of the UST excavation was treated with 600 pounds of ORC and 1,740 pounds of RegenOx™ chemical oxidizer. Slotted 4-inch pipe was laid horizontally during the backfill of the excavation to provide passive soil ventilation. A shallow perched aquifer is present at the former location of the UST. The piping was set approximately 7 feet below ground surface (bgs), and subsequently flooded with water from the perched aquifer. A seasonal pump and treat system that pulls groundwater from the flooded vent piping has been operated since the summer of 2013. A feasibility study in June 2015 included applying 40 pounds of ORC as slurry in each of 29 boreholes advanced into the shallow perched aquifer east of the UST excavation.

An air injection/sparging (AS) pilot study was conducted using Recovery Wells RW3 and RW16 in June and July of 2010. From October 2010 through February 2011 a new AS system with ten wells was installed to enhance in-situ remediation on the ZipMart property (the N.AIS), and six recovery wells on the Community Club property were modified for AS (the S.AIS). In December 2012, 14 AS wells (located between Monitoring Wells MW13 and MW37) and a compressor shed were installed on the Sterling Baptist Church property east of Swanson River Road. The eastern AS system (E.AIS) was initially operated intermittently in the winter and continuously during the warmer months. Modifications made to the E.AIS in 2014 allow continuous operation through the winter.

4.0 PROJECT OVERVIEW

The ZipMart monitoring and remediation project has the overall objective of reducing potential risks to human health or the environment. The work presented in this report included the following tasks and objectives:

- operate, maintain, and monitor the SVE and AS remediation systems on the ZipMart, Community Club, and Sterling Baptist Church properties to enhance attenuation of contaminants;
- operate a seasonal pump and treat system (late summer 2022) to remove contaminant mass from the perched aquifer in the source area; and
- dispose of investigation-derived waste (IDW).

Due to budgeting issues and at the request of the ADEC, groundwater and drinking water monitoring were not performed during the July 2021 through December 2023 reporting period.

5.0 REMEDIATION SYSTEMS OPERATION AND MONITORING

The remediation systems include the SVE system, AS systems at three locations, and a seasonal pump and treat (P&T) system. Field visits to the remediations systems were conducted by Shannon & Wilson 26 times during the July 2021 to December 2023 reporting period. Field visits included general inspections for damage and safety hazards and observation of system function. Some visits included field measurements, analytical sampling, and maintenance work. Operation of the remediation systems included maintaining electrical service through three meters with Homer Electric Association (HEA). Restoring alternating current electricity to the northern portion of the remediation systems was a significant operational effort in 2023.

5.1 Restoration of Electrical Service

The building that housed the Sterling ZipMart convenience store has been abandoned for years. Between April 13 and April 25, 2023, the building collapsed under snow load. See Photo 1 in Appendix A. The electrical power for the northern remediation systems was supplied by HEA through a meter mounted on the south wall of the building. The telephone line that connected the remediation system remote monitoring to the internet was also mounted on the south wall. When the building collapsed, the overhead power line sagged into McCall Road and HEA disconnected the powerline. Also due to safety considerations, the Kenai Peninsula Borough (KPB) Assembly authorized funds to demolish and dispose of the aboveground portion of the former ZipMart building. The demolition was completed in July of 2023.

The N.AIS, SVE, remote monitoring, and P&T were out of service once electrical service was disconnected. In May 2023 Shannon & Wilson started working with HEA to re-establish electrical service to the remediation system. HEA's tariff is such that they own the electrical facilities up to the meter. HEA was unwilling to install a meter on an abandoned property without an easement signed by the landowner. In consultation with KPB and HEA it was agreed to install a pole and meter base within KPB's McCall Road right-of-way. In July 2023 Shannon & Wilson paid the engineering fee and signed an agreement with HEA, as well as contracting Peninsula Surveying LLC to reestablish the corners of the ZipMart lot (Lot 9A, Sterling Heights Subdivision) so that the southern boundary and right-of-way were clearly marked.

Once HEA completed the engineering and provided cost estimate for installation, Shannon & Wilson contracted Big G Electric and Engineering, LLC (Big G) to provide a meter drop assembly and connect the new meter to the northern remediation system with an underground electric line. The underground line was installed to the planned location of the meter pole on September 28, 2023. Photos 2 and 3 in Appendix A show the underground installation. The

pole, overhead line, and meter were installed by HEA on October 10, 2023. Big G connected the underground line to the meter and the SVE and N.AIS were restarted on October 13, 2023.

Connection through cellular phone towers was selected to reestablish remote communication with the data loggers monitoring the ZipMart remediation systems. A cellular Long Term Evolution (LTE) router with data provisioning over the AT&T network was purchased from Campbell Scientific, Inc. The router (See Photo 4 in Appendix A) and an LTE antenna were installed on September 28, 2023, but communication with the primary CR1000 data logger (using battery power) was not established until October 5, 2023, when the CR1000 operating system could be updated and the monitoring program reloaded.

5.2 SVE System

SVE Blower 2 (Blower 2), located on the ZipMart property, was operated in continuous mode during the reporting period. SVE system field readings, actions, and observations are summarized in Table 1. Blower 2 was not operating during two extended power outages. The first was from October 30 to December 16, 2022, due to unauthorized tampering with the circuit breakers at the south wall of the former ZipMart building. The second was roughly April 14 to October 13, 2023, due to the collapse of the former ZipMart building. Frost damage to the wellhead of Remediation Well RW1 and fouling of the well screen near the water table of RW2 impacted SVE efficiency in 2022. A broken well cap on RW1 was replaced. Scrubbing the RW2 well screen with a well brush provided some improvement in air flow. Vapors from sampling ports on the exhaust of Blower 2 and on piping from active vapor extraction wells were measured during eight visits over the reporting period. A flame ionization detector (FID) and at times a photoionization detector (PID) were used to measure total volatile hydrocarbon concentrations. A multi-sensor gas monitor was used to measure lower explosive limit (LEL) and oxygen levels.

Vapor sample VEZ41 was collected for laboratory analysis from the Blower 2 exhaust sample port on November 6, 2021. VEZ41 was collected in a 1-liter SUMMA® canister provided by Eurofins Air Toxics, LLC. (Air Toxics) of Folsom, California. Analytical sample collection is noted with field monitoring data in Table 1. Laboratory results are summarized in Table 2.

Based on remote monitoring data after October 13, 2023, until December 23, 2023, the SVE system has run continuously except for two power outages of less than 2.5 hours each. After the second power outage on November 15, the vacuum level climbed from under 33 inches of water to over 38 inches of water around November 20. The vacuum readings have slowly declined to

the 28 to 30-inches of water range in December. Frost accumulation in the lines until the snowpack built up enough to insulate the ground is a likely explanation.

5.3 Air Injection Systems

Compressor operating hours, flow rates, and pressures on the AS lines were documented and occasionally adjusted during the monitoring period. Adjustments to the AS systems were generally performed to balance the flow rates between the different AS wells and optimize system air pressure. Routine maintenance, including lubricating motor bearings, swapping and cleaning filters, inflating well packers, and changing transducer desiccant were performed based on operation time and observed conditions. Repairs were performed as needed. Summaries of AS system observations, readings, maintenance, and corrective actions are presented in Table 3. Based on remote monitoring data, the N.AIS, S.AIS, and E.AIS have been running within acceptable ranges since October 13, 2023, except for the two power outages mentioned above.

5.3.1 North AS

The N.AIS on the ZipMart property injects air into 10 wells, switching from five odd-numbered wells to five even-numbered wells every three hours. When the P&T system is operating, the airlines to Wells ASW7 and ASW8 are disconnected and used to aerate the groundwater holding tank, typically during two to four periods over the summer. The system was monitored during 24 visits between July 1, 2021, and October 13, 2023. The first portion of Table 3 summarizes flow and pressure readings, hours of operation, and maintenance performed for the N.AIS.

Three power outages reduced the amount of time sparging. The first was a 5.5-hour outage on December 28, 2021, at the end of which the main timer failed to restart the system, leaving the system off until December 30, 2021. The second was from October 30 to December 16, 2022, due to the unauthorized circuit breaker tampering. For the 658 days between June 24, 2021, and April 13, 2023, the hour meter tracking the compressor current indicates that the system was not operating for 49 days, or less than 8% down time. The third outage was roughly April 14 to October 13, 2023, due to the collapse of the former ZipMart building.

The rotary vane air compressor running the N.AIS failed and was replaced two times over the monitoring period. Both electronic switching timers failed at different times over the reporting period. The well switching timer was replaced, and the main timer was modified for manual switching. The well packers that separate the lower part of the well (where air injection occurs) from the water table (where vapor extraction occurs) were replaced in Wells RW1 and

RW2 due to leakage. The replacement packers had a different type of lower air fitting that we found difficult to seal, resulting in additional maintenance over the reporting period. The datalogger that records N.AIS and SVE monitor readings, collects data from the loggers at the S.AIS, and E.AIS, and communicates to the internet is located in the N.AIS shed. Modifications to this monitoring system are summarized in Section 5.1 above and in Table 3.

5.3.2 South AS

The S.AIS is located on the Sterling Community Club property and has air lines to six wells. Two of these wells (RW7 and RW16) are out of use. Page 2 of Table 2 summarizes the operation and maintenance of the S.AIS. The wells RW9, RW15, RW3, and RW12 were being run on an intermittent 4-hour on, 4-hour off schedule. The timer for intermittent operation failed in August 2021 in the on mode. A used timer from part of the SVE system was substituted for the failed timer on September 14, 2021, but it failed in a matter of hours in the off position. Five days later the repaired original timer was installed. On August 15, 2022, the timer was set to a 4-hour on, 2-hours off to increase aeration time with a lower output compressor. The timer failed in continuous-on mode a few hours later. A new timer was installed on September 16, 2022, and set to run 4-hours on, 2-hour off schedule. Communication between the S.AIS data logger and the main CR1000 data logger was lost at the end of October 2021 and restored on November 18, 2021. The AC adaptor for the S.AIS datalogger failed in January 2023. The logger battery was charged with a separate charger and the logger operated until March 7. A new AC adaptor was installed on April 13, 2023.

The rotary vane compressor designated E2 was running well in the S.AIS since October 2020. When the compressor in the N.AIS failed in July 2022, Compressor E2 was moved to the N.AIS and the weak, low output compressor E1 was installed in the S.AIS. On December 16, 2022, compressor E1 was found with the motor running but the compressor not spinning. The Spare compressor was installed in the S.AIS and the drive link between the motor and compressor of E1 was repaired in Anchorage. The E1 compressor was re-installed in the S.AIS on January 28, 2023.

On December 15, 2021, Well RW15 was found to have no air flow. The well packer and air diffuser assembly was pulled from the well and a new air diffuser was installed. The RW15 air diffuser began fouling again in the early winter of 2022, and by January 28, 2023, the well had no air flow. After a failed attempt in May, the RW15 well packer was successfully pulled, and a new diffuser installed on June 27, 2023. The air diffuser in Well RW12 appeared to be fouling in October 2023. The air temperature had dropped too low to pull the well packer on the evening of October 13, 2023.

5.3.3 East AS

The E.AIS on the Sterling Baptist Church property was operated in continuous mode during the reporting period. The E.AIS has two rotary vane compressors that inject air into 14 sparge wells. Page 3 of Table 3 summarizes the operation and maintenance of the E.AIS. Maintaining airflow through Well ASW10 has continued to be difficult. The well screen is under roughly 1 foot more water than the other E.AIS ASWs and is in heaving fine sand. Often the southern seven wells need to be closed at the piping 'T' to get pressure for breakthrough and air flow at ASW10. Wells ASW 10 and ASW13 are the most prone to accumulating condensate water in their flow meters.

Air pressure leaks around compressor outlet filter cannisters were identified on September 9, 2021. The deformed aluminum cannisters were replaced with glass cannisters covered with reinforcing tape on September 20, 2021. The vanes of the compressor in position #2 failed during a monitoring visit on October 18, 2021. The recently rebuilt compressor removed from the N.AIS was installed in position #2. The weak, low output compressor in position #1 was replaced with the rebuilt compressor from #2 on December 20, 2021. The vanes in the #1 compressor failed in late September 2023. The compressor named Spare was installed in the #1 position on October 5, 2023.

On June 27, 2023, the outer pump fan on #2 and the motor cooling fan on #1 were found to have failed, leaving plastic shavings throughout the shed. The outer pump fan from the Spare compressor was installed on compressor #2, and a new spare motor fan was installed on #1. Three broken plastic wellhead covers were replaced, and three trees of less than 6-inch diameter were removed from across the piping in 2023. Rodents have chewed up a number of wellhead insulating covers. Woven polypropylene 'sandbags' were used to help hold the insulation together over the wellheads until alternate insulation can be obtained.

5.3.4 Pump & Treat System

The P&T System was assembled and started on May 4, 2021, for the Summer 2021 season. Because the 2021 P&T operating season extended into November 2021, the results were not presented in the Fiscal Year 2021 Monitoring and Remediation report. Analytical sample results and pumping/discharge history for the operation of the P&T system over the summer of 2021 are included in Table 4. Funding came in place for the P&T system to be operated in July of 2022. Table 5 summarizes the analytical sample results and pumping/discharge history for the 2022 season. Details of the system layout and operation are included in the *Fall 2013 Monitoring and Remediation* report finalized by Shannon & Wilson in April 2014.

The P&T system was operated between May 4 and November 7, 2021. The holding tank was filled to the cut-off level and drained two times (June and September 2021) and partially filled again before being drained on November 3 and disassembled on November 7, 2021. The holding tank was drained through two 50 micrometer particulate filters and a 55-gallon drum of granular activated carbon (GAC) to discharge into Well MW4. Approximately 41,940 gallons of petroleum-impacted water were removed from the perched aquifer during the 2021 season. The groundwater pump did not restart after a September 29, 2021, power outage. The lead wires at the pump head were reworked to remove corrosion on October 7, 2021. The pump was overhauled during the winter of 2021-2022. Despite cracking due to exposure to gasoline, the pump diaphragm and valve bodies functioned through the 2022 operating period.

The P&T system was operated between July 28 and October 21, 2022. The holding tank was filled to the cutoff level once and to approximately 84 percent capacity once before draining on October 19 and disassembly on October 21, 2022. The steel filter drum for GAC was found to be perforated with rust holes when starting to drain the holding tank in September 2022. A salvaged plastic 55-gallon drum was set up as a filter drum with new GAC. The top of the plastic drum was found to flex under pressure and vacuum during use, requiring modification of the lid and extra effort to prevent leaks. Approximately 33,430 gallons of petroleum-impacted water were removed from the perched aquifer during 2022.

Samples of the groundwater entering the holding tank were collected three times during both the 2021 and 2022 P&T operation. Samples of the water in the holding tank during aeration were collected three times in 2021 and twice in 2022. Groundwater samples were collected directly from the tubing at the point of discharge to the holding tank and are designated UVxx. Samples from inside the holding tank were collected with a dedicated polyethylene bailer and are designated HTxx. Samples of the post-treatment water (designated TWDxx) were collected at the point of discharge to Well MW4. TWDxx samples were collected three times in 2021 and twice in 2022, each after water was discharging from the GAC for at least 45 minutes. Based on the laboratory results for sample TWD12 (September 2021), it was thought that the GAC used to remove residual hydrocarbons was reaching the end of its useful life. A composite sample of the GAC (Sample 100972-GAC21) was collected on November 6, 2021, from multiple locations as the material was transferred from the filter drum into a labeled open-top drum for storage and disposal.

6.0 LABORATORY ANALYSIS

Water samples were delivered to SGS North America Inc. (SGS) in Anchorage, Alaska following chain-of-custody procedures. Water samples from the P&T system (nine in 2021 and

seven in 2022) were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101 and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Solid Waste Method (SW) 8021B. One sample of GAC was delivered the SGS for GRO and BTEX analyses, plus benzene analysis by the toxicity characteristic leaching procedure (TCLP) and EPA Method SW8260D.

One vapor sample was shipped to Air Toxics via air cargo following chain-of-custody procedures for analysis of BTEX and total petroleum hydrocarbons (TPH) as gasoline by Modified EPA Method TO-3. Laboratory reports for P&T water samples are included in Appendix B. The vapor sample laboratory report is in Appendix C.

7.0 DISCUSSION OF RESULTS

The results of the field activities are discussed primarily in terms of field testing and laboratory results. Field notes are included in Appendix D.

7.1 Remediation Systems Monitoring

7.1.1 SVE System

SVE system field measurements and readings for the July 2021 through December 2023 reporting period are presented in Table 1 along with two earlier readings to include Sample VEZ40. The recovery of volatile hydrocarbons from soil vapor was impacted by various power outages and equipment failure during the reporting period. The average of five FID readings across a fairly stable period between July 9, 2021, and July 19, 2022, is 7.7 parts per million (ppm). The average of the FID readings for the FY21 reporting period, after removing an outlier, was 12.4 ppm, suggesting a 38 percent reduction in vapor recovery. Vapor Samples VEZ40 and VEZ41 were collected from the exhaust of the SVE system in May 2021 and November 2021, respectively, for laboratory analysis by Air Toxics. The laboratory report for Sample VEZ40 is in the FY21 Monitoring Report, but both sample results are summarized in Table 2. The TPH (as gasoline) of 5.5 ppm by volume in Sample VEZ41 is approximately 24 percent less than the 7.2 ppm TPH measured in Sample VEZ40. The ratio of benzene to TPH (as gasoline) continues a slowly increasing trend. Oxygen concentrations in the soil vapor ranged from 19.0 to 20.9 percent, and LEL measurements (calibrated to methane) ranged from zero to 2 percent over the reporting period.

Gasoline vapors remain in the subsurface, and the FID readings collected while the remediation system was recovering from repairs provide some insight into the dynamic system. On August 15, 2022, Well RW1 was repaired after a period of being open to the air and then

capped. The initial FID reading after repair was 10 ppm, and the concentration increased to 20 ppm while the system was being optimized for flow and recovery. On October 13, 2023, electrical power was restored to the northern remediation system after 6 months out of service. Before the AS system was started the initial FID reading for Blower 2 was 20 ppm. The vapor concentration climbed to 45 ppm over 26 minutes while the AS system was being prepared for restart. Two hours after starting the N.AIS, with the even numbered AS wells active, the FID reading from Blower 2 was 175 ppm.

The amount of hydrocarbons recovered as vapor can be estimated based on the analytical results, the Ideal Gas Law, flow rates and typical constants for gasoline. Estimates are included at the bottom of Table 2. For the period of May 6 to November 6, 2021, the estimate of 7.1 gallons of gasoline removed from the subsurface was calculated from the average of the TPH recovery rates for Samples VEZ40 and VEZ41 multiplied by 184 days. Approximately 4.9 pounds of benzene were removed over the same 6-month period. Using the recovery rates for Sample VEZ41 only over the period of November 6, 2021, to the October 30, 2022 power outage, we estimate that 12 gallons of gasoline and 8.8 pounds of benzene were recovered. Analytical vapor samples were not collected in 2022 or 2023, making an estimate of hydrocarbon recovery during the December 16, 2022 to April 13, 2023 operational period less reliable. Using the Sample VES41 recovery rates, approximately 4 gallons of gasoline and 2.9 pounds of benzene were recovered. Adding the three periods of estimation results in approximately 23 gallons of gasoline and 17 pounds (roughly 2 gallons) of benzene recovery over the reporting period. These estimates do not take into account the higher concentrations typically removed after a re-start of the SVEsystem.

7.1.2 AS System

During past reporting periods, dissolved oxygen (DO) concentrations in groundwater and GRO and BTEX results from monitoring wells near the AS systems have been reviewed to assess system performance. Groundwater sampling was not included in this reporting period.

7.1.3 Pump & Treat System

Tables 4 and 5 summarize the laboratory results and operation of the P&T system in 2021 and 2022, respectively. Approximately 41,940 gallons of water were pumped from the aquifer between May 4 and November 3, 2021, based on water depths in the holding tank. Three samples of groundwater were collected at the point of discharge to the holding tank (Samples UV11, through UV13). The GRO concentrations ranged from 40.8 milligrams per liter (mg/L) to 79.8 mg/L. Benzene concentrations ranged from 2.71 mg/L to 5.50 mg/L. By using the

numerical averages of the three laboratory results and the volume of water removed, approximately 21 pounds of gasoline and 1.5 pounds of benzene were removed from the aquifer in 2021.

Approximately 33,429 gallons of water were pumped from the aquifer between July 28 and October19, 2022. Samples UV21, UV22, and UV23 were collected from groundwater discharging to the holding tank. The GRO concentrations ranged from 62.2 mg/L to 97.2 mg/L, and the benzene concentrations ranged from 2.72 mg/L to 9.48 mg/L. Using the numerical averages of the analytical results and the volume of water, approximately 23 pounds of gasoline and 1.8 pounds of benzene were removed from the perched aquifer in 2022. 2022 was the tenth year the P&T system was operated.

Approximately 306 pounds of gasoline (just over 50 gallons) and 19.4 pounds of benzene (roughly 2.3 gallons) have been removed over the ten years of P&T operation. The graph at the bottom of Figure 5 summarizes hydrocarbon removal over ten years. Note that the slope of the curve, or rate of removal has remained fairly constant after the higher rate of the first year. Also note that the ratio of benzene to GRO has declined and the recovery lines crossed after the fourth year of operation.

Samples were collected from the aerated water in the P&T holding tank (HTxx samples) in both 2021 and 2022. The results of these sample can be used to evaluate the effectiveness and of holding tank aeration, help estimate necessary aeration duration, and assess the condition of the GAC when used in conjunction with results from samples of treated water discharged to Well MW4 (TWDxx samples). The results of the three samples from 2021 and two from 2022 suggest that aeration at the same time groundwater is being pumped into the holding tank can reduce the hydrocarbon concentration by over an order of magnitude. Aeration continuing for ten days to two weeks after the groundwater pumping has stopped can reduce hydrocarbon concentrations to below groundwater cleanup levels. Samples HT12 and TWD12, collected on the same day in 2021 suggested that the three-season old GAC was losing efficiency. Samples HT13 and TWD13 collected November 3, 2021, confirmed that the GAC was overloaded with hydrocarbons and was overdue for disposal. The benzene concentration exceed the goal of being less that the latest groundwater results from nearby Wells MW71S or MW72S. Samples HT22 and TWD22 from October 2022 show that relatively new GAC can reduce hydrocarbon concentrations to the limits of detection from concentrations similar to those measured in HT13.

8.0 QUALITY ASSURANCE SUMMARY

The project laboratories follow on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC and EPA data quality objectives (DQO). Internal laboratory quality controls for this project include surrogates, method blanks, laboratory control sample/laboratory control sample duplicates (LSC/LSCD), and internal duplicates. If a DQO for one of the controls is not met, the laboratory provides a brief explanation in the case narrative of their report. There are thirteen SGS work orders associated with the 2021 through 2022 P&T effort. SGS work order 1217377 contains the GAC21 sample results, and Air Toxics work order 2111302 contains the VEZ41 sample results. While Shannon & Wilson reviewed the data deliverables, preparing ADEC Laboratory Data Review Checklists for the vapor samples and P&T system process samples was not required for the project.

Based on our review of the 15 laboratory reports, only the GRO result for Sample GAC21 had data quality parameters outside of acceptance criteria. The GRO result was flagged as an estimate due to poor surrogate recovery from the carbon matrix and a method blank detection within a factor of ten of the estimated concentration.

9.0 INVESTIGATION DERIVED WASTE

Investigation derived waste for this project included decontamination water, miscellaneous sampling and maintenance waste, and P&T system operation materials. The miscellaneous sampling and maintenance waste included nitrile gloves, a polyethylene bailer, polypropylene twine, used paper toweling, and 9-volt batteries. The miscellaneous waste was discarded as non-hazardous solid waste except for the batteries. The batteries were placed in a battery recycling bin in Anchorage.

Water collected by the P&T system was aerated in the holding tank and treated through a particulate filter and GAC before discharge down Well MW4. Water used to rinse 50um filters between uses was returned to the holding tank. Based on the HT sample results, the P&T particulate filters were disposed as non-hazardous solid waste. The expired GAC was delivered to US Ecology in Anchorage, Alaska, for disposal as non-hazardous waste on August 4, 2022.

10.0 SUMMARY AND CONCLUSIONS

The groundwater remediation work conducted between July 2021 and December 2023 at the Sterling ZipMart site included remediation system operation, monitoring, and maintenance. The results of these activities are summarized below.

10.1 Restoration of Electrical Service

Electrical service and internet connection was lost to the northern portion of the remediations systems in April of 2023 due to the collapse of the former ZipMart convenience store building. A new overhead line was hung, and a meter pole was installed in the KPB right-of-way on McCall Street. A new underground electrical line between the meter pole and the circuit breaker box on the SVE Blower 2 shed was installed. The installation of a LTE router and an antenna facilitated a cellular connection for remote monitoring. The north system was restarted on October 13, 2023.

10.2 Remediation Systems Operation and Monitoring

SVE System

Table 1 summarizes monitoring, operation, and maintenance of the SVE system. The SVE system on the ZipMart property (Blower 2) had two significant power outages and a period of short-circuiting due to a broken wellhead. Using the results of analytical vapor Samples VEZ40, and VEZ41 during periods of steady operation, an estimate of hydrocarbon recovery from the subsurface as vapor was calculated (See Table 2). Over approximately 660 days, at least 136 pounds (roughly 23.1 gallons) of gasoline-range hydrocarbons and 16.7 pounds of benzene recovery are estimated.

AS Systems

Table 3 summarizes monitoring and operation of the AS systems, with one page for each system. The N.AIS experienced three power outages, two compressor failures, two timer failures, and leaks at two AS wells during the July 2021 to December 2023 reporting period. The N.AIS operated for over 14,500 hours over the 20,100-hour period of June 24, 2021, to October 13, 2023. N.AIS sparging wells ASW7 and ASW8 were closed during the periods when the P&T holding tank was being aerated.

The S.AIS system did not experience extended power outages, but had one compressor failure, two timer failures, two fouled air diffusers, and a DC power adaptor failure over the reporting period. Based on hour meter readings, the S.AIS ran 54 percent of the time while the timer was set to 4 hours and 4 hours off, and 63 percent of the time while set to run 4 hours on and 2 hours off.

The E.AIS system ran nearly continuously over the reporting period. There were a handful of power outages of less than 2 hours each and one 6-hour outage in August of 2023. Two

compressors failed at the E.AIS, each shortly before a site visit. Additional maintenance at the E.AIS included cleaning flow meters, replacing outlet filter canisters, changing filters, replacing three wellhead covers, removing three fallen trees, replacing compressor cooling fans, and working to maintain flow through Well ASW10.

Pump & Treat System

The seasonal P&T system was operated between April 4, 2021, and November 6, 2021, and again between July 28, 2022 and October 21, 2022. Approximately 41,940 gallons of groundwater were treated through the system in 2021, resulting in the estimated removal of 21 pounds of total hydrocarbons (as GRO) and 1.5 pounds of benzene. Approximately 33,429 gallons of groundwater were treated in 2022, resulting in the removal of roughly 23 pounds of GRO and 1.8 pounds of benzene. Table 4 summarizes the operation and laboratory results for the 2021 P&T operation, and Table 5 summarizes the 2022 P&T results and operation.

10.3 Conclusions

The SVE system and seasonal P&T system continued to remove contaminant mass from the subsurface over the reporting period. The AS systems continued to inject atmospheric air into the groundwater with the intent of enhancing aerobic biodegradation of contaminants. Groundwater sampling was not performed to investigate the efficacy of the AS system. Recommendations were made in Shannon & Wilson's *Fiscal Year 2021 Monitoring and Remediation* report submitted to the ADEC in November of 2021. The results and observations from the July 2021 to December 2023 reporting period do not suggest significant changes to those recommendations.

11.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives in the study of this site. The findings we have presented within this report are based on the limited research, sampling, and analyses that we conducted. They should not be construed as definite conclusions regarding the site's groundwater quality. As a result, the sampling, analyses, and data interpretations can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantee that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations,

or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Shannon & Wilson has prepared the attachment in Appendix E "Important Information About Your Geotechnical/Environmental Report" to assist you and others in understanding the use and limitations of our report. We appreciate this opportunity to be of service and your confidence in our firm. If you have questions or comments regarding this submittal, please contact Dan McMahon or the undersigned at (907) 561-2120.

SHANNON & WILSON, INC.

Randy Hessong Digitally signed by Randy Hessong
Date: 2024.01.25 17:28:05 -09'00'

Randy Hessong
Engineering Staff

TABLE 1
SUMMARY OF VAPOR FIELD MEASUREMENTS

Recovery Well/Line	Date	Air Flow (cfm)	FID (ppm)	PID (ppm)	LEL (%)	Oxygen (%)	CO_2 (%)	Temper-ature (°F)	Comments
Blower 2	5/6/21	106	12	3.0	-	-	-	76	28.5" vacuum. Sample **VEZ40** (1L SUMMA), 12:00
	6/3/21	105	13	3.5	0%	20.0%	-	82	29.25" vacuum, knockout drum dry
	7/9/21	105	5.0	4.7	0%	19.8%	0.9	-	29" vacuum. ZJT w/ GA-90
	9/9/21	105	9.0	6.6	0%	19.7%	-	84	28" vacuum, knockout drum dry
	10/7/21	105	-	-	-	-	-	-	28" vacuum, RW1 = 65 CFM, RW2 gauge at 54 CFM seems high, heat trace on. Short power outage 9/29/21
	11/6/21	105	8.5	-	0%	19.9%	-	72	28.5" vacuum, Sample **VEZ41** (1L SUMMA), 20:15
	12/30/21	111	-	-	-	-	-	-	24.5" vacuum, 6 gallons water drained from knockout drum. 5.5 hour power outage 12/28-29/21
	2/7/22	105	9.0	-	0%	21.1%	-	73	31" vacuum
	7/19/22	105	7.0	4.4	-	-	-	-	31.5" vacuum
	7/28/22	103	-	-	-	-	-	-	32" vacuum. RW1 monument settled - well cap broken, vacuum leaking. Solid cap added to allow SVE operation
	8/15/22	86	10	5.7	2%	19.9%	-	-	42" vacuum with VE1, RW1 and RW2 flowing after repair of RW1 and RW2
	8/15/22	102	20	12	2%	19.8%	-	-	30" vacuum running only RW1 and RW2
	9/16/22	95	-	-	-	-	-	-	27.5" vacuum, no water in KO
	10/19/22	92	-	-	-	-	-	-	40" vacuum. RW2 not flowing. Adjust
	10/19/22	101	7.0	4.3	0%	20.1%	-	77	33-34" vacuum. Heat trace turned on, AIS on odd bank
	10/19/22	103	-	-	-	-	-	-	31" vacuum. AIS on even bank, 19:30
	10/21/22	104	-	-	-	-	-	-	31" vacuum, RW2 at 26 CFM
	12/16/22	108	-	-	-	-	-	-	28" vacuum. After restart from power outage since 10/30/22 (main breaker tampered with)
	1/28/23	107	-	-	-	-	-	-	29.5" vacuum. KO drum dry
	5/22/23	-	-	-	-	-	-	-	ZipMart building collapsed under snow load in April. Power disconnected 4/25/23
	10/13/23	103	20	-	0%	20.9%	-	58	28.5" vacuum. Electrical power restored. Drain trace of water from knockouts. Reset packer pressures. N.AIS not running
	10/13/23	-	45	-	-	-	-	-	Recheck after running for 26 minutes. N.AIS not running
	10/13/23	98	175	-	0-6%	19.4%	-	77	N.AIS even bank of wells running 2.5 hours after restart

Key on Page 3 of Table 1

TABLE 1
SUMMARY OF VAPOR FIELD MEASUREMENTS

Recovery Well/Line	Date	Air Flow (cfm)	FID (ppm)	PID (ppm)	LEL (%)	Oxygen (%)	CO_2 (%)	Temper-ature (°F)	Comments
VEW1	7/28/22	35	-	-	-	-	-	-	Well reactivated because of problems with RW1
	8/15/22	26	3	2	0%	20.0%	-	-	Operating with RW1 and RW2. Well closed after measurements
	9/16/22	Closed	-	-	-	-	-	-	
	10/19/22	26	-	-	-	-	-	48	Reopened because RW2 is not flowing. AIS on odd bank
	10/19/22	24	-	-	-	-	-	-	AIS on even bank
	12/16/22	25	-	-	-	-	-	-	No flow/frozen at restart, opens up with time
	1/28/23	<25	-	-	-	-	-	-	Flow is present below gauge limit
	10/13/23	>0	12	-	failed	20.5%	-	45	Electricity restored. No flow registering, has vacuum and some flow
	10/13/23	~20	20	-	failed	20.6%	-	45	N.AIS even bank running
RW1	5/6/21	65	23	6.5	-	-	-	-	Sample **VEZ40**, just before switch from odd to even N.AIS
	6/3/21	60	19	9.4	0%	19.8%	-	48	
	7/9/21	68	17	5.4	0%	20.2%	0.0	-	ZJT w/GA-90
	9/9/21	65	17	7.4	0%	19.3%	-	51	
	11/6/21	62	12	-	0%	19.4%	-	41	Sample **VEZ41**
	12/30/21	60	-	-	-	-	-	-	
	2/7/22	62	11	-	0%	19.9%	-	-	
	7/19/22	70	1	0.5	-	-	-	-	Wellhead likely broken
	7/28/22	90+	-	-	-	-	-	-	Well head cover has settled and broken well cap. Vacuum is short circuiting. 18 psi in packer. Solid cap added to allow SVE operation
	8/15/22	55	22	9.1	2%	19.7%	-	-	With VE1, RW1 and RW2 flowing after repair
	8/15/22	78	-	-	-	-	-	-	VE1 closed, vapor recovery maximized. Gauge likely partially fouled
	9/16/22	84-89	-	-	-	-	-	-	
	10/19/22	75	-	-	-	-	-	48	Was flowing 90-95 CFM before adjustments. Sampling pump failed
	10/19/22	61	-	-	-	-	-	-	AIS switched to even bank
	12/16/22	60	-	-	-	-	-	-	Started at 75 CFM and dropped as VE1 and RW2 opened up.
	1/28/23	53	-	-	-	-	-	-	Gauge likely cleared out
	10/13/23	52	100	-	0%	20.9%	-	46	Electricity restored. Well packer has no air pressure, filled to 33 psi
	10/13/23	69	195	-	failed	19.0%	-	46	N.AIS even bank running

Key on Page 3 of Table 1

TABLE 1
SUMMARY OF VAPOR FIELD MEASUREMENTS

Recovery Well/Line	Date	Air Flow (cfm)	FID (ppm)	PID (ppm)	LEL (%)	Oxygen (%)	CO_2 (%)	Temper-ature (°F)	Comments
RW2	5/6/21	41	3.2	1.4	-	-	-	-	Sample **VEZ40**, just before switch from odd to even N.AIS
	6/3/21	49	7.5	2.0	0%	20.1%	-	47	
	7/9/21	45	1.0	0.2	0%	20.9%	0.0	-	ZJT w/GA-90
	9/9/21	43	3.1	1.9	0%	20.0%	-	49	
	11/6/21	39	2.5	-	0%	20.3%	-	42	**Sample VEZ41**
	12/30/21	45	-	-	-	-	-	-	
	2/7/22	25	2.8	-	0%	20.4%	-	-	
	7/19/22	30	0	0	-	-	-	-	Likely no flow - short circuit to broken well RW1
	7/28/22	0-20	-	-	-	-	-	-	0 psi in packer, sparge air is flowing up inside of well. Packer pulled and well screen scrubbed with brush. Airline fitting (sparge) cracked. Replace with fitting from RW1.
	7/28/22	40	-	-	-	-	-	-	After well repair
	8/15/22	32	8.5	5.8	0%	19.8%	-	-	With VE1, RW1 and RW2 flowing after repair
	8/15/22	31	-	-	-	-	-	-	VE1 closed, vapor recovery maximized
	9/16/22	25	-	-	-	-	-	-	
	10/19/22	0	-	-	-	-	-	46	No flow as found. Opened VE1
	10/19/22	30	-	-	-	-	-	-	AIS switched to even bank. RW2 likely has a partial short circuit
	12/16/22	30	-	-	-	-	-	-	After restart from power outage
	1/28/23	31	-	-	-	-	-	-	Well head uncovered. Packer pressure = 24.5 psi. Adjusted to 27 psi.
	10/13/23	~25	2	-	0	20.9%	-	45	Flow meter may be stuck, possibly no flow. Packer inflated from 14 to 36 psi
	10/13/23	0-25	30	-	failed	20.3%	-	45	N.AIS even bank running

KEY	DESCRIPTION
CFM	Cubic feet per minute
FID	Flame ionization detector
PID	Photoionization detector
LEL	Lower explosive limit (calibrated to methane)
CO_2	Carbon dioxide
<,>,~,+	Less than, greater than, approximately, at least
°F	Degrees Fahrenheit
ppm	Parts per million
psi	Pounds per square inch
%	Percent
"	Inches of water
-	Not measured or not applicable

TABLE 2
SUMMARY OF SVE ANALYTICAL RESULTS

Parameter Tested	Method*	Sample ID Number^ and Collection Date			
		Soil Vapor Samples - Blower 2 (North)			
		VEZ40^^ 5/6/21	VEZ41 11/6/21		
Outlet FID Reading - ppmv	Sensidyne FID	12	9		
Lower Explosive Limit - percent	Q-Rae multigas	0	0		
Temperature - Fahrenheit	Dial thermometer	76	72		
Measured Flow Rate - cfm	Gauge	106	105		
Aromatic Volatile Organics (BTEX)					
Benzene - ppmv	TO-3 M	0.95	0.8		
Toluene - ppmv	TO-3 M	1.1	0.67		
Ethylbenzene - ppmv	TO-3 M	0.049	0.019		
Xylenes - ppmv	TO-3 M	0.71	0.30		
TPH (gasoline range) - ppmv	TO-3 M	7.2	5.5		
VPH - lbs/hour	Ideal Gas Law**	0.01	0.01		
VPH - gallons/day	5.88 lbs/gallon	0.04	0.03		
Benzene - lbs/day**	Ideal Gas Law**	0.03	0.02		

OVERALL VAPOR RECOVERY RATES - Blower 2 (North)

Start date	Stop date	number of days	avg. benzene rate, lbs./day	total benzene, lbs.	avg. GRO rate. gal./day	total GRO, gallons
5/6/2021	11/6/2021	184	0.027	4.93	0.039	7.14
11/6/2021	10/30/2022	358	0.025	8.82	0.034	12.01
12/16/2022	4/13/2023	118	0.025	2.91	0.034	3.96
	Totals:	**660**		**16.7**		**23.1**
					pounds:	135.9

KEY	DESCRIPTION
*	See laboratory report for reporting limits and method details
^	Sample ID No. preceded by "100972-" on the chain of custody form
^^	Sample 100972-VEZ40 laboratory report is in the FY2021 monitoring report
**	Using a gas constant of R=0.7302 atm-ft^3/lbmol R
ppmv, lbs, cfm	Parts per million by volume, pounds, cubic feet per minute
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons
%	Percent
avg.	Average

TABLE 3
AIR SPARGE SYSTEM MONITORING LOG

Date	North AS Wells																				Hour Meter	Comments
	ASW1		ASW3		ASW5		ASW7		RW1		ASW2		ASW4		ASW6		RW2		ASW8			
	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*		
6/24/21	2.1	*5.6*	1.7	*4.0*	2.9	*7.6*	1.6	*5.9*	2.5	*5.8*	2.5	*4.9*	2.6	*7.8*	2.5	*8.0*	2.4	*4.9*	1.4	*5.4*	87826	12:20. Readings before connecting airlines from bubbler back to ASW7 and ASW8
9/9/21	1.9+	*3.8*	1.4+	*6.9*	2.2-	*7.1*	1.4	*5.1*	1.9	*4.1*	2.9	*4.5*	2.5-	*7.7*	1.8	*7.5*	1.7+	*4.6*	1.1	*5.5*	89661	19:05, 9.9 psi (even), 11.7 psi (odd). ASW 7 & 8 on P&T bubbler.
9/9/21	1.9	*4.2*	2.5	*7.2*	2.5	*7.1*	1.2+	*7.9*	2.0	*4.1*	1.9+	*4.5*	2.4-	*7.5*	2.5-	*7.5*	1.9+	*4.6*	1.9	*6.4*	-	20:05, after connecting air lines to ASW7 & ASW8 and adjusting
9/14/21	1.9	*3.5*	2.5-	*7.0*	2.3	*7.2*	1.4	*7.8*	2.0	*4.1*	1.9	*4.5*	2.4	*7.6*	2.3	*7.4*	2.0	*4.5*	1.8+	*6.4*	89799	20:32, 9.5 psi (even), 10.0 psi (odd)
9/22/21	1.9	*3.5*	2.3	*7.0*	2.1+	*7.2*	1.2	*7.8*	2.3-	*3.8*	1.9+	*4.5*	2.3	*7.6*	1.9-	*7.6*	2.3	*4.4*	2.0	*6.5*	89990	16:22, 9.6 psi (even), 10.0 psi (odd) before connecting pond bubbler
9/22/21	1.9	*3.8*	2.4-	*6.9*	2.4-	*7.0*	1.4	*2.8*	2.1	*3.8*	2.0	*4.4*	2.5	*7.5*	2.4	*7.5*	2.2	*4.3*	1.4	*2.9*	-	16:43, 9.5 psi (even), 10.0 psi (odd) after connecting pond bubbler
10/7/21	1.7	-	0.0	-	0.0	-	1.2	-	2.0	-	1.9	-	0.0	-	0.0	-	2.0	-	1.2	-	-	7.6 psi. Short power outage 9/29/21. Compressor very weak after power restored
10/7/21	3.0	*4.1*	4.4	*7.2*	4.3	*7.2*	1.6+	*2.5*	3.0	*3.8*	3.4	*4.8*	4.1	*7.5*	4.1	*7.8*	3.0	*4.3*	1.6+	*2.5*	90353	20:59, 11.5 psi (even), 12.0 psi (odd) after installing Spare compressor with clean outlet filter (pond bubbler is attached)
11/3/21	3.0	*3.6*	3.9	*6.9*	4.5	*7.1*	1.7	*3.8*	3.1b	*4.4*	3.3	*4.4*	3.4	*7.5*	4.5	*7.7*	3.9	*4.6*	1.3	*3.6*	90996	RW1 was not flowing. Cleared particles from valve. 11.2 psi (even), 11.8 psi (odd), pond bubbler running
11/3/21	3.0-	*3.8*	3.3+	*7.0*	3.2	*7.2*	3.2	*8.1*	3.0-	*4.2*	3.1	*4.5*	3.3+	*7.6*	3.4-	*7.5*	2.9	*4.6*	3.2	*6.5*	91000	19:35, 11 psi (even), 11.5 psi (odd) after reconnecting ASW7 & 8 and adjusting
11/18/21	3.3	*4.4*	3.6	*7.5*	3.5	*7.6*	3.0	*4.3*	3.0	*6.4*	3.4	*4.5*	4.2	*7.5*	3.9+	*7.6*	3.7	*4.3*	1.0+	*6.3*	-	11.1 psi (even), 11.5 psi (odd). Data logger down since 10/26/21. Repaired with help of Campbell Scientific
12/30/21	3.2	*4.0*	3.3	*6.9*	3.4	*7.0*	3.2	*7.8*	3.3	*3.7*	3.3-	*4.3*	3.4+	*7.4*	3.4+	*7.5*	3.0	*4.3*	3.3	*6.4*	92326	Timer stuck in off mode due to 5.5 hr. power outage 12/28-12/29. Rewired timer to normally closed. (power is from SVE 120V breaker) 11.0 psi (even), 11.5 psi (odd). Reading after adjustments to even numbered wells
2/7/22	3.2+	*4.6*	3.3-	*7.0*	3.0	*6.8*	3.3-	*8.4*	3.4+	*4.2*	3.3+	*4.3*	3.4+	*7.4*	3.4-	*7.4*	3.5	*3.7*	3.3	*6.5*	93254	11.0 psi (even). Snow clearing
7/19/22	3.0+	*3.7*	2.6+	*6.8*	3.0+	*7.2*	3.2+	*8.0*	3.3	*4.2*	3.2+	*4.6*	3.2+	*7.6*	3.0+	*7.8*	3.3+	*4.2*	3.0+	*6.8*	97137	10.5 psi (even), 11.5 psi (odd)
7/28/22	2.2	*4.0*	2.8	*7.4*	3.0	*7.4*	2.6+	*8.1*	2.4	*4.3*	-	-	-	-	-	-	-	-	-	-	-	Vanes failed on active Spare compressor on 7/22. Compressor E2 from S.AIS (20.5psi @ 10 CFM) moved to N.AIS and greased. Switching timer failed. Odd bank only after restart. RW1 capped to allow SVE but not AS operation
7/28/22	-	-	-	-	-	-	-	-	closed		2.5	*4.5*	2.7	*7.7*	2.7	*7.6*	2.5	*4.7*	2.7	*6.7*	-	10.5 psi (even) Main timer swapped with switching timer, programed and restarted after RW2 repairs
8/15/22	3.3+	*4.1*	3.2+	*7.0*	3.6	*3.3*	1.6	*3.4*	2.0	*4.7*	3.1+	*4.8*	3.6	*7.6*	3.4	*7.7*	2.1	*5.0*	1.5	*3.3*	97787	11.0 psi (both). After well packers in RW1 and RW2 replaced, RW1 cut down 0.17', air line repaired, ASW7 & 8 on bubbler
9/16/22	-	-	-	-	-	-	-	-	-	-	2.9	*4.8*	3.7	*8.0*	3.6	*7.9*	2.0-	*5.0*	1.2+	*4.7*	98550	Timer has failed. Running on even bank only. RW1 packer has leaked down, pump to 36 psi.
9/16/22	2.4	*3.8*	3.0+	*7.5*	3.0+	*7.5*	2.4	*8.2*	2.4	*3.5*	2.4-	*4.6*	3.0	*7.9*	3.0-	*8.0*	2.4-	*5.2*	2.4	*6.9*	-	Timer replaced (3 hour odd, 3 hour even). ASW7 and ASW8 lines connected to wells
9/22/22	2.4	*4.4*	2.9	*4.0?*	3.4	*7.4*	2.2	*8.4*	2.4+	*3.9*	2.2	*4.9*	3.1+	*8.0*	3.2-	*7.9*	2.8-	*5.0*	2.4	*6.9*	-	11.5 psi (even), 12.0 psi (odd)
9/27/22	2.2+	*4.0*	2.9	*7.4*	3.2+	*7.6*	2.9	*8.3*	2.2+	*4.6*	2.7	*5.0*	2.8	*7.9*	2.7	*8.2*	2.5	*5.2*	2.4	*6.9*	-	12.0 psi (even), 11.5 psi (odd). Packer pressures topped off. ASW7 & 8 lines to bubbler
10/19/22	2.2+	*4.0*	2.5+	*7.5*	2.5	*7.5*	3.7-	*6.6*	2.2	*4.6*	2.6	*4.9*	2.6	*8.1*	2.8	*8.1*	2.5	*5.2*	2.3	*5.1*	99346	12.5 psi (even, 11.4 psi (odd). Too much flow to bubbler. Adjusted.
10/19/22	2.4	*4.1*	3.4	*7.7*	3.4	*7.8*	1.4	*4.4*	2.5	*4.8*	2.6	*4.9*	3.4+	*8.2*	3.4+	*8.2*	2.5	*5.1*	1.4	*4.4*	-	11.6psi (even and odd). Bubbler working
10/21/22	2.2	*4.1*	3.0+	*7.7*	3.2	*7.7*	2.0+	*8.3*	2.5	*4.5*	2.5	*4.9*	2.9-	*8.1*	2.9	*8.1*	2.5b	*5.0*	2.5	*6.9*	99395	11.5 psi (even and odd). Reading after attaching lines to ASW7 and ASW8 (bubbler off). RW1 packer pulled, air leak repaired.
12/16/22	2.3	*3.9*	3.1	*7.5*	3.4-	*7.5*	2.1+	*8.1*	2.9	*4.1*	2.6+	*4.7*	2.4	*7.9*	3.0	*8.1*	2.5	*4.8*	2.6+	*6.8*	99612	11.5 psi (even), 11.3 psi (odd). Power out since 10/30/22 (main breaker tampered with). Timer reprogrammed, data logger battery recovered
1/28/23	2.2+	*3.6*	2.8-	*7.4*	3.0	*7.4*	1.8	*8.0*	3.6	*3.6*	2.5-	*4.7*	2.1	*7.9*	2.9	*7.8*	3.6	*4.8*	2.3+	*6.7*	100640	11.0 psi (even). Snow clearing. Main timer has failed - wired normally closed for manual operation. Datalogger not communicating with DSL modem. Disassemble and reassemble logger body
1/28/23	2.4	*3.8*	3.0	*7.5*	3.2	*7.5*	2.2	*8.1*	2.5	*3.5*	2.4	*4.6*	2.9	*7.9*	2.9	*7.8*	2.5	*4.7*	2.6	*6.8*	-	After adjustments. Switching timer working properly. Padlock hasp broke, gate closed with cable ties
4/13/23	2.5	*4.5*	2.6	*7.1*	2.4	*7.0*	3.0	*8.5*	2.4	*3.5*	2.5	*4.6*	2.5	*7.6*	2.4	*7.7*	3.8	*4.9*	2.5	*6.5*	102435	10.5 psi (even), 11.5 psi (odd)
5/22/23	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	102582	Electrical power disconnected before 4/25/23 due to building colapse. System off
6/27/23	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	-	Remove data logger battery and charge. Put chain and padlock on gate. Look at potential meter base locations. Southeast property corner flagged. Try to locate soutwest property corner marker. Not found. Estimated location staked. ASW7 underground line marked (white). Old gas line marked (yellow)
9/28/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Underground powerline installed from breaker box on Blower 2 shed to planned location of new meter pole. CSI Cell 205 LTE router and LTE antenna installed. CR1000 data logger has lost some programming. Need laptop to update and reinstall program.
10/5/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Install recharged battery. Data logger software updated, program restored. Work with Campbell Scientific to get data logger communicating through LTE cellular service. Data recovered from S.AIS and E.AIS loggers
10/13/23	2.0	*4.2*	3.0-	*7.8*	3.0+	*7.7*	1.8+	*8.4*	2.6	*4.8*	2.2	*5.0*	2.7	*8.0*	2.7	*8.0*	2.5	*5.1*	2.5+	*7.0*	102585	Electrical power restored. Inspect equipment, Free stuck Odd switching solenoid, reset timers, grease compressor, install clean outlet filter. Inspect rotate, and reinstall motor cooling fan. Start N.AIS. Initial rough running smooths out, pressure increases. ASW4, 6, and 8 slow to start flowing. Sort out some loose wires on datalogger to get good readings

Key on Page 3 of Table 3.

Date range	*Days*	*Calendar hours*	*Meter hours*
6/24/21-4/13/23	*658*	*15792*	*14609*

TABLE 3
AIR SPARGE SYSTEM MONITORING LOG

Date	South AS Wells												Hour Meter	Comments
	RW16		RW7		RW9		RW15		RW3		RW12			
	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*		
6/24/21	closed		closed		2.6	*6.1*	3.0	*6.2*	2.6	*7.5*	2.8	*5.7*	57930	
9/9/21	closed		closed		3.2+	*5.4*	3.3	*6.0*	3.0	*7.1*	3.5	*5.6*	59236	8.9 psi. 21:00. Timer not working, no obvious failure point, battery at 9.46 volts. Continuous operation since 8/9/21
9/14/21	closed		closed		3.2	*5.4*	3.3	*6.0*	3.0	*6.9*	3.4	*5.5*	59351	8.7 psi. 17:20. Take Intermatic timer from SVE Blower 1, adapt to S.AIS. Battery has corroded connections - may not hold up.
9/19/21	closed		closed		-	-	-	-	-	-	-	-	-	Intermatic timer failed in off position late 9/14/21. Original timer re-installed and reprogrammed to 4 hr. on, 4 hr. off
11/3/21	closed		closed		3.3	*5.4*	3.3	*6.2*	2.9	*7.1*	3.5	*5.50*	59890	8.8 psi. 16:58. 4 hours on, 4 hours off
12/30/21	closed		closed		3.5-	*5.2*	3.6-	*6.2*	3.0	*7.5*	3.6	*5.80*	60571	RW15 had no flow. RW15 packer pulled, new air diffuser installed, reset. 8.9 psi. 19:35
2/7/22	closed		closed		3.3+	*5.3*	3.6+	*5.9*	3.0-	*7.2*	3.4	*5.60*	61035	8.6 psi. Snow clearing
7/19/22	closed		closed		3.5+	*5.5*	3.6+	*6.2*	3.2+	*7.5*	3.5-	*6.10*	62977	9.0 psi.
7/28/22	closed		closed		3.0 to 3.5 psi on the four wells								63086	8.9 psi running compressor E2 before moving E2 to N.AIS
7/28/22	closed		closed		2.3	*5.1*	2.4	*5.6*	2.2	*6.7*	2.3+	*4.7*	-	8.2 psi running Compressor E1. Test of E1 = 10.5 psi at 10 CFM
8/15/22	closed		closed		-	-	-	-	-	-	-	-	-	Timer battery dead, failed in on mode. Battery replaced, wire patched, programmed for 4 hours on - 2 hours off.
9/16/22	closed		closed		2.2	*5.4*	2.5	*5.7*	2.3	*7.1*	2.6	*5.2*	64078	8.7 psi. New timer installed (4 hr. on, 2 hr. off), normally closed
9/22/22	closed		closed		2.2	*5.5*	2.4	*5.9*	2.0	*6.9*	2.3	*4.9*	-	8.4 psi.
9/27/22	closed		closed		2.3	*5.6*	1.9	*10.0*	2.2	*7.2*	2.3	*4.7*	-	9.0 psi.
10/19/22	closed		closed		2.4+	*5.6*	1 b	*10.2*	2.2	*7.4*	2.3	*4.7*	64605	10.7 psi. Try to blow out RW15
10/19/22	closed		closed		2.6	*5.7*	1 b	*9.2*	2.6	*7.9*	2.6	*4.8*	-	9.8 psi. After adjustments. Heat trace on 10/21/23
12/16/22	closed		closed		4.2	*6.4*	1.4	*11.9*	3.6	*10.4*	4.2	*5.9*	65532	12.6 psi after restart. Found with motor running, compressor not spinning, failure date unclear due to CR1000 power outage. Spare compressor installed. Fan for motor side rubbing on case, fan adjusted but lock tab is broken. Greased, cleaned filters installed
1/28/23	closed		closed		3.7+	*6.0*	0.0	*12.1*	3.7+	*9.7*	3.8	*5.4*	66216	12.9 psi. Spare compressor motor fan loose again. AC transformer for data logger bad, 8 volts in logger. Charge with seperate battery charger
1/28/23	closed		closed		3.1	*5.5*	0.0	*9.3*	3.4	*7.7*	3.1	*4.8*	-	10.0 psi. Reading after swapping in rebuilt E1 compressor and removing Spare. New motor fan installed on Spare compressor. Data logger battery reinstalled at 13.8 volts - should run a few weeks
4/13/23	closed		closed		2.5	*5.4*	0.0	*11.0*	2.5	*6.6*	2.4	*5.4*	67413	9.6 psi. Data logger battery drained 3/7/23. Replacement AC adaptor installed. Voltage rises to 12.4volts.
5/22/23	closed		closed		-	-	-	-	-	-	-	-	-	System running, Well RW15 remains fouled, tried to pull out well packer without success
6/27/23	closed		closed		2.4	*5.9*	closed		2.4	*6.9*	2.0	*6.1*	68609	12.0 psi.
6/27/23	closed		closed		2.8	*6.0*	closed		2.8	*7.2*	2.2+	*7.0*	-	10.7 psi after adjustments.
6/27/23	closed		closed		2.4	*6.0*	2.4	*7.1*	2.4	*6.9*	1.8+	*5.5*	-	9.1 psi after successfully pulling RW15 well packer and replacing air diffuser
9/28/23	closed		closed		2.8	*6.1*	2.5	*7.3*	2.7	*7.1*	1.3	*5.9*	70098	9.5 psi. Tried higher pressure on RW12. Diffuser likely needs replacment
10/13/23	closed		closed		2.4	*6.2*	2.3	*7.5*	2.5	*7.1*	1.2+	*5.8*	70338	9.5 psi. Well packer air pressures checked and pumped up. RW12 packer pressure near 0 psi.

Key on Page 3 of Table 2.

Date range	*Days*	*Calendar hours*	*Meter hours*	
6/24/21-7/28/22	*399*	9576	5156	53.8 *% of time running*
9/16/22-10/19/22	*33*	792	527	66.6 *% of time running*
12/16/22-10/13/23	*301*	7224	4806	66.5 *% of time running*

TABLE 3
AIR SPARGE SYSTEM MONITORING LOG

Date	East AS Wells																												Comments
	ASW10		ASW11		ASW12		ASW13		ASW14		ASW15		ASW16		ASW17		ASW18		ASW19		ASW20		ASW21		ASW22		ASW23		
	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	CFM	*PSI*	
6/3/21	1.5+	*7.6*	-	-	1.8+	*6.5*	1.5	*5.6*	-	-	-	-	1.4	*5.5*	-	-	-	-	1.6-	*6.4*	-	-	1.7	*5.2*	1.6	*5.6*	-	-	Replace pressure gauge. 7.2 psi, both compressors running. Change compressor #1 inlet filter.
9/9/21	2.2^	-	1.0^	-	fog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	^	-	-	-	1.2	-	Both blowers running, 8.5 psi. Both outlet cannisters leaking, minimal change with tightening. Turn heat trace on. Needs draining and cleaning
9/14/21	1.9	-	1.9	-	1.8	-	1.4	-	-	-	-	-	1.4	-	-	-	-	-	1.3+	-	-	-	not readable			-	1.1	-	8.1-8.2 psi. Compressor #1 seems weak. Heat trace removed water
9/20/21	1.1^	*wet*	cloudy		barely readal		not readable		cloudy		readable		cleaned		readable		readable		readable		cleaned		cleaned		cleaned		cleaned		Cleaned 5 flow meters, wrapped spare glass outlet filter cannisters with Gorilla tape and installed - leaks are gone. Old aluminum canisters are deformed.
9/20/21	0.0	*7.2*	1.8-	*4.6*	1.8	-	1.7	-	1.8	*7.9*	1.8	*6.4*	1.8	*5.1*	1.8-	*5.4*	1.8	*5.6*	1.7	*6.2*	1.7+	*4.5*	1.8-	*4.8*	1.7+	*6.4*	1.8-	*5.4*	7.2 psi, 19:30. After changing outlet filters and adjusting. Total blower output is low.
9/22/21	0.0	*7.2*					1.8-	*5.5*	-	-	-	-	-	-	-	-	-	-	1.8+	*6.2*	-	-	-	-	-	-	1.8-	*5.4*	7.2 psi, 17:05. Glass jars working well
11/3/21	0.0	*7.2*	1.8	*4.6*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	*4.9*	-	-	1.8	*5.4*	7.2 psi, 20:10
11/18/21	0.0	*7.2*	1.4	*4.5*	-	-	-	-	-	-	-	-	1.8	*5.2*	-	-	-	-	-	-	-	-	1.8-	*4.9*	-	-	1.8	*5.4*	7.4 psi, 19:25. Test Compressor 1: 7.5 psi at 10 CFM. Try and test Compressor 2 - vanes break up after restart. Install poorly rebuilt compressor from N.AIS with cleaned inlet and outlet filters. Both motors greased
12/30/21	1.1-	*7.1*	2.0-	*4.2*	2.0+	*6.1*	-	-	2.0	*7.4*	-	-	1.9	*5.1*	2.0	*5.3*	-	-	-	-	1.9	*4.3*	-	-	-	-	2.0-	*5.4*	7.4 psi, 18:45. Replace weak compressor #1 with rebuilt compressor. Test compressor #2: 16.5 psi @ 10 CFM. Readings are after restart.
2/7/22	1.1	*6.8*	1.7	*4.9*	1.9	*7.5*	-	-	1.9	*7.5*	-	-	-	-	2.0	*5.1*	-	-	-	-	2.0	*5.2*	-	-	-	-	2.1	*5.0*	7.5 psi total, 6.5 psi # 1, 6.2 psi # 2 (sounding rough). ASW10 had no flow, south wells closed to start ASW10
7/19/22	2.2	*7.5*	2.0	*4.5*	-	-	-	-	-	-	-	-	1.6	*5.5*	1.8	*5.6*	-	-	-	-	-	-	-	-	1.9	*7.0*	1.8	*5.5*	8.0 psi total
9/16/22	1.0	*8.0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.0 psi, all flow balls rattling. Three riser covers are cracked.
9/22/22	1.4+	*7.9*	1.8+	*4.9*	1.8	*7.0*	1.8	*6.1*	1.9	*7.5*	1.9+	*7.0*	1.7	*5.5*	1.8	*5.9*	2.0	*6.0*	2.0	*6.5*	1.9	*4.9*	1.8	*5.0*	1.9+	*7.0*	2.0	*5.9*	8.2 psi. Water drained from north outlet (9/27 - water drained from RW10 flow meter)
1/28/23	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9+	*5.8*	8.0 psi. Data logger OK. Three small trees fallen around ASW14, but did not hit well heads
4/13/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Snow depth makes replacing broken well covers impractical. System running, balls rattling
5/22/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.0 psi. Purged water from drain valves, most wells have flow balls rattling. Fixed gate latch
6/27/23	0.0	*7.1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9+	*6.0*	8.6 psi. Outer pump fan on compressor #2 failed. Replaced with fan from Spare compressor. Motor fan on compressor #1 failed. Replace with new black fan. Knock plastic dust out of #1 inlet filter. Replace #2 inlet filter with washed filter. Cleanup plastic shivings in shed. Clean outlet filters and grease for both compressors
9/28/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.0 psi. 6 hour power outage 8/30 to 8/31/23. Flow balls rattling at most wellheads
10/5/23	0.0	*7.4*	>0	*5.0*	>0	*7.0*	0^	*5.9*	1.4	*8.5*	1.2	*6.8*	<1	*5.8*	1.0	*6.0*	1.0+	*6.0*	0.0	*6.6*	>0	*5.2*	1.3+	*5.4*	0.0	*7.0*	1.1	*6.2*	7.6 psi. Compressor 1 has failed, motor running. Clear 3 fallen trees. Replace cracked well covers at ASW13, 16, and 17. New outer cooling fan installed and Spare compressor installed in #1 position. Clean filters installed and motor greased.
10/5/23	0.0	*7.9*	1.9+	*5.4*	1.6?	*7.2*	1.6^	*6.2*	1.8+	*8.2*	1.8+	*7.0*	1.7	*5.9*	1.8-	*6.0*	1.9+	*6.1*	1.9	*6.6*	1.9+	*5.1*	1.8	*5.4*	1.9-	*7.0*	1.8+	*6.1*	8.6 psi. Spare compressor only = 8.0 psi. Drained water from ASW13 line, but it reformed.
10/13/23	1.2-	*7.6*	1.8	*7.3*	-	-	1.8	*6.2*	-	-	-	-	-	-	-	-	1.8	*7.0*	-	-	-	-	-	-	-	-	1.7+	*6.1*	8.6 psi. Close southern half of wells to get ASW10 flowing, open and check. Woven bags added to ASW12, 13 and 22 insulation

KEY	DESCRIPTION
CFM	Cubic feet per minute
PSI	Pounds per square inch
-	Not measured/not determined
^	Water present in flowmeter (flow readings inaccurate)
b	Flow surges - gauge 'bounces"
~	Approximate or estimated value
< or >	Estimated flow less than or greater than reported number
1.8	Flow with line connected to pump and treat bubbler

TABLE 4 - 2021 PUMP AND TREAT SYSTEM ANALYTICAL RESULTS

WATER								
Analyte*:		GRO (AK101)	Benzene (SW8021B)	Toluene (SW8021B)	Ethylbenzene (SW8021B)	Xylenes (SW8021B)	Gallons of Water in Holding Tank	Description
Sample ID	Date	mg/L	mg/L	mg/L	mg/L	mg/L		
ADEC Cleanup Level		*2.2*	*0.0046*	*1.10*	*0.015*	*0.019*	-	Standard for groundwater
-	5/4/2021	-	-	-	-	-	est. 750	System startup. 7.88 ft. initial depth to water in holding tank
UV11	5/6/2021	***40.8***	***2.71***	***5.89***	***0.942***	***7.89***	1,473	Groundwater from UST Vent, about 725 gal. pumped
UV12	6/03/21	***79.8***	***5.50***	***14.1***	***1.90***	***16.7***	15,050	Groundwater from UST Vent. Aeration bubbler started
-	6/12/21	-	-	-	-	-	**17,676**	Tank full to float switch
HT11	6/24/21	0.125	***0.00581***	0.0117	0.00157	0.0127	17,527	Water in holding tank, tank full to float switch
TWD11	6/24/21	0.0432 J	0.000230 J	0.000340 J	<0.000500	<0.00150	17,526	Post-treatment water at Well MW4, about 150 gallons drained. Aeration stopped
-	7/09/21	-	-	-	-	-	**2,457**	Start refilling holding tank, restart aeration
-	9/08/21	-	-	-	-	-	**17,675**	Tank full to float switch
HT12	9/09/21	***2.35***	***0.236***	0.614	***0.0327***	***0.373***	17,675	Water in holding tank, tank full to float switch
TWD12	9/09/21	0.341	***0.044***	0.0775	0.00451	0.0520	17,235	Post-treatment water at Well MW4 after draining ~440 gallons
-	9/14/21	-	-	-	-	-	0	Start refilling holding tank. Very little water left after draining.
-	9/22/21	-	-	-	-	-	~2450	Aeration bubbler started
UV13	10/07/21	***63.4***	***4.31***	***11.1***	***1.49***	***13.3***	4,079	Groundwater from UST Vent at holding tank. Bubbler adjusted Short power outage 9/29/21. Grooundwater pump did not restart. Rewired corroded pump head leads
HT13	11/03/21	***4.20***	***0.317***	0.707	***0.0713***	***0.902***	**9,796**	Water in holding tank before starting to drain tank through filter and GAC to MW4. Aeration stopped
TWD13	11/03/21	1.90	***0.129***	0.259	***0.0261***	***0.324***	9,684	Post-treatment water at Well MW4 after draining ~112 gallons
-	11/06/21	-	-	-	-	-	<15	Tank drained for season. GAC sampled for disposal
Average concentration in groundwater (mg/L)		**61**	**4.2**	Total Volume Pumped (gallons):			**41,940**	Estimated from water depths and tank dimensions
				Mass of GRO Removed (pounds):			**21**	Estimated from three Sample UVxx results and volume pumped
				Mass of Benzene Removed (pounds):			**1.5**	Estimated from three Sample UVxx results and volume pumped

KEY	DESCRIPTION
*	See laboratory report for methods, compounds tested, and laboratory reporting limits
<0.0500	Analyte not detected; laboratory limit of detection of 0.0500 mg/L
mg/L	Milligrams per liter
80.0	Concentration exceeds the 18 AAC 75.345 (October 2023) groundwater cleanup level
J	Estimated concentration less than the limit of quantitation and greater than the detection limit
~	Approximate value
-	Not applicable or sample not tested for this analyte

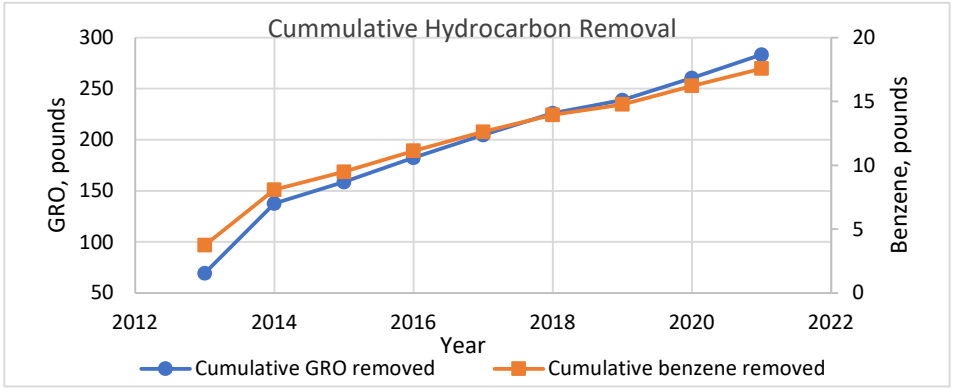
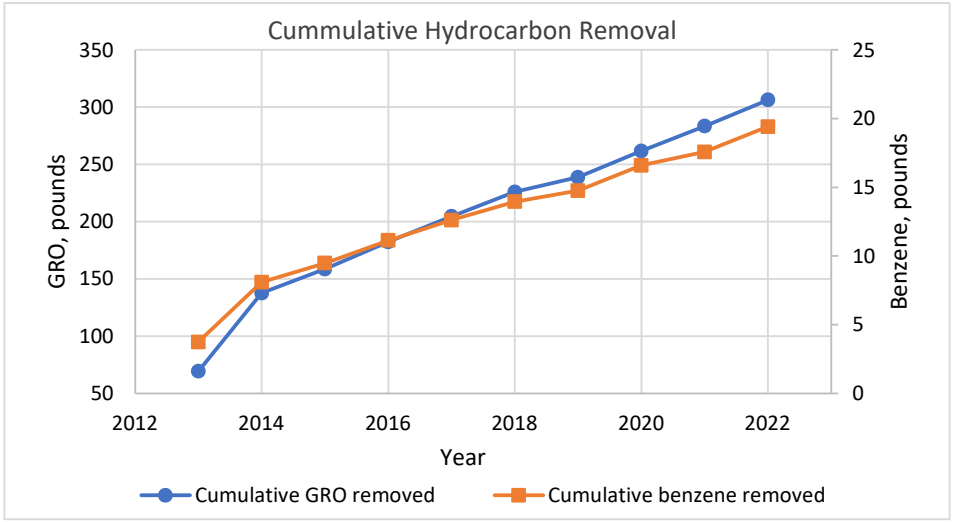
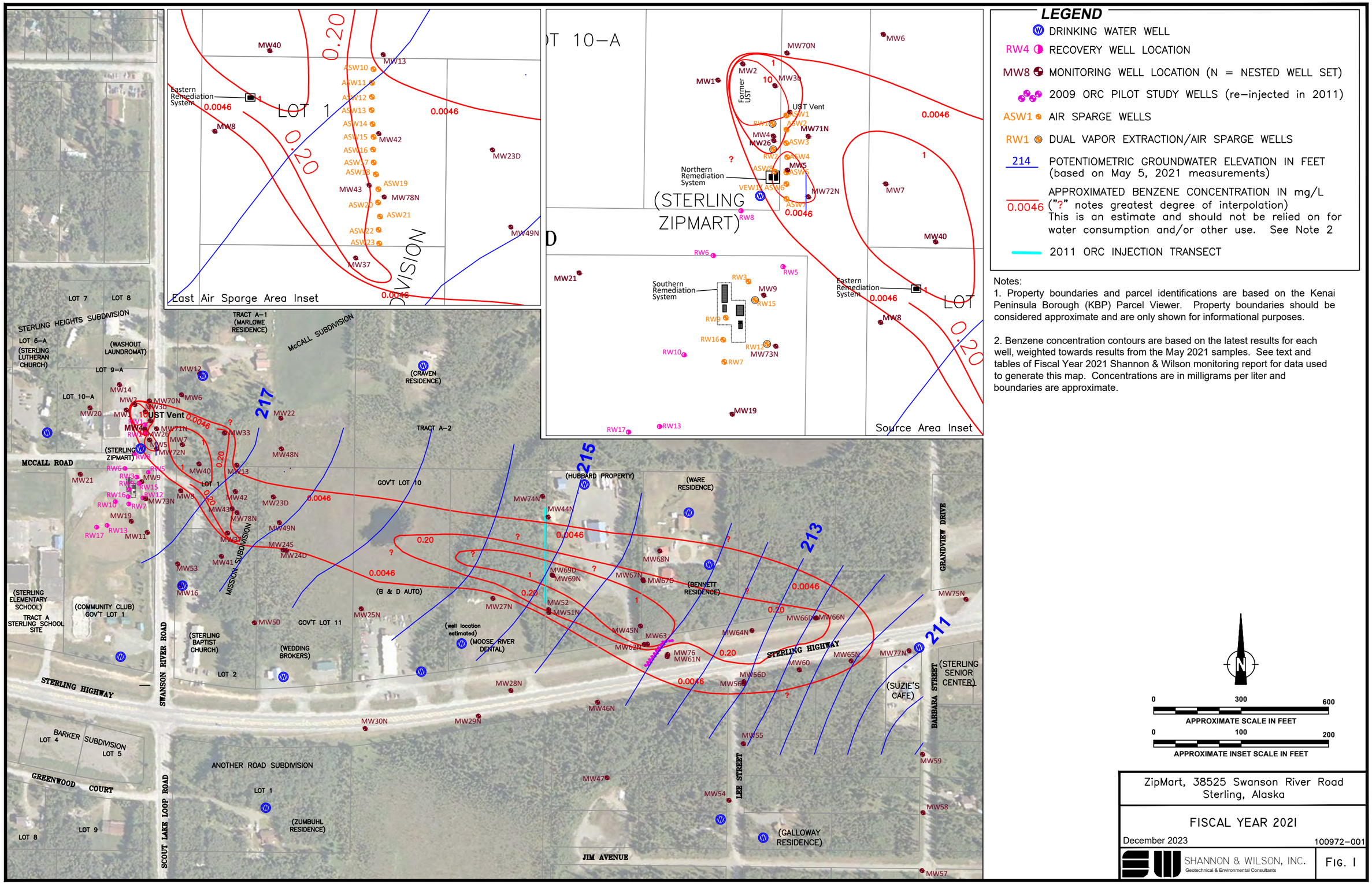


TABLE 5 - 2022 PUMP AND TREAT SYSTEM ANALYTICAL RESULTS

WATER								
Analyte*:		**GRO** (AK101)	**Benzene** (SW8021B)	**Toluene** (SW8021B)	**Ethylbenzene** (SW8021B)	**Xylenes** (SW8021B)	Gallons of Water in Holding Tank	Description
Sample ID	**Date**	mg/L	mg/L	mg/L	mg/L	mg/L		
ADEC Cleanup Level		*2.2*	*0.0046*	*1.10*	*0.015*	*0.019*	-	Standard for groundwater
-	7/28/2022	-	-	-	-	-	0	System startup. Water at 7.40 feet below top of infiltration gallery (UST vent) casing (USTV DTW)
UV21	8/15/2022	***62.2***	***3.72***	***9.79***	***1.69***	***13.6***	8,380	Groundwater pumped from UST Vent. Pond bubbler aeration started. USTV DTW 10.57'
HT21	9/16/22	<0.0500	<0.000250	<0.000500	<0.000500	<0.00150	**18,139**	Tank full to float switch (8/30). Multiple rust hole found in GAC drum. Stopped draining tank. Aeration stopped. USTV DTW 6.72'
TWD21	9/22/22	<0.0500	<0.000250	<0.000500	<0.000500	<0.00150	18,040	Plastic drum for GAC (new GAC). Difficulties sealing lid. 2 gpm discharge
UV22	9/27/22	***97.2***	***9.48***	***19.8***	***1.89***	***13.3***	~10	Tank empty. Start refilling holding tank. Sample 15 min. after startup. USTV DTW 6.95'
UV23	10/04/23	***86.6***	***6.56***	***15.9***	***1.97***	***14.8***	?	Groundwater from UST vent. Aeration started
HT22	10/19/22	***4.38***	***0.664***	0.810	***0.0555***	***0.893***	***15,300***	Water in holding tank before starting to drian tank. Bubbler running hard - reset to low flow. USTV DTW 8.91'
TWD22	10/19/22	<0.0500	<0.000200	<0.000500	<0.000500	<0.00150	14,975	Post-treatment water at Well MW4 after draining ~325 gallons
-	10/21/22	-	-	-	-	-	**~0**	Tank drained, system dimantled for season
Average concentration in groundwater (mg/L)		**82**	**6.6**	Total Volume Pumped (gallons):			**33,429**	Estimated from water depths and tank dimensions
				Mass of GRO Removed (pounds):			**23**	Estimated from three Sample UVxx results and volume pumped
				Mass of Benzene Removed (pounds):			**1.8**	Estimated from three Sample UVxx results and volume pumped

KEY	DESCRIPTION
*	See laboratory report for methods, compounds tested, and laboratory reporting limits
<0.0500	Analyte not detected; laboratory limit of detection of 0.0500 mg/L
mg/L	Milligrams per liter
80.0	Concentration exceeds the 18 AAC 75.345 (October 2023) groundwater cleanup level
J	Estimated concentration less than the limit of quantitation and greater than the detection limit
~	Approximate value
-	Not applicable or sample not tested for this analyte





LEGEND

- DRINKING WATER WELL
- RW4 RECOVERY WELL LOCATION
- MW8 MONITORING WELL LOCATION (N = NESTED WELL SET)
- 2009 ORC PILOT STUDY WELLS (re-injected in 2011)
- ASW1 AIR SPARGE WELLS
- RW1 DUAL VAPOR EXTRACTION/AIR SPARGE WELLS
- 214 POTENTIOMETRIC GROUNDWATER ELEVATION IN FEET (based on May 5, 2021 measurements)
- 0.0046 APPROXIMATED BENZENE CONCENTRATION IN mg/L ("?" notes greatest degree of interpolation) This is an estimate and should not be relied on for water consumption and/or other use. See Note 2
- 2011 ORC INJECTION TRANSECT

Notes:

1. Property boundaries and parcel identifications are based on the Kenai Peninsula Borough (KBP) Parcel Viewer. Property boundaries should be considered approximate and are only shown for informational purposes.

2. Benzene concentration contours are based on the latest results for each well, weighted towards results from the May 2021 samples. See text and tables of Fiscal Year 2021 Shannon & Wilson monitoring report for data used to generate this map. Concentrations are in milligrams per liter and boundaries are approximate.

ZipMart, 38525 Swanson River Road
Sterling, Alaska

FISCAL YEAR 2021

December 2023

100972-001

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

FIG. 1

APPENDIX A

FIELD PHOTOS

Photo 1: The former Sterling ZipMart convenience store building after collapsing under snow load, looking northwest. The electric meters were on the steel cabinet that has pulled away from the wall leaving an unpainted area at the far left. The lighter colored cabinet remaining on the wall is the telephone connection. (May 23, 2023)

Photo 2: Conduit for underground electrical line placed in trench, looking west along the south boundary of the ZipMart lot. The worker is standing at the planned location of a new meter pole. (September 28, 2023)

ZipMart, 32525 Swanson River Road
Sterling, Alaska

PHOTOS 1 AND 2

December 2023 100972-001

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Photo 3: New underground electric line connected to circuit breaker box on the south wall of the Blower 2 SVE shed, looking east. (September 28, 2023)

Photo 4: Data logger cabinet on the inside east wall of the N.AIS shed, with the old DSL modem removed and the new LTE router installed above the RF401 radio communication unit. (September 28, 2023)

ZipMart, 32525 Swanson River Road
Sterling, Alaska

PHOTOS 3 AND 4

December 2023 100972-001

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

APPENDIX B

RESULTS OF ANALYTICAL TESTING BY

SGS NORTH AMERICA INC.

Results of **100972-UV11**

Client Sample ID: **100972-UV11**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1212222014
Lab Project ID: 1212222

Collection Date: 05/06/21 14:48
Received Date: 05/07/21 10:20
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	40.8		5.00	1.55	mg/L	50		05/11/21 22:17
Surrogates								
4-Bromofluorobenzene (surr)	87.4		50-150		%	50		05/11/21 22:17

Batch Information

Analytical Batch: VFC15578
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 05/11/21 22:17
Container ID: 1212222014-A

Prep Batch: VXX37024
Prep Method: SW5030B
Prep Date/Time: 05/11/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	2710		25.0	7.50	ug/L	50		05/11/21 22:17
Ethylbenzene	942		50.0	15.5	ug/L	50		05/11/21 22:17
o-Xylene	2400		50.0	15.5	ug/L	50		05/11/21 22:17
P & M -Xylene	5490		100	31.0	ug/L	50		05/11/21 22:17
Toluene	5890		50.0	15.5	ug/L	50		05/11/21 22:17
Xylenes (total)	7890		150	46.5	ug/L	50		05/11/21 22:17
Surrogates								
1,4-Difluorobenzene (surr)	88.9		77-115		%	50		05/11/21 22:17

Batch Information

Analytical Batch: VFC15578
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 05/11/21 22:17
Container ID: 1212222014-A

Prep Batch: VXX37024
Prep Method: SW5030B
Prep Date/Time: 05/11/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 05/28/2021 10:10:29AM

J flagging is activated

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1213010**

Client Project: **100972-001 Sterling Zip Mart**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1213010**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Randy Hessong**

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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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 05/27/2021 for Mercury by EPA200.8, Nitrate as N by SM 4500NO3-F and VOCs by EPA 524.2) & 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

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.

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

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100972-UV12	1213010001	06/03/2021	06/04/2021	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Detectable Results Summary

Client Sample ID: **100972-UV12**
Lab Sample ID: 1213010001

Volatile Fuels

Parameter	Result	Units
Benzene	5500	ug/L
Ethylbenzene	1900	ug/L
Gasoline Range Organics	79.8	mg/L
o-Xylene	5130	ug/L
P & M -Xylene	11500	ug/L
Toluene	14100	ug/L
Xylenes (total)	16700	ug/L

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Results of **100972-UV12**

Client Sample ID: **100972-UV12**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1213010001
Lab Project ID: 1213010

Collection Date: 06/03/21 17:10
Received Date: 06/04/21 15:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	79.8		10.0	3.10	mg/L	100		06/11/21 00:06
Surrogates								
4-Bromofluorobenzene (surr)	81.1		50-150		%	100		06/11/21 00:06

Batch Information

Analytical Batch: VFC15643
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 06/11/21 00:06
Container ID: 1213010001-A

Prep Batch: VXX37206
Prep Method: SW5030B
Prep Date/Time: 06/10/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5500		50.0	15.0	ug/L	100		06/13/21 18:19
Ethylbenzene	1900		100	31.0	ug/L	100		06/13/21 18:19
o-Xylene	5130		100	31.0	ug/L	100		06/13/21 18:19
P & M -Xylene	11500		200	62.0	ug/L	100		06/13/21 18:19
Toluene	14100		100	31.0	ug/L	100		06/13/21 18:19
Xylenes (total)	16700		300	93.0	ug/L	100		06/13/21 18:19
Surrogates								
1,4-Difluorobenzene (surr)	97.1		77-115		%	100		06/13/21 18:19

Batch Information

Analytical Batch: VFC15652
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 06/13/21 18:19
Container ID: 1213010001-A

Prep Batch: VXX37229
Prep Method: SW5030B
Prep Date/Time: 06/13/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/15/2021 3:43:43PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1820634 [VXX/37206]
Blank Lab ID: 1615624

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1213010001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.2	50-150		%

Batch Information

Analytical Batch: VFC15643
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 6/10/2021 8:14:00AM

Prep Batch: VXX37206
Prep Method: SW5030B
Prep Date/Time: 6/10/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1213010 [VXX37206]
Blank Spike Lab ID: 1615625
Date Analyzed: 06/10/2021 09:08

Spike Duplicate ID: LCSD for HBN 1213010 [VXX37206]
Spike Duplicate Lab ID: 1615626
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1213010001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.921	92	1.00	0.890	89	(60-120)	3.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		87	0.0500		88	(50-150)	0.94	

Batch Information

Analytical Batch: **VFC15643**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37206**
Prep Method: **SW5030B**
Prep Date/Time: **06/10/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1820791 [VXX/37229]
Blank Lab ID: 1616180

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1213010001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	93.8	77-115		%

Batch Information

Analytical Batch: VFC15652
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 6/13/2021 11:51:00AM

Prep Batch: VXX37229
Prep Method: SW5030B
Prep Date/Time: 6/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/15/2021 3:43:53PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1213010 [VXX37229]
Blank Spike Lab ID: 1616181
Date Analyzed: 06/13/2021 12:27

Spike Duplicate ID: LCSD for HBN 1213010 [VXX37229]
Spike Duplicate Lab ID: 1616182
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1213010001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	106	106	100	113	113	(80-120)	5.90	(< 20)
Ethylbenzene	100	93.0	93	100	95.2	95	(75-125)	2.30	(< 20)
o-Xylene	100	95.3	95	100	97.4	97	(80-120)	2.30	(< 20)
P & M -Xylene	200	188	94	200	193	96	(75-130)	2.30	(< 20)
Toluene	100	97.9	98	100	99.0	99	(75-120)	1.10	(< 20)
Xylenes (total)	300	284	95	300	290	97	(79-121)	2.30	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		99	50		100	(77-115)	0.38	

Batch Information

Analytical Batch: **VFC15652**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **IJV**

Prep Batch: **VXX37229**
Prep Method: **SW5030B**
Prep Date/Time: **06/13/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

1213010

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX AK101/SW8021B 3x40mL w/HCl						Total Number of Containers	Remarks/Matrix
100972-UV12	1A-C	17:10	6/3/21		X	X						3	Water, Likely high Concentration

Project Information	
Project Number: 100972-001	
Project Name: Sterling Zip Mart	
Contact: Randy Hessong	
Ongoing Project? Yes ☒ No ☐	
Sampler: Randy Hessong	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attach shipping bill, if any)	

Instructions
Requested Turnaround Time: Standard
Special Instructions: No trip blank per S&W/SGS MSA

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 15:14	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date: 6/4/21	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 15:15
Printed Name: Date:	Printed Name: Date:	Printed Name: Ryan Conlon Date: 6/4/21
Company:	Company:	Company: SGS, Absent

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

11 of 12

F-19-91/UR

#334871 ✓

1.9 DGF

AD No. 35100

SGS

e-Sample Receipt Form

SGS Workorder #: **1213010**

1 2 1 3 0 1 0

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	No	Absent Hand Delivered
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 @ 1.9 °C Therm. ID: D64
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?	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	
	Yes	***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?	No	No Trip Blank per COC
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
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
1213010001-A	HCL to pH < 2	OK			
1213010001-B	HCL to pH < 2	OK			
1213010001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1213713**

Client Project: **100972-001 Sterling Zip Mart**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1213713**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Randy Hessong**

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 (Provisionally Certified as of 05/27/2021 for Mercury by EPA200.8, Nitrate as N by SM 4500NO3-F and VOCs by EPA 524.2) & 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

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
100972-HT11	1213713001	06/24/2021	06/25/2021	Water (Surface, Eff., Ground)
100972-TWD11	1213713002	06/24/2021	06/25/2021	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Detectable Results Summary

Client Sample ID: **100972-HT11**
Lab Sample ID: 1213713001
Volatile Fuels

Parameter	Result	Units
Benzene	5.81	ug/L
Ethylbenzene	1.57	ug/L
Gasoline Range Organics	0.125	mg/L
o-Xylene	3.98	ug/L
P & M -Xylene	8.71	ug/L
Toluene	11.7	ug/L
Xylenes (total)	12.7	ug/L

Client Sample ID: **100972-TWD11**
Lab Sample ID: 1213713002
Volatile Fuels

Parameter	Result	Units
Benzene	0.230J	ug/L
Gasoline Range Organics	0.0432J	mg/L
Toluene	0.340J	ug/L

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Results of **100972-HT11**

Client Sample ID: **100972-HT11**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1213713001
Lab Project ID: 1213713

Collection Date: 06/24/21 15:10
Received Date: 06/25/21 17:19
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.125		0.100	0.0310	mg/L	1		07/02/21 21:16
Surrogates								
4-Bromofluorobenzene (surr)	92.9		50-150		%	1		07/02/21 21:16

Batch Information

Analytical Batch: VFC15692
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/02/21 21:16
Container ID: 1213713001-A

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 07/02/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.81		0.500	0.150	ug/L	1		07/02/21 21:16
Ethylbenzene	1.57		1.00	0.310	ug/L	1		07/02/21 21:16
o-Xylene	3.98		1.00	0.310	ug/L	1		07/02/21 21:16
P & M -Xylene	8.71		2.00	0.620	ug/L	1		07/02/21 21:16
Toluene	11.7		1.00	0.310	ug/L	1		07/02/21 21:16
Xylenes (total)	12.7		3.00	0.930	ug/L	1		07/02/21 21:16
Surrogates								
1,4-Difluorobenzene (surr)	102		77-115		%	1		07/02/21 21:16

Batch Information

Analytical Batch: VFC15692
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 07/02/21 21:16
Container ID: 1213713001-A

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 07/02/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/09/2021 4:48:11PM

J flagging is activated

Results of **100972-TWD11**

Client Sample ID: **100972-TWD11**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1213713002
Lab Project ID: 1213713

Collection Date: 06/24/21 15:25
Received Date: 06/25/21 17:19
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0432	J	0.100	0.0310	mg/L	1		07/02/21 21:33
Surrogates								
4-Bromofluorobenzene (surr)	86.3		50-150		%	1		07/02/21 21:33

Batch Information

Analytical Batch: VFC15692
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/02/21 21:33
Container ID: 1213713002-A

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 07/02/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.230	J	0.500	0.150	ug/L	1		07/02/21 21:33
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		07/02/21 21:33
o-Xylene	0.500	U	1.00	0.310	ug/L	1		07/02/21 21:33
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		07/02/21 21:33
Toluene	0.340	J	1.00	0.310	ug/L	1		07/02/21 21:33
Xylenes (total)	1.50	U	3.00	0.930	ug/L	1		07/02/21 21:33
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	1		07/02/21 21:33

Batch Information

Analytical Batch: VFC15692
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 07/02/21 21:33
Container ID: 1213713002-A

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 07/02/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/09/2021 4:48:11PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1821967 [VXX/37369]
Blank Lab ID: 1621672

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1213713001, 1213713002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	52	50-150		%

Batch Information

Analytical Batch: VFC15692
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 7/2/2021 11:20:00AM

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 7/2/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1213713 [VXX37369]
Blank Spike Lab ID: 1621677
Date Analyzed: 07/02/2021 10:43

Spike Duplicate ID: LCSD for HBN 1213713 [VXX37369]
Spike Duplicate Lab ID: 1621678
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1213713001, 1213713002

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.15	115	1.00	1.12	112	(60-120)	2.90	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		100	0.0500		101	(50-150)	0.42	

Batch Information

Analytical Batch: **VFC15692**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37369**
Prep Method: **SW5030B**
Prep Date/Time: **07/02/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1821967 [VXX/37369]
Blank Lab ID: 1621672

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1213713001, 1213713002

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	102	77-115		%

Batch Information

Analytical Batch: VFC15692
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 7/2/2021 11:20:00AM

Prep Batch: VXX37369
Prep Method: SW5030B
Prep Date/Time: 7/2/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1213713 [VXX37369]
Blank Spike Lab ID: 1621673
Date Analyzed: 07/02/2021 10:25

Spike Duplicate ID: LCSD for HBN 1213713 [VXX37369]
Spike Duplicate Lab ID: 1621674
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1213713001, 1213713002

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	104	104	100	108	108	(80-120)	3.10	(< 20)
Ethylbenzene	100	88.2	88	100	90.0	90	(75-125)	1.90	(< 20)
o-Xylene	100	85.4	85	100	87.3	87	(80-120)	2.20	(< 20)
P & M -Xylene	200	172	86	200	177	89	(75-130)	3.10	(< 20)
Toluene	100	94.3	94	100	96.4	96	(75-120)	2.20	(< 20)
Xylenes (total)	300	257	86	300	265	88	(79-121)	2.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		105	50		105	(77-115)	0.32	

Batch Information

Analytical Batch: **VFC15692**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37369**
Prep Method: **SW5030B**
Prep Date/Time: **07/02/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

1213713

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

Page 1 of 1

Laboratory SGS Anchorage

Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX AK101/8021B 3x40mL VOA w/HCl						Total Number of Containers	Remarks/Matrix
100972-HT11	1AC	1510	6/24/21		X	X						3	Water
100972-TWD11	2AC	1525	6/24/21		X	X						3	"

Project Information		Sample Receipt	
Project Number:	100972-001	Total Number of Containers	
Project Name:	Sterling Zip Mart	COC Seals/Intact? Y/N/NA	
Contact:	Randy Hessong	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	Zach Thon	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	SGS/STW MSA No trip blank

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1715	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date: 6/25/21	Printed Name: Date:	Printed Name: Date:
Company: STW	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 1719
Printed Name: Date:	Printed Name: Date:	Printed Name: Chris Clemer Date: 06/25/21
Company:	Company:	Company: SGS ANCHORAGE

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 1235246

e-Sample Receipt Form

SGS Workorder #: **1213713**

1 2 1 3 7 1 3

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 @ 1.1 °C Therm. ID: D45
		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,200.8/6020B).
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?	No	No trip blanks received with samples.Proceeded without trip blanks.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
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
1213713001-A	HCL to pH < 2	OK			
1213713001-B	HCL to pH < 2	OK			
1213713001-C	HCL to pH < 2	OK			
1213713002-A	HCL to pH < 2	OK			
1213713002-B	HCL to pH < 2	OK			
1213713002-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1215975**

Client Project: **100972-001 Sterling ZipMart**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1215975**
Project Name/Site: **100972-001 Sterling ZipMart**
Project Contact: **Randy Hessong**

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
100972-HT12	1215975001	09/09/2021	09/13/2021	Water (Surface, Eff., Ground)
100972-TWD12	1215975002	09/09/2021	09/13/2021	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Detectable Results Summary

Client Sample ID: **100972-HT12**
Lab Sample ID: 1215975001
Volatile Fuels

Parameter	Result	Units
Benzene	236	ug/L
Ethylbenzene	32.7	ug/L
Gasoline Range Organics	2.35	mg/L
o-Xylene	279	ug/L
P & M -Xylene	106	ug/L
Toluene	614	ug/L
Xylenes (total)	373	ug/L

Client Sample ID: **100972-TWD12**
Lab Sample ID: 1215975002
Volatile Fuels

Parameter	Result	Units
Benzene	44.0	ug/L
Ethylbenzene	4.51	ug/L
Gasoline Range Organics	0.341	mg/L
o-Xylene	36.8	ug/L
P & M -Xylene	10.7	ug/L
Toluene	77.5	ug/L
Xylenes (total)	52.0	ug/L

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Results of **100972-HT12**

Client Sample ID: **100972-HT12**
Client Project ID: **100972-001 Sterling ZipMart**
Lab Sample ID: 1215975001
Lab Project ID: 1215975

Collection Date: 09/09/21 16:52
Received Date: 09/13/21 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.35		0.100	0.0450	mg/L	1		09/15/21 17:01
Surrogates								
4-Bromofluorobenzene (surr)	84.2		50-150		%	1		09/15/21 17:01

Batch Information

Analytical Batch: VFC15823
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/15/21 17:01
Container ID: 1215975001-A

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 09/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	236		0.500	0.150	ug/L	1		09/15/21 17:01
Ethylbenzene	32.7		1.00	0.500	ug/L	1		09/15/21 17:01
o-Xylene	279		10.0	5.00	ug/L	10		09/16/21 13:42
P & M -Xylene	106		2.00	0.900	ug/L	1		09/15/21 17:01
Toluene	614		10.0	5.00	ug/L	10		09/16/21 13:42
Xylenes (total)	373		3.00	1.40	ug/L	1		09/15/21 17:01
Surrogates								
1,4-Difluorobenzene (surr)	111		77-115		%	1		09/15/21 17:01

Batch Information

Analytical Batch: VFC15826
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 09/16/21 13:42
Container ID: 1215975001-A

Prep Batch: VXX37859
Prep Method: SW5030B
Prep Date/Time: 09/16/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC15823
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 09/15/21 17:01
Container ID: 1215975001-A

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 09/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100972-TWD12**

Client Sample ID: **100972-TWD12**
Client Project ID: **100972-001 Sterling ZipMart**
Lab Sample ID: 1215975002
Lab Project ID: 1215975

Collection Date: 09/09/21 20:33
Received Date: 09/13/21 14:35
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.341		0.100	0.0450	mg/L	1		09/15/21 17:19
Surrogates								
4-Bromofluorobenzene (surr)	77		50-150		%	1		09/15/21 17:19

Batch Information

Analytical Batch: VFC15823
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/15/21 17:19
Container ID: 1215975002-A

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 09/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	44.0		0.500	0.150	ug/L	1		09/16/21 14:39
Ethylbenzene	4.51		1.00	0.500	ug/L	1		09/15/21 17:19
o-Xylene	36.8		1.00	0.500	ug/L	1		09/16/21 14:39
P & M -Xylene	10.7		2.00	0.900	ug/L	1		09/15/21 17:19
Toluene	77.5		1.00	0.500	ug/L	1		09/16/21 14:39
Xylenes (total)	52.0		3.00	1.40	ug/L	1		09/15/21 17:19
Surrogates								
1,4-Difluorobenzene (surr)	90.5		77-115		%	1		09/15/21 17:19

Batch Information

Analytical Batch: VFC15826
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 09/16/21 14:39
Container ID: 1215975002-A

Prep Batch: VXX37859
Prep Method: SW5030B
Prep Date/Time: 09/16/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC15823
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 09/15/21 17:19
Container ID: 1215975002-A

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 09/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2021 8:40:42AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1825604 [VXX/37852]
Blank Lab ID: 1636640

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1215975001, 1215975002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	79	50-150		%

Batch Information

Analytical Batch: VFC15823
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: IJV
Analytical Date/Time: 9/15/2021 10:17:00AM

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 9/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215975 [VXX37852]
Blank Spike Lab ID: 1636643
Date Analyzed: 09/15/2021 10:53

Spike Duplicate ID: LCSD for HBN 1215975 [VXX37852]
Spike Duplicate Lab ID: 1636644
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215975001, 1215975002

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.975	98	1.00	0.974	97	(60-120)	0.05	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		88	0.0500		89	(50-150)	0.50	

Batch Information

Analytical Batch: **VFC15823**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **IJV**

Prep Batch: **VXX37852**
Prep Method: **SW5030B**
Prep Date/Time: **09/15/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1825604 [VXX/37852]
Blank Lab ID: 1636640

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1215975001, 1215975002

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	87.5	77-115		%

Batch Information

Analytical Batch: VFC15823
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: IJV
Analytical Date/Time: 9/15/2021 10:17:00AM

Prep Batch: VXX37852
Prep Method: SW5030B
Prep Date/Time: 9/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1215975 [VXX37852]
Blank Spike Lab ID: 1636641
Date Analyzed: 09/15/2021 11:11

Spike Duplicate ID: LCSD for HBN 1215975 [VXX37852]
Spike Duplicate Lab ID: 1636642
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215975001, 1215975002

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	114	114	100	119	119	(80-120)	3.90	(< 20)
Ethylbenzene	100	115	115	100	119	119	(75-125)	3.50	(< 20)
P & M -Xylene	200	227	114	200	235	117	(75-130)	3.20	(< 20)
Xylenes (total)	300	334	111	300	345	115	(79-121)	3.30	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		100	50		100	(77-115)	0.58	

Batch Information

Analytical Batch: **VFC15823**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **IJV**

Prep Batch: **VXX37852**
Prep Method: **SW5030B**
Prep Date/Time: **09/15/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1825652 [VXX/37859]
Blank Lab ID: 1636824

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1215975001, 1215975002

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	86.8	77-115		%

Batch Information

Analytical Batch: VFC15826
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: IJV
Analytical Date/Time: 9/16/2021 10:27:00AM

Prep Batch: VXX37859
Prep Method: SW5030B
Prep Date/Time: 9/16/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215975 [VXX37859]
Blank Spike Lab ID: 1636825
Date Analyzed: 09/16/2021 11:03

Spike Duplicate ID: LCSD for HBN 1215975 [VXX37859]
Spike Duplicate Lab ID: 1636826
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215975001, 1215975002

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	108	108	100	106	106	(80-120)	2.20	(< 20)
o-Xylene	100	98.3	98	100	95.9	96	(80-120)	2.50	(< 20)
Toluene	100	111	111	100	110	110	(75-120)	0.68	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		96	50		96	(77-115)	0.02	

Batch Information

Analytical Batch: **VFC15826**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **IJV**

Prep Batch: **VXX37859**
Prep Method: **SW5030B**
Prep Date/Time: **09/16/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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1215975

334871 XD

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

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Seattle, WA 98103
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1321 Bannock Street, Suite 200
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2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

1 cooler

Page 1 of 1

Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX AK101/SW8021 3x40mL w/HCl					Total Number of Containers	Remarks/Matrix
100972-HT12	1 A-C	16:52	9/9/21		X	X					3	Water Low to medium concentration
100972-TWD12	2 A-C	20:33	9/9/21		X	X					3	" Low to No Concentration

Project Information	Sample Receipt
Project Number: 100972-001	Total Number of Containers
Project Name: Sterling ZipMart	COC Seals/Intact? Y/N/NA
Contact: Randy Hessong	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: RZH	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: Standard
Special Instructions: No Trip blank S&W/SGS MSA

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 14:35	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date: 9/13/21	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 1435
Printed Name: Date:	Printed Name: Date:	Printed Name: Michelle A Warren Date: 9/13/21
Company:	Company:	Company: SGS HD. Absent 4.5 DLS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 14 35247

e-Sample Receipt Form

SGS Workorder #: 1215975

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, HD
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)?	Yes	Cooler ID: 1 @ 4.5 °C Therm. ID: D65
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?	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 informatio		
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?	No	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
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
1215975001-A	HCL to pH < 2	OK			
1215975001-B	HCL to pH < 2	OK			
1215975001-C	HCL to pH < 2	OK			
1215975002-A	HCL to pH < 2	OK			
1215975002-B	HCL to pH < 2	OK			
1215975002-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1216720**

Client Project: **100972-001 Sterling Zip Mart**

Dear Randy Hessong,

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

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Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1216720**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Randy Hessong**

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.

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*	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
100972-UV13	1216720001	10/07/2021	10/08/2021	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

Print Date: 10/20/2021 12:59:15PM

Detectable Results Summary

Client Sample ID: **100972-UV13**
Lab Sample ID: 1216720001

Volatile Fuels

Parameter	Result	Units
Benzene	4310	ug/L
Ethylbenzene	1490	ug/L
Gasoline Range Organics	63.4	mg/L
o-Xylene	4140	ug/L
P & M -Xylene	9200	ug/L
Toluene	11100	ug/L
Xylenes (total)	13300	ug/L

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Results of **100972-UV13**

Client Sample ID: **100972-UV13**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1216720001
Lab Project ID: 1216720

Collection Date: 10/07/21 19:15
Received Date: 10/08/21 14:30
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	63.4		10.0	4.50	mg/L	100		10/15/21 19:34
Surrogates								
4-Bromofluorobenzene (surr)	92.7		50-150		%	100		10/15/21 19:34

Batch Information

Analytical Batch: VFC15893
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 10/15/21 19:34
Container ID: 1216720001-B

Prep Batch: VXX38030
Prep Method: SW5030B
Prep Date/Time: 10/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	4310		50.0	15.0	ug/L	100		10/15/21 19:34
Ethylbenzene	1490		100	50.0	ug/L	100		10/15/21 19:34
o-Xylene	4140		100	50.0	ug/L	100		10/15/21 19:34
P & M -Xylene	9200		200	90.0	ug/L	100		10/15/21 19:34
Toluene	11100		100	50.0	ug/L	100		10/15/21 19:34
Xylenes (total)	13300		300	140	ug/L	100		10/15/21 19:34
Surrogates								
1,4-Difluorobenzene (surr)	91.4		77-115		%	100		10/15/21 19:34

Batch Information

Analytical Batch: VFC15893
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 10/15/21 19:34
Container ID: 1216720001-B

Prep Batch: VXX38030
Prep Method: SW5030B
Prep Date/Time: 10/15/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/20/2021 12:59:18PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1827240 [VXX/38030]
Blank Lab ID: 1642599

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1216720001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	92.5	50-150		%

Batch Information

Analytical Batch: VFC15893
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: IJV
Analytical Date/Time: 10/15/2021 11:40:00AM

Prep Batch: VXX38030
Prep Method: SW5030B
Prep Date/Time: 10/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1216720 [VXX38030]
Blank Spike Lab ID: 1642602
Date Analyzed: 10/15/2021 12:34

Spike Duplicate ID: LCSD for HBN 1216720 [VXX38030]
Spike Duplicate Lab ID: 1642603
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216720001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.950	95	1.00	0.948	95	(60-120)	0.22	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		111	0.0500		102	(50-150)	8.10	

Batch Information

Analytical Batch: **VFC15893**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38030**
Prep Method: **SW5030B**
Prep Date/Time: **10/15/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1827240 [VXX/38030]
Blank Lab ID: 1642599

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1216720001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.300J	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	87.6	77-115		%

Batch Information

Analytical Batch: VFC15893
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: IJV
Analytical Date/Time: 10/15/2021 11:40:00AM

Prep Batch: VXX38030
Prep Method: SW5030B
Prep Date/Time: 10/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/20/2021 12:59:25PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216720 [VXX38030]
Blank Spike Lab ID: 1642600
Date Analyzed: 10/15/2021 12:16

Spike Duplicate ID: LCSD for HBN 1216720 [VXX38030]
Spike Duplicate Lab ID: 1642601
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216720001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	97.3	97	100	102	102	(80-120)	5.10	(< 20)
Ethylbenzene	100	99.3	99	100	104	104	(75-125)	4.90	(< 20)
o-Xylene	100	95.1	95	100	99.3	99	(80-120)	4.30	(< 20)
P & M -Xylene	200	196	98	200	206	103	(75-130)	5.00	(< 20)
Toluene	100	102	102	100	107	107	(75-120)	5.00	(< 20)
Xylenes (total)	300	291	97	300	306	102	(79-121)	4.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		99	50		103	(77-115)	4.00	

Batch Information

Analytical Batch: **VFC15893**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38030**
Prep Method: **SW5030B**
Prep Date/Time: **10/15/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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PM #334871 AD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

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3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

CHAIN-OF-CUSTODY RECORD

Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

1216720

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX #K101/8021B 3x40mL VOA HCL							
100972-UV13	IAC	1915	10/7/21		X	X						3	Water Lifels High concentration

Project Information		Sample Receipt	
Project Number:	100972-001	Total Number of Containers	
Project Name:	Sterling Pipmart	COC Seals/Intact? Y/N/NA	
Contact:	Randy Hessong	Received Good Cond./Cold	
Ongoing Project?	Yes ☑ No ☐	Delivery Method:	
Sampler:	Randy Hessong	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	S+W/SGS PSA No trip blank

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 14:30	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date: 10/8/21	Printed Name: Date:	Printed Name: Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 14:30
Printed Name: Date:	Printed Name: Date:	Printed Name: Ryan Conlon Date: 10/8/21
Company:	Company:	Company: SGS Absent HD

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

5.8 DS

No. 35248

e-Sample Receipt Form

SGS Workorder #: **1216720**

1 2 1 6 7 2 0

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 @ 5.8 °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,200.8/6020B).
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?	No	No trip blank received .Proceeded per history
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
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
1216720001-A	HCL to pH < 2	OK			
1216720001-B	HCL to pH < 2	OK			
1216720001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1217344**

Client Project: **100972-001 Sterling ZipMart**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1217344**
Project Name/Site: **100972-001 Sterling ZipMart**
Project Contact: **Randy Hessong**

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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CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
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ICV	Initial Calibration Verification
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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)
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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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100972-HT13	1217344001	11/03/2021	11/04/2021	Water (Surface, Eff., Ground)
100972-TWD13	1217344002	11/03/2021	11/04/2021	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Detectable Results Summary

Client Sample ID: **100972-HT13**
Lab Sample ID: 1217344001
Volatile Fuels

Parameter	Result	Units
Benzene	317	ug/L
Ethylbenzene	71.3	ug/L
Gasoline Range Organics	4.20	mg/L
o-Xylene	337	ug/L
P & M -Xylene	564	ug/L
Toluene	707	ug/L
Xylenes (total)	902	ug/L

Client Sample ID: **100972-TWD13**
Lab Sample ID: 1217344002
Volatile Fuels

Parameter	Result	Units
Benzene	129	ug/L
Ethylbenzene	26.1	ug/L
Gasoline Range Organics	1.90	mg/L
o-Xylene	127	ug/L
P & M -Xylene	197	ug/L
Toluene	259	ug/L
Xylenes (total)	324	ug/L

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Results of **100972-HT13**

Client Sample ID: **100972-HT13**
Client Project ID: **100972-001 Sterling ZipMart**
Lab Sample ID: 1217344001
Lab Project ID: 1217344

Collection Date: 11/03/21 18:55
Received Date: 11/04/21 16:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	4.20		1.00	0.450	mg/L	10		11/08/21 19:19
Surrogates								
4-Bromofluorobenzene (surr)	89.6		50-150		%	10		11/08/21 19:19

Batch Information

Analytical Batch: VFC15936
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 11/08/21 19:19
Container ID: 1217344001-B

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/08/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	317		5.00	1.50	ug/L	10		11/08/21 19:19
Ethylbenzene	71.3		10.0	5.00	ug/L	10		11/08/21 19:19
o-Xylene	337		10.0	5.00	ug/L	10		11/08/21 19:19
P & M -Xylene	564		20.0	9.00	ug/L	10		11/08/21 19:19
Toluene	707		10.0	5.00	ug/L	10		11/08/21 19:19
Xylenes (total)	902		30.0	14.0	ug/L	10		11/08/21 19:19
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	10		11/08/21 19:19

Batch Information

Analytical Batch: VFC15936
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 11/08/21 19:19
Container ID: 1217344001-B

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/08/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2021 8:38:50AM

J flagging is activated

Results of **100972-TWD13**

Client Sample ID: **100972-TWD13**
Client Project ID: **100972-001 Sterling ZipMart**
Lab Sample ID: 1217344002
Lab Project ID: 1217344

Collection Date: 11/03/21 19:40
Received Date: 11/04/21 16:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.90		1.00	0.450	mg/L	10		11/08/21 19:37
Surrogates								
4-Bromofluorobenzene (surr)	90.3		50-150		%	10		11/08/21 19:37

Batch Information

Analytical Batch: VFC15936
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 11/08/21 19:37
Container ID: 1217344002-B

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/08/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	129		5.00	1.50	ug/L	10		11/08/21 19:37
Ethylbenzene	26.1		10.0	5.00	ug/L	10		11/08/21 19:37
o-Xylene	127		10.0	5.00	ug/L	10		11/08/21 19:37
P & M -Xylene	197		20.0	9.00	ug/L	10		11/08/21 19:37
Toluene	259		10.0	5.00	ug/L	10		11/08/21 19:37
Xylenes (total)	324		30.0	14.0	ug/L	10		11/08/21 19:37
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	10		11/08/21 19:37

Batch Information

Analytical Batch: VFC15936
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 11/08/21 19:37
Container ID: 1217344002-B

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/08/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2021 8:38:50AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1828305 [VXX/38157]
Blank Lab ID: 1646619

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1217344001, 1217344002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	86.7	50-150		%

Batch Information

Analytical Batch: VFC15936
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 11/8/2021 9:08:00AM

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/8/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1217344 [VXX38157]
Blank Spike Lab ID: 1646622
Date Analyzed: 11/08/2021 10:01

Spike Duplicate ID: LCSD for HBN 1217344 [VXX38157]
Spike Duplicate Lab ID: 1646623
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1217344001, 1217344002

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.00	100	1.00	0.978	98	(60-120)	2.70	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		100	0.0500		98	(50-150)	2.30	

Batch Information

Analytical Batch: **VFC15936**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38157**
Prep Method: **SW5030B**
Prep Date/Time: **11/08/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1828305 [VXX/38157]
Blank Lab ID: 1646619

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1217344001, 1217344002

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	99	77-115		%

Batch Information

Analytical Batch: VFC15936
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 11/8/2021 9:08:00AM

Prep Batch: VXX38157
Prep Method: SW5030B
Prep Date/Time: 11/8/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1217344 [VXX38157]
Blank Spike Lab ID: 1646620
Date Analyzed: 11/08/2021 09:43

Spike Duplicate ID: LCSD for HBN 1217344 [VXX38157]
Spike Duplicate Lab ID: 1646621
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1217344001, 1217344002

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	114	114	100	116	116	(80-120)	1.80	(< 20)
Ethylbenzene	100	104	104	100	104	104	(75-125)	0.08	(< 20)
o-Xylene	100	101	101	100	100	100	(80-120)	0.79	(< 20)
P & M -Xylene	200	207	104	200	205	102	(75-130)	1.20	(< 20)
Toluene	100	108	108	100	108	108	(75-120)	0.05	(< 20)
Xylenes (total)	300	308	103	300	305	102	(79-121)	1.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		106	50		107	(77-115)	0.55	

Batch Information

Analytical Batch: **VFC15936**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38157**
Prep Method: **SW5030B**
Prep Date/Time: **11/08/2021 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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CHAIN OF CUSTODY RECORD

1217344

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

Page ____ of ____

Section 1

CLIENT: Shannon & Wilson, Inc., Anchorage

CONTACT: Randy Hessong

PHONE #: (907) 441-9295

PROJECT NAME: Sterling ZipMart

PROJECT/ PWSID/ PERMIT#: 100972-001

REPORTS TO: Randy Hessong

E-MAIL: randy.hessong@shanwil.com

Profile #: 334871 M

INVOICE TO: AP- Anchorage

QUOTE #: SAW/SLS MSA

P.O. #:

Section 3 — Preservative

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*: GRO/BTEX AK101/8021B 3xVOA	HCl	REMARKS/LOC ID
1AC	100972-HT13	11/3/21	18:55	GW			X		Likely medium concentration. One VOA has bubble
2AC	100972-TWD13	11/3/21	19:40	GW			X		Likely low concentration

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

Section 5

	Date	Time	
Relinquished By: (1)	11/4/21	1639	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	11/4/21	1636	Received For Laboratory By: MM

Section 4

DOD Project? Yes (No)

Data Deliverable Requirements:

Cooler ID: 1

Requested Turnaround Time and/or Special Instructions:
Standard. No trip blank

Temp Blank °C: 1.5 D68 or Ambient [ ]

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

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: 1217344

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 @ 1.5 °C Therm. ID: D60
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?	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,200.8/6020B).
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?	No	No trip blank per client.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
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
1217344001-A	HCL to pH < 2	OK			
1217344001-B	HCL to pH < 2	OK			
1217344001-C	HCL to pH < 2	OK			
1217344002-A	HCL to pH < 2	OK			
1217344002-B	HCL to pH < 2	OK			
1217344002-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Suite 3
Anchorage, AK 99518

Report Number: **1224862**

Client Project: **100972-104 Zip Mart**

Dear Zach Thon,

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: **Shannon & Wilson, Inc.**
SGS Project: **1224862**
Project Name/Site: **100972-104 Zip Mart**
Project Contact: **Zach Thon**

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
100972-UV21	1224862001	08/15/2022	08/16/2022	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Detectable Results Summary

Client Sample ID: **100972-UV21**
Lab Sample ID: 1224862001

Volatile Fuels

Parameter	Result	Units
Benzene	3720	ug/L
Ethylbenzene	1690	ug/L
Gasoline Range Organics	62.2	mg/L
o-Xylene	4080	ug/L
P & M -Xylene	9510	ug/L
Toluene	9790	ug/L
Xylenes (total)	13600	ug/L

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Results of **100972-UV21**

Client Sample ID: **100972-UV21**
Client Project ID: **100972-104 Zip Mart**
Lab Sample ID: 1224862001
Lab Project ID: 1224862

Collection Date: 08/15/22 20:00
Received Date: 08/16/22 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	62.2		10.0	4.50	mg/L	100		08/19/22 18:07
Surrogates								
4-Bromofluorobenzene (surr)	98		50-150		%	100		08/19/22 18:07

Batch Information

Analytical Batch: VFC16223
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/19/22 18:07
Container ID: 1224862001-B

Prep Batch: VXX39040
Prep Method: SW5030B
Prep Date/Time: 08/19/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	3720		50.0	15.0	ug/L	100		08/19/22 18:07
Ethylbenzene	1690		100	50.0	ug/L	100		08/19/22 18:07
o-Xylene	4080		100	50.0	ug/L	100		08/19/22 18:07
P & M -Xylene	9510		200	90.0	ug/L	100		08/19/22 18:07
Toluene	9790		100	50.0	ug/L	100		08/19/22 18:07
Xylenes (total)	13600		300	140	ug/L	100		08/19/22 18:07
Surrogates								
1,4-Difluorobenzene (surr)	89.6		77-115		%	100		08/19/22 18:07

Batch Information

Analytical Batch: VFC16223
Analytical Method: SW8021B
Analyst: PHK
Analytical Date/Time: 08/19/22 18:07
Container ID: 1224862001-B

Prep Batch: VXX39040
Prep Method: SW5030B
Prep Date/Time: 08/19/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/24/2022 2:33:53PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1841839 [VXX/39040]
Blank Lab ID: 1680659

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224862001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	75.5	50-150		%

Batch Information

Analytical Batch: VFC16223
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 8/19/2022 2:34:00PM

Prep Batch: VXX39040
Prep Method: SW5030B
Prep Date/Time: 8/19/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1224862 [VXX39040]
Blank Spike Lab ID: 1680662
Date Analyzed: 08/19/2022 13:32

Spike Duplicate ID: LCSD for HBN 1224862 [VXX39040]
Spike Duplicate Lab ID: 1680663
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224862001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	0.946	95	(60-120)	6.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		113	0.0500		99	(50-150)	12.80	

Batch Information

Analytical Batch: **VFC16223**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39040**
Prep Method: **SW5030B**
Prep Date/Time: **08/19/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1841839 [VXX/39040]
Blank Lab ID: 1680659

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224862001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	87.4	77-115		%

Batch Information

Analytical Batch: VFC16223
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 8/19/2022 2:34:00PM

Prep Batch: VXX39040
Prep Method: SW5030B
Prep Date/Time: 8/19/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/24/2022 2:33:59PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224862 [VXX39040]
Blank Spike Lab ID: 1680660
Date Analyzed: 08/19/2022 13:14

Spike Duplicate ID: LCSD for HBN 1224862 [VXX39040]
Spike Duplicate Lab ID: 1680661
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224862001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	105	105	100	110	110	(80-120)	4.60	(< 20)
Ethylbenzene	100	101	101	100	104	104	(75-125)	3.20	(< 20)
o-Xylene	100	100	100	100	102	102	(80-120)	2.20	(< 20)
P & M -Xylene	200	202	101	200	208	104	(75-130)	3.00	(< 20)
Toluene	100	101	101	100	106	106	(75-120)	5.00	(< 20)
Xylenes (total)	300	302	101	300	310	103	(79-121)	2.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		101	50		100	(77-115)	0.28	

Batch Information

Analytical Batch: **VFC16223**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39040**
Prep Method: **SW5030B**
Prep Date/Time: **08/19/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

1224862

Profile# 365753 DBL

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

SGS North America I

Date	Time	Sample ID	Total Containers	GRO-AK101 VOA Vials HCl	BTEX - SW8021B VOA Vials HCl						
8/15/2022	20:00	**100972-UV21**	3	X	X						

Relinquished By:	**Relinquished By:**	**Project Information**
Signature:	Signature:	Project Number: 100972-401
Print Name: Zach Thon	Print Name:	Project Name: ZipMart
Company: Shannon & Wilson, Inc.	Company:	Contact: Stafford Glashan, Randy Hessong
Date: 8/16/2022	Date:	Sampler: ZJT
Time: 10:23	Time:	Special Instructions: Likely High Concentration
Received By:	**Received By:**	**Sample Receipt**
Signature:	Signature:	Shipped Via: Hand Delivered
Print Name:	Print Name: Nolan Markovich	
Company:	Company: SGS	Cooler Temperature Upon Arrival:
Date:	Date: 8/16/22	Sample Matrix: Water
Time:	Time: 10:24	**10 Working DAY TAT**

2.9°C DG2

e-Sample Receipt Form

SGS Workorder #: 1224862

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements		*Note:* Temperature and COC seal information is found on the chain of custody form
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	No	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1224862001-A	HCL to pH < 2	OK			
1224862001-B	HCL to pH < 2	OK			
1224862001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Suite 3
Anchorage, AK 99518

Report Number: **1225681**

Client Project: **100972-001 Sterling Zip Mart**

Dear Zach Thon,

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: **Shannon & Wilson, Inc.**
SGS Project: **1225681**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Zach Thon**

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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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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t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100972-HT21	1225681001	09/16/2022	09/19/2022	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

Print Date: 09/22/2022 12:22:19PM

Results of **100972-HT21**

Client Sample ID: **100972-HT21**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1225681001
Lab Project ID: 1225681

Collection Date: 09/16/22 16:30
Received Date: 09/19/22 15:46
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0450	mg/L	1		09/20/22 18:31
Surrogates								
4-Bromofluorobenzene (surr)	84.3		50-150		%	1		09/20/22 18:31

Batch Information

Analytical Batch: VFC16259
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/20/22 18:31
Container ID: 1225681001-A

Prep Batch: VXX39203
Prep Method: SW5030B
Prep Date/Time: 09/20/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		09/20/22 18:31
Ethylbenzene	0.500	U	1.00	0.500	ug/L	1		09/20/22 18:31
o-Xylene	0.500	U	1.00	0.500	ug/L	1		09/20/22 18:31
P & M -Xylene	1.00	U	2.00	0.900	ug/L	1		09/20/22 18:31
Toluene	0.500	U	1.00	0.500	ug/L	1		09/20/22 18:31
Xylenes (total)	1.50	U	3.00	1.40	ug/L	1		09/20/22 18:31
Surrogates								
1,4-Difluorobenzene (surr)	89		77-115		%	1		09/20/22 18:31

Batch Information

Analytical Batch: VFC16259
Analytical Method: SW8021B
Analyst: PHK
Analytical Date/Time: 09/20/22 18:31
Container ID: 1225681001-A

Prep Batch: VXX39203
Prep Method: SW5030B
Prep Date/Time: 09/20/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1844014 [VXX/39203]
Blank Lab ID: 1686914

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225681001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.9	50-150		%

Batch Information

Analytical Batch: VFC16259
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 9/20/2022 12:40:00PM

Prep Batch: VXX39203
Prep Method: SW5030B
Prep Date/Time: 9/20/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
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Blank Spike Summary

Blank Spike ID: LCS for HBN 1225681 [VXX39203]
Blank Spike Lab ID: 1686917
Date Analyzed: 09/20/2022 13:35

Spike Duplicate ID: LCSD for HBN 1225681 [VXX39203]
Spike Duplicate Lab ID: 1686918
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225681001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.972	97	1.00	0.937	94	(60-120)	3.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		98	0.0500		89	(50-150)	9.80	

Batch Information

Analytical Batch: **VFC16259**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39203**
Prep Method: **SW5030B**
Prep Date/Time: **09/20/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1844014 [VXX/39203]
Blank Lab ID: 1686914

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225681001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	89.1	77-115		%

Batch Information

Analytical Batch: VFC16259
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 9/20/2022 12:40:00PM

Prep Batch: VXX39203
Prep Method: SW5030B
Prep Date/Time: 9/20/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/22/2022 12:22:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1225681 [VXX39203]
Blank Spike Lab ID: 1686915
Date Analyzed: 09/20/2022 13:16

Spike Duplicate ID: LCSD for HBN 1225681 [VXX39203]
Spike Duplicate Lab ID: 1686916
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225681001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	104	104	100	111	111	(80-120)	6.40	(< 20)
Ethylbenzene	100	97.6	98	100	106	106	(75-125)	7.90	(< 20)
o-Xylene	100	95.2	95	100	105	105	(80-120)	10.20	(< 20)
P & M -Xylene	200	194	97	200	212	106	(75-130)	8.60	(< 20)
Toluene	100	99.0	99	100	107	107	(75-120)	8.10	(< 20)
Xylenes (total)	300	289	96	300	317	106	(79-121)	9.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		100	50		102	(77-115)	1.80	

Batch Information

Analytical Batch: **VFC16259**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39203**
Prep Method: **SW5030B**
Prep Date/Time: **09/20/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

1225681

P# 365753 KF

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

1 cooler

Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX AK101/5030B 3 HCl w/HCl						Total Number of Containers	Remarks/Matrix
100972-HT21		9/16/22	16:30		X	X						3	Water

Project Information		Sample Receipt	
Project Number:	100972-001	Total Number of Containers	
Project Name:	Sterling Ziplock	COC Seals/Intact? Y/N/NA	
Contact:	Zach Thon	Received Good Cond./Cold	
Ongoing Project?	Yes ☑ No ☐	Delivery Method:	
Sampler:	Randy Hessong	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	No trip blank S&W/SGS MSA

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 15:45	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date:	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 15:06 DLF
Printed Name: Date:	Printed Name: Date:	Printed Name: Daniel Fennessy Date: 30 Sep 26
Company:	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 35129

e-Sample Receipt Form

SGS Workorder #:	1225681	1225681

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements	*Note:* Temperature and COC seal information is found on the chain of custody form	
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.	
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	No	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1225681001-A	HCL to pH < 2	OK			
1225681001-B	HCL to pH < 2	OK			
1225681001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1225800**

Client Project: **100972-501 Zipmart-Sept. 2022**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1225800**
Project Name/Site: **100972-501 Zipmart-Sept. 2022**
Project Contact: **Randy Hessong**

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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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
100972-TWD21	1225800001	09/22/2022	09/23/2022	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

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Results of **100972-TWD21**

Client Sample ID: **100972-TWD21**
Client Project ID: **100972-501 Zipmart-Sept. 2022**
Lab Sample ID: 1225800001
Lab Project ID: 1225800

Collection Date: 09/22/22 17:00
Received Date: 09/23/22 11:20
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0450	mg/L	1		09/27/22 21:49
Surrogates								
4-Bromofluorobenzene (surr)	80.9		50-150		%	1		09/27/22 21:49

Batch Information

Analytical Batch: VFC16270
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 09/27/22 21:49
Container ID: 1225800001-B

Prep Batch: VXX39243
Prep Method: SW5030B
Prep Date/Time: 09/27/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		09/26/22 18:48
Ethylbenzene	0.500	U	1.00	0.500	ug/L	1		09/26/22 18:48
o-Xylene	0.500	U	1.00	0.500	ug/L	1		09/26/22 18:48
P & M -Xylene	1.00	U	2.00	0.900	ug/L	1		09/26/22 18:48
Toluene	0.500	U	1.00	0.500	ug/L	1		09/26/22 18:48
Xylenes (total)	1.50	U	3.00	1.40	ug/L	1		09/26/22 18:48
Surrogates								
1,4-Difluorobenzene (surr)	90.3		77-115		%	1		09/26/22 18:48

Batch Information

Analytical Batch: VFC16268
Analytical Method: SW8021B
Analyst: PHK
Analytical Date/Time: 09/26/22 18:48
Container ID: 1225800001-A

Prep Batch: VXX39235
Prep Method: SW5030B
Prep Date/Time: 09/26/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/28/2022 4:16:34PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1844282 [VXX/39235]
Blank Lab ID: 1688014

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225800001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	89.9	77-115		%

Batch Information

Analytical Batch: VFC16268
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 9/26/2022 12:34:00PM

Prep Batch: VXX39235
Prep Method: SW5030B
Prep Date/Time: 9/26/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/28/2022 4:16:36PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1225800 [VXX39235]
Blank Spike Lab ID: 1688015
Date Analyzed: 09/26/2022 13:10

Spike Duplicate ID: LCSD for HBN 1225800 [VXX39235]
Spike Duplicate Lab ID: 1688016
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225800001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	105	105	100	113	113	(80-120)	7.70	(< 20)
Ethylbenzene	100	92.1	92	100	98.1	98	(75-125)	6.30	(< 20)
o-Xylene	100	87.7	88	100	92.2	92	(80-120)	5.00	(< 20)
P & M -Xylene	200	181	90	200	192	96	(75-130)	6.00	(< 20)
Toluene	100	98.6	99	100	107	107	(75-120)	7.80	(< 20)
Xylenes (total)	300	269	90	300	284	95	(79-121)	5.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		100	50		100	(77-115)	0.04	

Batch Information

Analytical Batch: **VFC16268**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39235**
Prep Method: **SW5030B**
Prep Date/Time: **09/26/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1844336 [VXX/39243]
Blank Lab ID: 1688268

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225800001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	85.7	50-150		%

Batch Information

Analytical Batch: VFC16270
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: PHK
Analytical Date/Time: 9/27/2022 12:37:00PM

Prep Batch: VXX39243
Prep Method: SW5030B
Prep Date/Time: 9/27/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1225800 [VXX39243]
Blank Spike Lab ID: 1688271
Date Analyzed: 09/27/2022 13:33

Spike Duplicate ID: LCSD for HBN 1225800 [VXX39243]
Spike Duplicate Lab ID: 1688272
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225800001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.05	105	1.00	1.05	105	(60-120)	0.38	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		90	0.0500		88	(50-150)	2.70	

Batch Information

Analytical Batch: **VFC16270**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39243**
Prep Method: **SW5030B**
Prep Date/Time: **09/27/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

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1225800

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

Profile #334891 GJ

1 AC

SGS North America Inc.

Date	Time	Sample ID	Total Containers	GRO-AK101 VOA Vials HCl	BTEX - SW8021B VOA Vials HCl						
9/22/2022	17:00	100972-TWD21	3	X	X						

Relinquished By:	Relinquished By:	Project Information
Signature:	Signature:	Project Number: 100972-501
Print Name: Zach Thon	Print Name:	Project Name: Zipmart - Sept. 2022
Company: Shannon & Wilson, Inc.	Company:	Contact: Zach Thon, Randy Hessong
Date: 9/23/23	Date:	Sampler: ZJT
Time: 11:20	Time:	Special Instructions:
Received By:	**Received By:**	**Sample Receipt**
Signature:	Signature: CJS	Shipped Via: Hand Delivered
Print Name:	Print Name: Chris Schimberg	
Company:	Company: SGS	Cooler Temperature Upon Arrival: 0.8 D23
Date:	Date: 9/23/22	Sample Matrix: Water
Time:	Time: 11:20	**10 Working DAY TAT**

e-Sample Receipt Form

SGS Workorder #:	1225800	1225800

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements	*Note:* Temperature and COC seal information is found on the chain of custody form	
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.	
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1225800001-A	HCL to pH < 2	OK			
1225800001-B	HCL to pH < 2	OK			
1225800001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1225911**

Client Project: **100972 Zipmart**

Dear Randy Hessong,

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: **Shannon & Wilson, Inc.**
SGS Project: **1225911**
Project Name/Site: **100972 Zipmart**
Project Contact: **Randy Hessong**

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

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CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
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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
100972-UV22	1225911001	09/27/2022	09/28/2022	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

Print Date: 10/06/2022 7:28:21AM

Detectable Results Summary

Client Sample ID: **100972-UV22**
Lab Sample ID: 1225911001

Volatile Fuels

Parameter	Result	Units
Benzene	9480	ug/L
Ethylbenzene	1890	ug/L
Gasoline Range Organics	97.2	mg/L
o-Xylene	4170	ug/L
P & M -Xylene	9120	ug/L
Toluene	19800	ug/L
Xylenes (total)	13300	ug/L

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Results of **100972-UV22**

Client Sample ID: **100972-UV22**
Client Project ID: **100972 Zipmart**
Lab Sample ID: 1225911001
Lab Project ID: 1225911

Collection Date: 09/27/22 13:45
Received Date: 09/28/22 09:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	97.2		10.0	4.50	mg/L	100		10/03/22 20:01
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	100		10/03/22 20:01

Batch Information

Analytical Batch: VFC16279
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 10/03/22 20:01
Container ID: 1225911001-C

Prep Batch: VXX39277
Prep Method: SW5030B
Prep Date/Time: 10/03/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9480		50.0	15.0	ug/L	100		10/03/22 20:01
Ethylbenzene	1890		100	50.0	ug/L	100		10/03/22 20:01
o-Xylene	4170		100	50.0	ug/L	100		10/03/22 20:01
P & M -Xylene	9120		200	90.0	ug/L	100		10/03/22 20:01
Toluene	19800		100	50.0	ug/L	100		10/03/22 20:01
Xylenes (total)	13300		300	140	ug/L	100		10/03/22 20:01
Surrogates								
1,4-Difluorobenzene (surr)	99.3		77-115		%	100		10/03/22 20:01

Batch Information

Analytical Batch: VFC16279
Analytical Method: SW8021B
Analyst: PHK
Analytical Date/Time: 10/03/22 20:01
Container ID: 1225911001-C

Prep Batch: VXX39277
Prep Method: SW5030B
Prep Date/Time: 10/03/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/06/2022 7:28:23AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1844935 [VXX/39277]
Blank Lab ID: 1689518

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225911001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	68.6	50-150		%

Batch Information

Analytical Batch: VFC16279
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 10/3/2022 11:57:00AM

Prep Batch: VXX39277
Prep Method: SW5030B
Prep Date/Time: 10/3/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1225911 [VXX39277]
Blank Spike Lab ID: 1689521
Date Analyzed: 10/03/2022 12:52

Spike Duplicate ID: LCSD for HBN 1225911 [VXX39277]
Spike Duplicate Lab ID: 1689522
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225911001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.879	88	1.00	1.00	100	(60-120)	13.10	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		84	0.0500		98	(50-150)	15.60	

Batch Information

Analytical Batch: **VFC16279**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39277**
Prep Method: **SW5030B**
Prep Date/Time: **10/03/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1844935 [VXX/39277]
Blank Lab ID: 1689518

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1225911001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	89.6	77-115		%

Batch Information

Analytical Batch: VFC16279
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 10/3/2022 11:57:00AM

Prep Batch: VXX39277
Prep Method: SW5030B
Prep Date/Time: 10/3/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1225911 [VXX39277]
Blank Spike Lab ID: 1689519
Date Analyzed: 10/03/2022 12:34

Spike Duplicate ID: LCSD for HBN 1225911 [VXX39277]
Spike Duplicate Lab ID: 1689520
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1225911001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	101	101	100	109	109	(80-120)	6.90	(< 20)
Ethylbenzene	100	87.3	87	100	90.5	91	(75-125)	3.60	(< 20)
o-Xylene	100	83.4	83	100	83.9	84	(80-120)	0.63	(< 20)
P & M -Xylene	200	168	84	200	173	86	(75-130)	2.60	(< 20)
Toluene	100	91.7	92	100	97.1	97	(75-120)	5.80	(< 20)
Xylenes (total)	300	252	84	300	257	86	(79-121)	2.00	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		99	50		102	(77-115)	2.90	

Batch Information

Analytical Batch: **VFC16279**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39277**
Prep Method: **SW5030B**
Prep Date/Time: **10/03/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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1225911

Profile# 534871 Q1

SGS North America In

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

Date	Time	Sample ID	Total Containers	GRO-AK101 VOA Vials HCl	BTEX - SW8021B VOA Vials HCl						
9/27/2022	13:45	100972-UV22 1A-C	3	X	X						

Relinquished By:	Relinquished By:	Project Information
Signature:	Signature:	Project Number: 100972
Print Name: Zach Thon	Print Name:	Project Name: Zipmart
Company: Shannon & Wilson, Inc.	Company:	Contact: Randy Hessong, Zach Thon
Date: 9/28/22	Date:	Sampler: ZJT
Time: 9:16	Time:	Special Instructions:
Received By:	**Received By:**	**Sample Receipt**
Signature:	Signature: CJ	Shipped Via: Hand Delivered
Print Name:	Print Name: Chris Schimberg	
Company:	Company: SGS	Cooler Temperature Upon Arrival: 3.2 D62
Date:	Date: 9/28/22	Sample Matrix: Water
Time:	Time: 9:23	**10 Working DAY TAT**

e-Sample Receipt Form

SGS Workorder #:	1225911	1225911

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements	*Note:* Temperature and COC seal information is found on the chain of custody form	
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.	
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1225911001-A	HCL to pH < 2	OK			
1225911001-B	HCL to pH < 2	OK			
1225911001-C	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Suite 3
Anchorage, AK 99518

Report Number: **1226079**

Client Project: **100972 Zipmart**

Dear Zach Thon,

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: **Shannon & Wilson, Inc.**
SGS Project: **1226079**
Project Name/Site: **100972 Zipmart**
Project Contact: **Zach Thon**

Refer to sample receipt form for information on sample condition.

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

Print Date: 10/13/2022 3:22:58PM

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
100972-UV23	1226079001	10/04/2022	10/05/2022	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.

Print Date: 10/13/2022 3:23:01PM

Detectable Results Summary

Client Sample ID: **100972-UV23**
Lab Sample ID: 1226079001

Volatile Fuels

Parameter	Result	Units
Benzene	6560	ug/L
Ethylbenzene	1970	ug/L
Gasoline Range Organics	86.6	mg/L
o-Xylene	4530	ug/L
P & M -Xylene	10200	ug/L
Toluene	15900	ug/L
Xylenes (total)	14800	ug/L

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Results of **100972-UV23**

Client Sample ID: **100972-UV23**
Client Project ID: **100972 Zipmart**
Lab Sample ID: 1226079001
Lab Project ID: 1226079

Collection Date: 10/04/22 18:20
Received Date: 10/05/22 11:09
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	86.6		10.0	4.50	mg/L	100		10/12/22 18:45
Surrogates								
4-Bromofluorobenzene (surr)	103		50-150		%	100		10/12/22 18:45

Batch Information

Analytical Batch: VFC16286
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 10/12/22 18:45
Container ID: 1226079001-B

Prep Batch: VXX39316
Prep Method: SW5030B
Prep Date/Time: 10/12/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6560		50.0	15.0	ug/L	100		10/12/22 18:45
Ethylbenzene	1970		100	50.0	ug/L	100		10/12/22 18:45
o-Xylene	4530		100	50.0	ug/L	100		10/12/22 18:45
P & M -Xylene	10200		200	90.0	ug/L	100		10/12/22 18:45
Toluene	15900		100	50.0	ug/L	100		10/12/22 18:45
Xylenes (total)	14800		300	140	ug/L	100		10/12/22 18:45
Surrogates								
1,4-Difluorobenzene (surr)	94.9		77-115		%	100		10/12/22 18:45

Batch Information

Analytical Batch: VFC16286
Analytical Method: SW8021B
Analyst: PHK
Analytical Date/Time: 10/12/22 18:45
Container ID: 1226079001-B

Prep Batch: VXX39316
Prep Method: SW5030B
Prep Date/Time: 10/12/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1845951 [VXX/39316]
Blank Lab ID: 1691230

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226079001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	100	50-150		%

Batch Information

Analytical Batch: VFC16286
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 10/12/2022 12:14:00PM

Prep Batch: VXX39316
Prep Method: SW5030B
Prep Date/Time: 10/12/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
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Blank Spike Summary

Blank Spike ID: LCS for HBN 1226079 [VXX39316]
Blank Spike Lab ID: 1691233
Date Analyzed: 10/12/2022 13:10

Spike Duplicate ID: LCSD for HBN 1226079 [VXX39316]
Spike Duplicate Lab ID: 1691234
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226079001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.990	99	1.00	0.983	98	(60-120)	0.73	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		104	0.0500		100	(50-150)	4.00	

Batch Information

Analytical Batch: **VFC16286**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39316**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

SGS North America Inc.
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Method Blank

Blank ID: MB for HBN 1845951 [VXX/39316]
Blank Lab ID: 1691230

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226079001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	91	77-115		%

Batch Information

Analytical Batch: VFC16286
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 10/12/2022 12:14:00PM

Prep Batch: VXX39316
Prep Method: SW5030B
Prep Date/Time: 10/12/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1226079 [VXX39316]
Blank Spike Lab ID: 1691231
Date Analyzed: 10/12/2022 12:51

Spike Duplicate ID: LCSD for HBN 1226079 [VXX39316]
Spike Duplicate Lab ID: 1691232
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226079001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	104	104	100	108	108	(80-120)	3.60	(< 20)
Ethylbenzene	100	103	103	100	106	106	(75-125)	3.60	(< 20)
o-Xylene	100	102	102	100	107	107	(80-120)	4.20	(< 20)
P & M -Xylene	200	206	103	200	214	107	(75-130)	3.60	(< 20)
Toluene	100	102	102	100	107	107	(75-120)	4.20	(< 20)
Xylenes (total)	300	308	103	300	320	107	(79-121)	3.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		102	50		102	(77-115)	0.18	

Batch Information

Analytical Batch: **VFC16286**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **PHK**

Prep Batch: **VXX39316**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

SGS North America Inc.
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1226079

profile # 36753 DRBR

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

SGS North America Inc.

Date	Time	Sample ID	Total Containers	GRO-AK101	BTEX - SW8021B						
				VOA Vials HCl	VOA Vials HCl						
10/4/2022	18:20	100972-UV23	3	X	X						

Relinquished By:	Relinquished By:	Project Information
Signature:	Signature:	Project Number: 100972
Print Name: Zach Thon	Print Name:	Project Name: Zipmart
Company: Shannon & Wilson, Inc.	Company:	Contact: Randy Hessong, Zach Thon
Date: 10/5/22	Date:	Sampler: ZJT
Time: 11:08	Time:	Special Instructions:
Received By:	**Received By:**	**Sample Receipt**
Signature:	Signature: CSS	Shipped Via: Hand Delivered
Print Name:	Print Name: Chris Schinsing	
Company:	Company: SGS	Cooler Temperature Upon Arrival: 1.9 DSS
Date:	Date: 10/5/22	Sample Matrix: Water
Time:	Time: 11:09	**10 Working DAY TAT**

e-Sample Receipt Form

SGS Workorder #:	1226079	1226079

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements	*Note:* Temperature and COC seal information is found on the chain of custody form	
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.	
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies. ***Note:*** *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*	Yes	
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	No	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1226079001-A	No Preservative Required	OK			
1226079001-B	No Preservative Required	OK			
1226079001-C	No Preservative Required	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: Shannon & Wilson, Inc.
5430 Fairbanks St #3
Anchorage, AK 99518

Report Number: **1226457**

Client Project: **100972-001 Sterling Zip Mart**

Dear Alex Geilich,

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: **Shannon & Wilson, Inc.**
SGS Project: **1226457**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Alex Geilich**

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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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.

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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
100972-HT22	1226457001	10/19/2022	10/20/2022	Water (Surface, Eff., Ground)
100972-TWD22	1226457002	10/19/2022	10/20/2022	Water (Surface, Eff., Ground)

Method	Method Description
SW8021B	BTEX 8021
AK101	Gasoline Range Organics (W)
SW8260D	Volatile Organic Compounds (W)

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Detectable Results Summary

Client Sample ID: **100972-HT22**
Lab Sample ID: 1226457001

Volatile Fuels

Parameter	Result	Units
Benzene	664	ug/L
Ethylbenzene	55.5	ug/L
Gasoline Range Organics	4.38	mg/L
o-Xylene	619	ug/L
P & M -Xylene	274	ug/L
Toluene	810	ug/L
Xylenes (total)	893	ug/L

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Results of **100972-HT22**

Client Sample ID: **100972-HT22**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1226457001
Lab Project ID: 1226457

Collection Date: 10/19/22 17:00
Received Date: 10/20/22 16:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	4.38		0.500	0.225	mg/L	5		10/27/22 21:03
Surrogates								
4-Bromofluorobenzene (surr)	82.4		50-150		%	5		10/27/22 21:03

Batch Information

Analytical Batch: VFC16313
Analytical Method: AK101
Analyst: JY
Analytical Date/Time: 10/27/22 21:03
Container ID: 1226457001-B

Prep Batch: VXX39401
Prep Method: SW5030B
Prep Date/Time: 10/27/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	664		2.50	0.750	ug/L	5		10/27/22 21:03
Ethylbenzene	55.5		5.00	2.50	ug/L	5		10/27/22 21:03
o-Xylene	619		5.00	2.50	ug/L	5		10/27/22 21:03
P & M -Xylene	274		10.0	4.50	ug/L	5		10/27/22 21:03
Toluene	810		5.00	2.50	ug/L	5		10/27/22 21:03
Xylenes (total)	893		15.0	7.00	ug/L	5		10/27/22 21:03
Surrogates								
1,4-Difluorobenzene (surr)	101		77-115		%	5		10/27/22 21:03

Batch Information

Analytical Batch: VFC16313
Analytical Method: SW8021B
Analyst: JY
Analytical Date/Time: 10/27/22 21:03
Container ID: 1226457001-B

Prep Batch: VXX39401
Prep Method: SW5030B
Prep Date/Time: 10/27/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/08/2022 12:15:27PM

J flagging is activated

Results of **100972-TWD22**

Client Sample ID: **100972-TWD22**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1226457002
Lab Project ID: 1226457

Collection Date: 10/19/22 18:36
Received Date: 10/20/22 16:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0450	mg/L	1		10/25/22 20:04
Surrogates								
4-Bromofluorobenzene (surr)	82.1		50-150		%	1		10/25/22 20:04

Batch Information

Analytical Batch: VFC16311
Analytical Method: AK101
Analyst: JY
Analytical Date/Time: 10/25/22 20:04
Container ID: 1226457002-A

Prep Batch: VXX39393
Prep Method: SW5030B
Prep Date/Time: 10/25/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100972-TWD22**

Client Sample ID: **100972-TWD22**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1226457002
Lab Project ID: 1226457

Collection Date: 10/19/22 18:36
Received Date: 10/20/22 16:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		10/28/22 19:27
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/28/22 19:27
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/28/22 19:27
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/28/22 19:27
Toluene	0.500	U	1.00	0.310	ug/L	1		10/28/22 19:27
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/28/22 19:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		10/28/22 19:27
4-Bromofluorobenzene (surr)	103		85-114		%	1		10/28/22 19:27
Toluene-d8 (surr)	100		89-112		%	1		10/28/22 19:27

Batch Information

Analytical Batch: VMS22117
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 10/28/22 19:27
Container ID: 1226457002-B

Prep Batch: VXX39422
Prep Method: SW5030B
Prep Date/Time: 10/28/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/08/2022 12:15:27PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1847279 [VXX/39393]
Blank Lab ID: 1693732

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226457002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	88.5	77-115		%
4-Bromofluorobenzene (surr)	81.9	50-150		%

Batch Information

Analytical Batch: VFC16311
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: JY
Analytical Date/Time: 10/25/2022 12:32:00PM

Prep Batch: VXX39393
Prep Method: SW5030B
Prep Date/Time: 10/25/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/08/2022 12:15:28PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1226457 [VXX39393]
Blank Spike Lab ID: 1693735
Date Analyzed: 10/25/2022 13:27

Spike Duplicate ID: LCSD for HBN 1226457 [VXX39393]
Spike Duplicate Lab ID: 1693736
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226457002

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.927	93	1.00	0.940	94	(60-120)	1.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		89	0.0500		88	(50-150)	1.10	

Batch Information

Analytical Batch: **VFC16311**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **JY**

Prep Batch: **VXX39393**
Prep Method: **SW5030B**
Prep Date/Time: **10/25/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1847368 [VXX/39401]
Blank Lab ID: 1694202

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226457001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.000250U	0.000500	0.000150	mg/L
Ethylbenzene	0.000500U	0.00100	0.000500	mg/L
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
o-Xylene	0.000500U	0.00100	0.000500	mg/L
P & M -Xylene	0.00100U	0.00200	0.000900	mg/L
Toluene	0.000500U	0.00100	0.000500	mg/L
Xylenes (total)	0.00150U	0.00300	0.00140	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	88.7	77-115		%
4-Bromofluorobenzene (surr)	78.9	50-150		%

Batch Information

Analytical Batch: VFC16313
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: JY
Analytical Date/Time: 10/27/2022 1:04:00PM

Prep Batch: VXX39401
Prep Method: SW5030B
Prep Date/Time: 10/27/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/08/2022 12:15:32PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1226457 [VXX39401]
Blank Spike Lab ID: 1694203
Date Analyzed: 10/27/2022 13:41

Spike Duplicate ID: LCSD for HBN 1226457 [VXX39401]
Spike Duplicate Lab ID: 1694204
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226457001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.100	0.100	100	0.100	0.109	109	(80-120)	8.30	(< 20)
Ethylbenzene	0.100	0.101	101	0.100	0.109	109	(75-125)	7.50	(< 20)
o-Xylene	0.100	0.0988	99	0.100	0.105	105	(80-120)	5.80	(< 20)
P & M -Xylene	0.200	0.201	100	0.200	0.216	108	(75-130)	7.20	(< 20)
Toluene	0.100	0.103	103	0.100	0.112	112	(75-120)	8.30	(< 20)
Xylenes (total)	0.300	0.300	100	0.300	0.321	107	(79-121)	6.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	0.0500		99	0.0500		99	(77-115)	0.52	

Batch Information

Analytical Batch: **VFC16313**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **JY**

Prep Batch: **VXX39401**
Prep Method: **SW5030B**
Prep Date/Time: **10/27/2022 06:00**
Spike Init Wt./Vol.: 0.100 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.100 mg/L Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1226457 [VXX39401]
Blank Spike Lab ID: 1694205
Date Analyzed: 10/27/2022 14:00

Spike Duplicate ID: LCSD for HBN 1226457 [VXX39401]
Spike Duplicate Lab ID: 1694206
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226457001

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.870	87	1.00	0.898	90	(60-120)	3.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		87	0.0500		85	(50-150)	2.50	

Batch Information

Analytical Batch: **VFC16313**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **JY**

Prep Batch: **VXX39401**
Prep Method: **SW5030B**
Prep Date/Time: **10/27/2022 06:00**
Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1847368 [VXX/39401]
Blank Lab ID: 1694202

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226457001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.500	ug/L
o-Xylene	0.500U	1.00	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.900	ug/L
Toluene	0.500U	1.00	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.40	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	88.7	77-115		%

Batch Information

Analytical Batch: VFC16313
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: JY
Analytical Date/Time: 10/27/2022 1:04:00PM

Prep Batch: VXX39401
Prep Method: SW5030B
Prep Date/Time: 10/27/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/08/2022 12:15:37PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1226457 [VXX39401]
Blank Spike Lab ID: 1694203
Date Analyzed: 10/27/2022 13:41

Spike Duplicate ID: LCSD for HBN 1226457 [VXX39401]
Spike Duplicate Lab ID: 1694204
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226457001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	100	100	100	109	109	(80-120)	8.30	(< 20)
Ethylbenzene	100	101	101	100	109	109	(75-125)	7.50	(< 20)
o-Xylene	100	98.8	99	100	105	105	(80-120)	5.80	(< 20)
P & M -Xylene	200	201	100	200	216	108	(75-130)	7.20	(< 20)
Toluene	100	103	103	100	112	112	(75-120)	8.30	(< 20)
Xylenes (total)	300	300	100	300	321	107	(79-121)	6.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50		99	50		99	(77-115)	0.52	

Batch Information

Analytical Batch: **VFC16313**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **JY**

Prep Batch: **VXX39401**
Prep Method: **SW5030B**
Prep Date/Time: **10/27/2022 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1847638 [VXX/39422]
Blank Lab ID: 1695417

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1226457002

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	106	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS22117
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: AZL
Analytical Date/Time: 10/28/2022 11:51:00AM

Prep Batch: VXX39422
Prep Method: SW5030B
Prep Date/Time: 10/28/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1226457 [VXX39422]
Blank Spike Lab ID: 1695418
Date Analyzed: 10/28/2022 12:07

Spike Duplicate ID: LCSD for HBN 1226457 [VXX39422]
Spike Duplicate Lab ID: 1695419
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1226457002

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	30.6	102	30	29.7	99	(79-120)	2.80	(< 20)
Ethylbenzene	30	30.6	102	30	29.9	100	(79-121)	2.10	(< 20)
o-Xylene	30	30.6	102	30	30.2	101	(78-122)	1.20	(< 20)
P & M -Xylene	60	61.7	103	60	60.4	101	(80-121)	2.10	(< 20)
Toluene	30	29.5	98	30	28.7	96	(80-121)	2.70	(< 20)
Xylenes (total)	90	92.2	102	90	90.6	101	(79-121)	1.80	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		97	30		97	(81-118)	0.59	
4-Bromofluorobenzene (surr)	30		100	30		101	(85-114)	0.56	
Toluene-d8 (surr)	30		100	30		98	(89-112)	1.10	

Batch Information

Analytical Batch: **VMS22117**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **AZL**

Prep Batch: **VXX39422**
Prep Method: **SW5030B**
Prep Date/Time: **10/28/2022 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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1226457

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CHAIN-OF-CUSTODY RECORD

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Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX AK 101/SW 8021B 2 X 40 ml w/ HCL					Total Number of Containers	Remarks/Matrix
100972-HT22	1AB	17:00	10/19/22		X	X					2	Likely medium conc. water
100972-TWD22	2AB	18:36	10/19/22		X	X					2	Likely low concentration water

Project Information	Sample Receipt
Project Number: 100972-001	Total Number of Containers
Project Name: Sterling ZipMart	COC Seals/Intact? Y/N/NA
Contact: Alex Geilich	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: Randy Hessong	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: Standard
Special Instructions: S&W/SGS MSA - No trip blank - Only 2 VOAs per sample

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 16:53	Signature: Time:	Signature: Time:
Printed Name: Randy Hessong Date: 10/20/22	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 10:35
Printed Name: Date:	Printed Name: Date:	Printed Name: Daniel Fennessy Date: 10/20/22
Company:	Company:	Company: SGS 3.0055

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 18 320 35132

e-Sample Receipt Form

SGS Workorder #:	1226457	1226457

Review Criteria	Condition (Yes, No, N/A	Exceptions Noted below
Chain of Custody / Temperature Requirements	*Note:* Temperature and COC seal information is found on the chain of custody form	
DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any 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 and sample containers.	
Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	
Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
Were all soil VOAs received with a corresponding % solids container?	N/A	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	No	Trip Blank not requested by client
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with Methanol+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
1226457001-A	HCL to pH < 2	OK			
1226457001-B	HCL to pH < 2	OK			
1226457002-A	HCL to pH < 2	OK			
1226457002-B	HCL to pH < 2	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: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste. 3
Anchorage, AK 99518
(907)433-3215

Report Number: **1217377**

Client Project: **100972-001 Sterling Zip Mart**

Dear Randy Hessong,

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
2021.12.07
16:24:06 -09'00'

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: **Shannon & Wilson, Inc.**
SGS Project: **1217377**
Project Name/Site: **100972-001 Sterling Zip Mart**
Project Contact: **Randy Hessong**

Refer to sample receipt form for information on sample condition.

100972-GAC21 (1217377001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

*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
100972-GAC21	1217377001	11/06/2021	11/08/2021	Soil/Solid (dry weight)
100972-GAC21	1217377002	11/06/2021	11/08/2021	Solid/Soil (Wet Weight)

Method	Method Description
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
SM21 2540G	Percent Solids SM2540G
SW8260D TCLP	TCLP Volatile Organic Compounds 8260

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Detectable Results Summary

Client Sample ID: **100972-GAC21**
Lab Sample ID: 1217377001
Volatile Fuels

Parameter	Result	Units
Benzene	345	ug/kg
Ethylbenzene	35.2J	ug/kg
Gasoline Range Organics	5.93J	mg/kg
o-Xylene	140	ug/kg
P & M -Xylene	154J	ug/kg
Toluene	408	ug/kg
Xylenes (total)	294	ug/kg

Client Sample ID: **100972-GAC21**
Lab Sample ID: 1217377002
TCLP Volatiles GC/MS

Parameter	Result	Units
Benzene	0.0225	mg/L

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Results of **100972-GAC21**

Client Sample ID: **100972-GAC21**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1217377001
Lab Project ID: 1217377

Collection Date: 11/06/21 17:38
Received Date: 11/08/21 13:58
Matrix: Soil/Solid (dry weight)
Solids (%):55.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	5.93	J	9.02	2.71	mg/kg	1		11/10/21 14:18
Surrogates								
4-Bromofluorobenzene (surr)	.54	*	50-150		%	1		11/10/21 14:18

Batch Information

Analytical Batch: VFC15939
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 11/10/21 14:18
Container ID: 1217377001-B

Prep Batch: VXX38164
Prep Method: SW5035A
Prep Date/Time: 11/06/21 17:38
Prep Initial Wt./Vol.: 44.882 g
Prep Extract Vol: 44.9552 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	345		45.1	14.4	ug/kg	1		11/10/21 14:18
Ethylbenzene	35.2	J	90.2	32.5	ug/kg	1		11/10/21 14:18
o-Xylene	140		90.2	32.8	ug/kg	1		11/10/21 14:18
P & M -Xylene	154	J	180	54.1	ug/kg	1		11/10/21 14:18
Toluene	408		90.2	28.1	ug/kg	1		11/10/21 14:18
Xylenes (total)	294		271	90.2	ug/kg	1		11/10/21 14:18
Surrogates								
1,4-Difluorobenzene (surr)	95		72-119		%	1		11/10/21 14:18

Batch Information

Analytical Batch: VFC15939
Analytical Method: SW8021B
Analyst: IJV
Analytical Date/Time: 11/10/21 14:18
Container ID: 1217377001-B

Prep Batch: VXX38164
Prep Method: SW5035A
Prep Date/Time: 11/06/21 17:38
Prep Initial Wt./Vol.: 44.882 g
Prep Extract Vol: 44.9552 mL

Print Date: 12/07/2021 11:52:32AM

J flagging is activated

Results of **100972-GAC21**

Client Sample ID: **100972-GAC21**
Client Project ID: **100972-001 Sterling Zip Mart**
Lab Sample ID: 1217377002
Lab Project ID: 1217377

Collection Date: 11/06/21 17:38
Received Date: 11/08/21 13:58
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Volatiles GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0225		0.0200	0.00600	mg/L	50	(<0.5)	11/12/21 18:08
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	50		11/12/21 18:08
4-Bromofluorobenzene (surr)	101		85-114		%	50		11/12/21 18:08
Toluene-d8 (surr)	99.3		89-112		%	50		11/12/21 18:08

Batch Information

Analytical Batch: VMS21373
Analytical Method: SW8260D TCLP
Analyst: MDT
Analytical Date/Time: 11/12/21 18:08
Container ID: 1217377002-A

Prep Batch: VXX38174
Prep Method: SW5030B
Prep Date/Time: 11/12/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1828338 [SPT/11431]
Blank Lab ID: 1646698

Matrix: Soil/Solid (dry weight)

QC for Samples:
1217377001

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11431
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 11/9/2021 5:00:00PM

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Duplicate Sample Summary

Original Sample ID: 1217376001
Duplicate Sample ID: 1646699
QC for Samples:
1217377001

Analysis Date: 11/09/2021 17:00
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.7	94.4	%	0.70	(< 15)

Batch Information

Analytical Batch: SPT11431
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 12/07/2021 11:52:36AM

Method Blank

Blank ID: MB for HBN 1828382 [VXX/38164]
Blank Lab ID: 1646849

Matrix: Soil/Solid (dry weight)

QC for Samples:
1217377001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.835J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	83.7	50-150		%

Batch Information

Analytical Batch: VFC15939
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 11/10/2021 12:36:00PM

Prep Batch: VXX38164
Prep Method: SW5035A
Prep Date/Time: 11/10/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1217377 [VXX38164]
Blank Spike Lab ID: 1646852
Date Analyzed: 11/10/2021 12:00

Spike Duplicate ID: LCSD for HBN 1217377 [VXX38164]
Spike Duplicate Lab ID: 1646853
Matrix: Soil/Solid (dry weight)

QC for Samples: 1217377001

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.8	111	12.5	13.0	104	(60-120)	6.10	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		94	1.25		90	(50-150)	4.70	

Batch Information

Analytical Batch: **VFC15939**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38164**
Prep Method: **SW5035A**
Prep Date/Time: **11/10/2021 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1828382 [VXX/38164]
Blank Lab ID: 1646849

Matrix: Soil/Solid (dry weight)

QC for Samples:
1217377001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/kg
Ethylbenzene	12.5U	25.0	9.00	ug/kg
o-Xylene	12.5U	25.0	9.10	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	25.0	ug/kg
Surrogates				
1,4-Difluorobenzene (surr)	98	72-119		%

Batch Information

Analytical Batch: VFC15939
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 11/10/2021 12:36:00PM

Prep Batch: VXX38164
Prep Method: SW5035A
Prep Date/Time: 11/10/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1217377 [VXX38164]
Blank Spike Lab ID: 1646850
Date Analyzed: 11/10/2021 11:25

Spike Duplicate ID: LCSD for HBN 1217377 [VXX38164]
Spike Duplicate Lab ID: 1646851
Matrix: Soil/Solid (dry weight)

QC for Samples: 1217377001

Results by **SW8021B**

	Blank Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1330	107	1250	1430	114	(75-125)	6.90	(< 20)
Ethylbenzene	1250	1280	102	1250	1300	104	(75-125)	1.70	(< 20)
o-Xylene	1250	1210	97	1250	1250	100	(75-125)	3.30	(< 20)
P & M -Xylene	2500	2550	102	2500	2580	103	(80-125)	1.40	(< 20)
Toluene	1250	1270	102	1250	1330	107	(70-125)	4.70	(< 20)
Xylenes (total)	3750	3750	100	3750	3830	102	(78-124)	2.00	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250		96	1250		100	(72-119)	4.80	

Batch Information

Analytical Batch: **VFC15939**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **IJV**

Prep Batch: **VXX38164**
Prep Method: **SW5035A**
Prep Date/Time: **11/10/2021 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1646854
MS Sample ID: 1646855 MS
MSD Sample ID: 1646856 MSD

QC for Samples: 1217377001

Analysis Date: 11/10/2021 14:18
Analysis Date: 11/10/2021 14:35
Analysis Date: 11/10/2021 14:53
Matrix: Soil/Solid (dry weight)

Results by **SW8021B**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	107	1390	1760	119	1390	1730	117	75-125	1.50	(< 20)
Ethylbenzene	10.9J	1390	1560	111	1390	1560	111	75-125	0.05	(< 20)
o-Xylene	43.2	1390	1550	108	1390	1550	109	75-125	0.11	(< 20)
P & M -Xylene	47.6J	2790	3120	110	2790	3120	110	80-125	0.22	(< 20)
Toluene	126	1390	1730	115	1390	1710	114	70-125	1.10	(< 20)
Xylenes (total)	90.8	4180	4670	110	4180	4680	110	78-124	0.18	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		1390	1390	100	1390	1390	100	72-119	0.06	

Batch Information

Analytical Batch: VFC15939
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 11/10/2021 2:35:00PM

Prep Batch: VXX38164
Prep Method: AK101 Extraction (S)
Prep Date/Time: 11/10/2021 6:00:00AM
Prep Initial Wt./Vol.: 44.88g
Prep Extract Vol: 25.00mL

Print Date: 12/07/2021 11:52:49AM

Method Blank

Blank ID: MB for HBN 1828547 [VXX/38174]
Blank Lab ID: 1647265

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1217377002

Results by **SW8260D TCLP**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.000200U	0.000400	0.000120	mg/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	98.7	85-114		%
Toluene-d8 (surr)	99.4	89-112		%

Batch Information

Analytical Batch: VMS21373
Analytical Method: SW8260D TCLP
Instrument: VPA 780/5975 GC/MS
Analyst: MDT
Analytical Date/Time: 11/12/2021 10:53:00AM

Prep Batch: VXX38174
Prep Method: SW5030B
Prep Date/Time: 11/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Leaching Blank

Blank ID: LB for HBN 1828416 [TCLP/11502
Blank Lab ID: 1646981

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1217377002

Results by **SW8260D TCLP**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.0100U	0.0200	0.00600	mg/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	99.1	81-118		%
4-Bromofluorobenzene (surr)	101	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS21373
Analytical Method: SW8260D TCLP
Instrument: VPA 780/5975 GC/MS
Analyst: MDT
Analytical Date/Time: 11/12/2021 1:45:00PM

Prep Batch: VXX38174
Prep Method: SW5030B
Prep Date/Time: 11/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Leaching Blank

Blank ID: LB for HBN 1828417 [TCLP/11503
Blank Lab ID: 1646982

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1217377002

Results by **SW8260D TCLP**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.0100U	0.0200	0.00600	mg/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	99.4	85-114		%
Toluene-d8 (surr)	99.2	89-112		%

Batch Information

Analytical Batch: VMS21373
Analytical Method: SW8260D TCLP
Instrument: VPA 780/5975 GC/MS
Analyst: MDT
Analytical Date/Time: 11/12/2021 2:00:00PM

Prep Batch: VXX38174
Prep Method: SW5030B
Prep Date/Time: 11/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1217377 [VXX38174]
Blank Spike Lab ID: 1647266
Date Analyzed: 11/12/2021 11:08

Spike Duplicate ID: LCSD for HBN 1217377 [VXX38174]
Spike Duplicate Lab ID: 1647267
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1217377002

Results by **SW8260D TCLP**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.0300	0.0281	94	0.0300	0.0272	91	(79-120)	3.30	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	0.0300		98	0.0300		97	(81-118)	0.82	
4-Bromofluorobenzene (surr)	0.0300		101	0.0300		102	(85-114)	1.20	
Toluene-d8 (surr)	0.0300		100	0.0300		100	(89-112)	0.70	

Batch Information

Analytical Batch: **VMS21373**
Analytical Method: **SW8260D TCLP**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **MDT**

Prep Batch: **VXX38174**
Prep Method: **SW5030B**
Prep Date/Time: **11/12/2021 06:00**
Spike Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1217377

P# 334871 SL

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

Page ____ of ____

Section 1

CLIENT: Shannon + Wilson, Inc.

CONTACT: Randy Hessong — PHONE #: 907-433-3215

PROJECT NAME: Sterling Zip Mart — PROJECT/PWSID/PERMIT#: 100972-001

REPORTS TO: randy.hessong@shanwil.com — E-MAIL: Profile #:

INVOICE TO: AP-Anchorage — QUOTE #: Open — P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp / Grab / MI (Multi-incremental)	Preservative: MeOH	Preservative: 4°C	Analysis*: GRO/BTEX AK101/8021B 1x40ml 25ml MeOH	Analysis*: TCLP Benzene SW1311/8260 1 8oz Solids	Analysis*	Analysis*	Analysis*	Analysis*	Analysis*	Analysis*	REMARKS/LOC ID
(1AB)	100972-GAC21	11/06/21	17:38	Activated Carbon		Field Composite	X	X									

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

Section 5

	Date	Time	
Relinquished By: (1)	11/8/21	13:58	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	11/8/21	15:58	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Data Deliverable Requirements: Std.

Cooler ID: 1

Requested Turnaround Time and/or Special Instructions:
5tw/SGS MSA
No Trip Blank

Temp Blank °C: 2.7 DS1 or Ambient [ ]

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

Delivery Method: Hand Delivery [X] Commerical Delivery [ ]

SGS North America Inc.
200 W. Potter Drive, Anchorage, AK 99518
phone (907) 562-2343, fax (907) 561-5301

Characterization of TCLP Samples for LIMS Login

Date Characterized: 11/8/21 **Analyst:** RJC

Sample Container ID:	Matrix	%	Is sufficient volume/mass available?	Notes:
100972 -GAC21	Xylene miscible (Top layer * = matrix 3 **)	—	(Yes) / No	If multiple jars were received, were they consistent? (Yes) / No / NA If biphasic, was there **only** one layer with sufficient sample ? Yes / No / (NA) Sample description/other observations: Activated Carbon **Are samples Glycol or Solvent in appearance or odor? If yes schedule TCLP Metals matrix 6 acode.
	Water miscible (Middle layer = matrix 6)	—		
	Solid (Bottom layer = matrix 7 or 2 if % solids required)	100		
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA If biphasic, was there **only** one layer with sufficient sample ? Yes / No / NA Sample description/other observations: **Are samples Glycol or Solvent in appearance or odor? If yes schedule TCLP Metals matrix 6 acode.
	Water miscible (Middle layer = matrix 6)			
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA If biphasic, was there **only** one layer with sufficient sample ? Yes / No / NA Sample description/other observations: **Are samples Glycol or Solvent in appearance or odor? If yes schedule TCLP Metals matrix 6 acode.
	Water miscible (Middle layer = matrix 6)			
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA If biphasic, was there **only** one layer with sufficient sample ? Yes / No / NA Sample description/other observations: **Are samples Glycol or Solvent in appearance or odor? If yes schedule TCLP Metals matrix 6 acode.
	Water miscible (Middle layer = matrix 6)			
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA If biphasic, was there **only** one layer with sufficient sample ? Yes / No / NA Sample description/other observations: **Are samples Glycol or Solvent in appearance or odor? If yes schedule TCLP Metals matrix 6 acode.
	Water miscible (Middle layer = matrix 6)			
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			

Remember: **** = Chlorinated oils will be heavier than water and present as the bottom later.***
***** = Oils must be filterable to be logged in as matrix 3. Nonfilterable oils must be logged in as matrix 7.***
****** = Refer to F078 'Characterization of TCLP Samples for LIMS' to determine if there's sufficent volume/mass.***

e-Sample Receipt Form

SGS Workorder #:	1217377	1217377

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	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 @ 2.7 °C Therm. ID: D52
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?	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?	No	**No trip blank was received with samples**
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

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
1217377001-A	No Preservative Required	OK			
1217377001-B	Methanol field pres. 4 C	OK			
1217377002-A	No Preservative Required	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 C

RESULTS OF ANALYTICAL TESTING BY

EUROFINS AIR TOXICS, LLC

eurofins | Air Toxics

11/24/2021
Mr. Randy Hessong
Shannon & Wilson, Inc.
5430 Fairbanks Street
Suite 3
Anchorage AK 99518

Project Name: Sterling Zip Mart
Project #: 100972-001
Workorder #: 2111302

Dear Mr. Randy Hessong

The following report includes the data for the above referenced project for sample(s) received on 11/11/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Monica Tran at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Monica Tran

Project Manager

eurofins | Air Toxics

WORK ORDER #: 2111302

Work Order Summary

CLIENT:	Mr. Randy Hessong Shannon & Wilson, Inc. 5430 Fairbanks Street Suite 3 Anchorage, AK 99518	**BILL TO:**	Mr. Randy Hessong Shannon & Wilson, Inc. 5430 Fairbanks Street Suite 3 Anchorage, AK 99518
PHONE:	907-561-2120	**P.O. #**	
FAX:	907-561-4483	**PROJECT #**	100972-001 Sterling Zip Mart
DATE RECEIVED:	11/11/2021	**CONTACT:**	Monica Tran
DATE COMPLETED:	11/24/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	100972-VEZ41	TO-15	2.6 "Hg	9.9 psi
02A	Lab Blank	TO-15	NA	NA
03A	CCV	TO-15	NA	NA
04A	LCS	TO-15	NA	NA
04AA	LCSD	TO-15	NA	NA

CERTIFIED BY:  DATE: 11/24/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209221, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-21-17, UT NELAP – CA009332021-13, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-015, Effective date: 10/18/2021, Expiration date: 10/17/2022.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Shannon & Wilson, Inc.
Workorder# 2111302

One 1 Liter Summa Canister sample was received on November 11, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

The Chain of Custody (COC) information for sample 100972-VEZ41 did not match the entry on the sample tag with regard to sample identification. The information on the sample tag was used to process and report the sample.

Analytical Notes

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Dilution was performed on sample 100972-VEZ41 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 100972-VEZ41

Lab ID#: 2111302-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	3.7	810	12	2600
Toluene	3.7	670	14	2500
Ethyl Benzene	3.7	19	16	84
m,p-Xylene	3.7	210	16	910
o-Xylene	3.7	86	16	370
TPH ref. to Gasoline (MW=100)	370	5500	1500	22000

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Client Sample ID: 100972-VEZ41

Lab ID#: 2111302-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3112215**	**Date of Collection: 11/6/21 8:15:00 PM**	
Dil. Factor:	**7.33**	**Date of Analysis: 11/22/21 07:33 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	3.7	810	12	2600
Toluene	3.7	670	14	2500
Ethyl Benzene	3.7	19	16	84
m,p-Xylene	3.7	210	16	910
o-Xylene	3.7	86	16	370
TPH ref. to Gasoline (MW=100)	370	5500	1500	22000

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2111302-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3112207c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/22/21 01:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.50	Not Detected	1.6	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
TPH ref. to Gasoline (MW=100)	50	Not Detected	200	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 2111302-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3112203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/22/21 10:39 AM**	

Compound	%Recovery
Benzene	94
Toluene	101
Ethyl Benzene	100
m,p-Xylene	102
o-Xylene	101
TPH ref. to Gasoline (MW=100)	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	89	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: LCS

Lab ID#: 2111302-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3112204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/22/21 11:07 AM**	

Compound	%Recovery	Method Limits
Benzene	94	70-130
Toluene	99	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	104	70-130
o-Xylene	100	70-130
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCSD

Lab ID#: 2111302-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3112205**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/22/21 11:34 AM**	

Compound	%Recovery	Method Limits
Benzene	94	70-130
Toluene	100	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	104	70-130
o-Xylene	100	70-130
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	89	70-130
4-Bromofluorobenzene	105	70-130

APPENDIX D

FIELD NOTES

100972 | 9/9/2021 | NTZ

15:54 On Site. Overcast, NE wind, ~60°F

Pump & Treat holding tank is full. Get vapor instruments charging.
Set up to drain tank.
DTW UST Vent: 8.54' @16:40, top of pump = 10.40
DTW Holding tank: 1.33' (top of rim)

Sample 100972-HT12 16:52; water in holding tank from N. end with dedicated poly bailer - 3 x 40 mL VOA w/HCl - G-ROB572Y

Setup filters @ GAC (50 psi used once), discharge to MW-4.
Start pump @ 1805. GAC drum bled, outlet open @1815

Flow rate is just shy of 3 gal./minute.

N.AIS 6 @ 9760.8 hours, Even - 9.9 psi Odd 11.7 psi

Well	CFM flow	psi		Well	CFM flow	psi	
ASW 2	2.9	4.5		ASW 1	1.9	3.8	
4	2.5	7.7		3	1.4	6.9	
6	1.8	7.5		5	2.2	7.1	
RW 2	1.7	4.6		bubbler 7	1.4	5.1	
bubbler 8	1.1	5.5		RW 1	1.9	4.1	

blow out condensation from air bubbler line

- Close down bubbler lines & reconnect to ASW 7 + ASW 8
- Re adjust flows.

Odd - 10.1 psi

ASW 1	1.9 CFM	3.6 psi
3	2.4	7.1
5	2.4	7.2
7	1.2	7.7
RW 1	2.0	4.2

ASW 7 slow to break through, 6 a little slow too.
Repeat

ASW 1	1.9	4.15
3	2.5	7.15
5	2.5	7.1
7	1.2	7.85
RW 1	2.0	4.1

Even - 9.6 psi

ASW 2	2.0 CFM	4.5 psi
4	2.2	7.7
6	2.3	7.7
RW 2	1.9	4.6
ASW 8	2.0	6.5

4 drops off, 6 climbs

ASW 2	1.9	4.5
4	2.4	7.5
6	2.5	7.5
RW 2	1.9	4.6
ASW 8	1.9	6.4

100972 9/9/21 RTW

Calibrate vapor instruments.

Blower 2

CFM	VAC	PID	PID	LEL	O_2
105	28	9 slow ppm	6.6 ppm	0%	19.7%
Temp	84°F				

K.O. drg. 20:25

RW1		RW2	
CFM	65	CFM	43
LEL	0%	LEL	0%
O_2	19.3%	O_2	20.0%
PID	7.4 ppm	PID	1.9 ppm
Temp	51F	Temp	49 F

Sample 100972-TW012, 2033; Water from P&T after filters & GAC treatment, at MW4. 3x40mL VOA w/HCl - GROUNDTEK

S. AIS hours: 59235.9 total psi: 8.9

Well	CFM flow	psi	
RW9	3.2	5.4	
RW15	3.3	6.0	
RW3	3.0	7.1	
RW12	3.5	5.6	

Timer not working - continuous operation. Battery DC @ 9.46 volts
No buttons work. Open up - no obvious fried components. Maybe shorted w/ blower timer? - sold. Take instructions to Anchorage. Leave system running

E. AIS Both blowers running. Both outlet filter cans leaking - tightening helps, but does not cure. Need new cans.
8.5 psi @ 21:35 Sounds funny.
- Turn heat trace on.

ASW10 wet, 2.2 GPM. Drain main line
ASW11 also wet ≈ 1 CFM
ASW12 just foggy
ASW21 Not rattling - also wet.
Remainder are rattling. ASW 23 @ 1.2 CFM
Needs draining & cleaning

22500 off site.

100972 [9/14/21] RTW

15:45 On site. Wx: Mostly cloudy, variable SW wind, 5-20 kt.
P&T holding tank is empty. Need to fill. (GFCI popped @ MAIS)
DTW, UST vent: 8.34' BTOC @ 16:10 Start Abyss pump @ 16:12
Pumping rate: ≈ 20 oz in 30 sec. ≈ 0.31 gallons/min.

Clean up 50µm filters & housings - store hose & fittings in shed.

100972 9/14/21 2727

N. AIS	odd total psi: 10.0	hours: 8979.1		Evg: 9.5 psi			
Well	CFM flow	psi		Well	CFM flow	psi	
ASW1	1.8 → 1.9	3.5		ASW2	1.9	4.5	
3	2.4 2.5	7.0		4	2.4	7.6	
5	2.2 → 2.3	7.2	11:05	6	2.3	7.0	20:32
7	1.3 1.4	7.8		RW2	2	4.5	
RW1	2.0 → 2.0	4.1		ASW8	1.8 →	6.4	
	↑ After tapping						

Blower 2 105 CFM, 28" Vac. RW1 = 62 cfm RW2 = 49 CFM. 17507

S. AIS	hours: 5935.1	total psi: 8.7	
Well	CFM flow	psi	
RW9	3.2	5.4	
15	3.3	6.0	10:00
3	3.0	6.9	20:00
12	3.4	5.5	

Take Intermatic timer out of SVE Blower 1 + adapt to use in S. AIS. Battery has corroded + connections are bad - clean + + wrap - works O.K.

problem: Time + switch is totally dependent on battery. Will turn off blower if battery goes out. Not much room in box for a junction of many wires.

20:00 - timer is programmed + seems to work.

E. AIS: Book Hours reading, 8.1 - 62 psi

Heat trace appears to have dried out ASW10 + 11 - adjust to 1.9 CFM

ASW12 @ 1.8 cfm, ASW9 @ 1.4 cfm, ASW16 @ 1.1 cfm, ASW19 @ 1.3 cfm. Flow at not readily readable at 1 cfm.

ASW 23 @ 1.1 cfm. I think Compressor 1 is weak + low volume

Take corroded batteries out of Blower 2 timer.

21:20 Off S/Tc.

100972 9/19/21 2727

19:06 On S/Tc. (Intermatic timer failed, Tork started working)

Wire Tork timer back into S. AIS - 4 hour intermittent time. Put running intermittently = drawn down

20:06 Off S/Tc.

100972 9/20/21 RAW

13:24 Depart Hoonah.
15:00 On Site. Wx: overcast, occasional showers
Set up to clean E. AIS flowmeters

well	CFM	psi	
ASW23	1.7	5.4	cleaned not valve
22	can't read-too high	6.4	cleaned w/ valve
21	Picture Read		
20	"		
19	1.4	6.3	Laundry-strip
18	1.5+	5.6	" "
17	1.5-	5.1	readable, strong
16	?	5.3	Not readable - cleaned w/valve - only got down to 2.0
15	1.7+	6.4	Just readable
14	1.8-	7.6	Cloudy but readable
13	1.4	5.4	Not very readable. Need clean
12	1.8-	6.5	Just barely readable
11	2.1+	4.9	Cloudy but readable
10	1.1?	7.6	Wet -

18:24

Try putting 2nd gasket on E.AIS outlet filters - fails.
Try wrapping glass canisters w/ gorilla tape + installing.
- Looks ok good. No failure @ 8.6 psi.

- Replace E.AIS outlet filters. 18:56 Run on N. Isk to reconfigure

~~well CFM psi~~

ASW10 Try to adjust all wells to 2 CFM - all settle into 1.7 to 1.8 CFM range except ASW10 - not flowing

well	CFM	psi	well	CFM	psi
ASW10	0	7.2	ASW17	1.8-	5.4
11	1.8-	4.6	16	1.8	5.6
12	(Can't record 1.7-1.8)		19	1.7	6.2
13			20	1.7+	4.5
14	1.8	7.9	21	1.8-	4.8
15	1.8	6.4	22	1.7+	6.4
16	1.8	5.1	23	1.8-	5.4

7.2 psi total 19:30 one compressor must be weak.

19:38 Off site 2108 Hoonah

100972 | 9/22/21 | RT7

15:42 Longmore Fuel. 15:54 On Site. Wx: Overcast, ≈50°F, N. Breeze.

Set up to start pond bubbler in P&T. Logger level: 1.15ft - a bit shallow. (SAIS start @ 16:00 as desired)

N. AIS (Pond bubbler) hrs: 8999.0.3 10.0 psi odd 9.6 psi even

Well	CFM Flow	psi	Well	CFM Flow	psi
ASW 1	1.9	3.5	ASW 2	1.9+	4.5
3	2.3	7.0	4	2.3	7.6
5	2.1+	7.2	6	1.9-	7.6
7	1.2	7.8	RW 2	2.3	4.4
RW 1	2.3-	3.8	ASW 8	2.0	6.5

16:14 switched; 16:27

Move ASW 7+8 lines to pond bubbler. Adjust flows.

Well	CFM Flow	psi	Well	CFM Flow	psi
ASW 1	1.9	3.8	ASW 2	2.0	4.4
3	2.4-	6.9	4	2.5	7.5
5	2.4-	7.0	6	2.4	7.5
7	1.4	2.8	RW 2	2.2	4.3
RW 1	2.1	3.75	Bubbler #8	1.4	2.85

16:43; 16:33 switched

10.0 psi 9.5 psi

Blower 2 looks Normal

E. AIS 7.2 psi on 2 blowers. Wrapped Glass filter jars seem OK.

Well	CFM Flow	psi
ASW 3	1.8-	5.4
ASW 9	1.8+	6.2
ASW 13	1.8-	5.5 dirty
10	0	7.2

The rest are "rattling" normally

17:05

17:24 Off site.

100972-001 | 10/7/21 | RT7

17:05 On Site. Wx: Mostly cloudy, mid 40's F, SW breeze.

DTW UST Yard: 9.03' btoc @ 17:15. Top of pump: 10.52 (cfe)? wrong 9.97 cfe

(Should be pumping)

DTW Holding tank: 6.61' below rim. ≈ 4079 gall.

12V. power to Abyss controller ✓

12V. power to pump leads ✓ should be running.

Jump across low water electrodes just in case - still no run.

- Pull Abyss pump. - Only 5-6 Volts to connector at pump.
- Corroded wires

100972 10/7/21 RZK

18:55. DTW UST vault: 9.0' BTOC. Top of Pump - 10.2'
Start pumping - works.
Flow rate: 20 oz. in 41 sec.
Bubbler & bubbling fine
Sample: 100972-UW13; 18:15; Groundwater at discharge to PWT holding tank from purged groundwater 3x40 ml vod w/HCl - GRO/BTEX

Reset to swap N. AIS. Not generating enough pressure for ASW 3, 5, 4, 6. Bubbler is on ASW 8 @ 1.2 CFM
Switch bubbler @ 1.2 CFM on ASW 7 / RW 1 & 2 @ 2 CFM
ASW 1 = 1.7, ASW 2 = 1.9. Total = 7.6 psi
(Power outage used 9/29, pump did not come back very strong)
19:40 Shut off.
20:32 Restart N. AIS w/ Spare Compressor.

N. AIS hours: 90353.0 Total psi Odd = 12.0 Even = 11.5

Well	CFM Flow	psi		Well	CFM Flow	psi	
ASW 1	3.0	4.1		ASW 2	3.0 3.4	4.8	
3	4.4	7.2		4	4.6 & 4.1	7.5	Valve needs to be adj
5	4.3	7.2		6	4.6 & 4.1	7.8	
bubbler 7	1.6+	2.5		RW 2	3.0	4.3	
RW 1	3.0	3.8		bubbler 8	1.6+	2.5+	20:59

Blower 2 105 CFM, 28" Vac. T.O. OK
RW 1: 65 CFM RW 2: 54 CFM 20:00
Heat Trace On
21:12 Off Site

100972 11/3/2021 RZK

15:00 On site. Wx: Mostly cloudy ~40°F calm.
15:20 DTW Holding tank: 4.39' = 97.95 gal.
DTW UST Vault: 8.68' BTOC after adjust: 11.8 psi
Stop groundwater pumping. Total add: 12.8 psi

N. AIS	Well	CFM Flow	psi					Well	CFM Flow	psi		CFM Flow	psi
Total	ASW 2	3.3	4.4	Turn on bubbler	Time is 1 hr ahead	off - Hostelco		ASW 1	3.9	3.6		3.0	3.6
psi	4	3.4	7.5					3	4.9	7.3		3.9	6.9
= 11.2	6	4.5	7.7	to 1.2 cfm		daylight savings		5	5.8	7.2		4.5	7.1
hours	RW 2	3.9	4.6					bubbler 7	1.4	3.8		1.7	3.8
= 90995.9	Bubbler 8	1.3	3.6					RW 1	0	3.7		3.1	4.4

15:30 16:46 16:54

100922

11/3/21

- Get Filter (GAC) drain to mw4 scrap. Keep bubbler running as long as possible.
- Pull Abyss pump from MST vent

S. AIS hours: 59889.8 Total psi: 8.8

Well	CFM flow	psi	
RW9	3.3	5.4	2 min
15	3.3	6.2	2 min
3	2.9	7.1	2 min
12	3.5	5.5	2 min
		16:58	

Wire newly rebuilt compressor (from N. AIS) into S. AIS wiring & test

10 CFM → 13.5 psi 20 psi → 7.2 CFM 10 CFM - 16 psi, then 14 psi

20 psi - 7.4 CFM

Compare to Spare compressor - N. AIS. - 10 CFM = 30 psi

15 psi is very high flow

Compare to E2 in S. AIS: 10 CFM = 21-22 psi 7.4 CFM = 25 psi

E2 is weak.

Decide to take rebuilt back.

18:46 - Start draining FRT holding tank.

18:54 - Start flowing into mw4

18:55 - Sample 100922-MW13; from holding tank normal end

Fixed pH meter, 3x 40 mL VOA w/ HCl - GRO/BTEX

** Turn pump, low water level **

Flow rate: 3.5 gal/min.

Disable bubbler, clamp MSW 7 & 8 back into ~~MSA~~ N. AIS

N. AIS hours 90999.5 Total event 11 psi add 11.3 cs

Well	CFM flow	psi	Well	CFM flow	psi
MSW 2	3.1	4.5	MSW 1	3.0	2.8
4	3.3+	7.6	3	3.3+	7.0
6	3.4	7.5	5	3.2	7.2
RW2	2.9	4.6	7	3.2	8.1
MSW 8	3.2	6.5 19:25	RW1	3.0 bounce	4.2 19:35

Blower 2 104 CFM, 29" H_2O RW1 = 64 CFM RW2 = 42 CFM

Sample 100922-TW013; 19:40 - Water after Filter (50 µm) + GAC at discharge to mw4 - 3x 40 mL VOA w/ HCl - GRO/BTEX

100972 11/3/21 RZW

E. Axis: 7.2 psi total
ASW 10 = 0 cfm @ 7.0 psi, ASW 21 = 1.7 cfm @ 4.9 psi — insulation eaten by squirrels
ASW 11 = 1.8 cfm @ 4.6 psi ASW 22 = 1.8 cfm @ 5.4 psi

20:10

20:20 Off site

100972 11/6/21 RZW

15:53 On Site. Wx: Overcast ~32°F, 3" snow on ground.

The P&T holding tank is empty. The pump is not running — GFCI breaker popped.

- Disassemble P&T treat heat exchanger.
17:30 Start transferring GAC
Make a composite sample of GAC in bucket for analytical sample.

17:38 100972-GAC21; 2018 to 2021 Granular activated carbon from Pump & Treat GAC drum. 1x 4oz w/25 mL MeOH = Total GRO/BTEX
1x 4oz full - %solids & TCLP benzene

Leave used GAC drum outside N. AIS fence, W. side, per Ian Goff

19:45 Calibrate vapor instruments. (PID not in case)

Blower 2

CFM	VAC	FID	LEL	O_2
105	28.5"	8.5 ppm	0%	19.9
Temp: 72 F				

RW1: CFM: 62 O_2: 19.4% LEL: 0% FID: 12 ppm Temp: 41°F

RW2: CFM: 39 O_2: 20.3% LEL: 0% FID: 2.5 ppm Temp: 42 F

Sample 100972-VE241; 20:15 2L AirToxics Summa # N6041, I.P.: 25.5
Final pressure = 3" Hg Vac. From Blower 2 exhaust
BTEX, TMB as gasoline by EPA 70-3

20:45 Off Site.

100972 11/18/21 RZW

14:02 On Site Wx: Clear, 5°F calm.
dsl modem SN: SR576AA040-00047F7
MAC address E82C6D54A508
WiFi Key 34549-2N4
Set up laptop in N. AIS shed - try to connect to dsl.

Rite in the Rain

100972 11/18/21 77°F

14:28 → 15:56 - Use cell phone as wifi hotspot, connect w/ Nathaniel @ Campbell Scientific in Utah,
- Find CR1000 B not communicating. Take silver box off back of data logger, reconnect - starts working. Internal reference error cleared by Nathaniel - Internet communication functional again.
- Refrigerate system components.
- Offload cleaned PAT system components.
16:30 - NAES on Odd bank - running well ~11 psi, similar flows to 11/3/21 startup.

16:55 S.AES - running, 8.8 psi, similar flows to 11/3/21

NAES each ~ 8.5 psi

Well	cfm flow	psi	Well	cfm flow	psi
ASW2	3.4	4.5	ASW2	3.3	4.4
4	4.2	7.5	4	3.6	7.5
6	3.9	7.6	6	3.5	7.6
RW2	3.7	4.3	RW2	3.0	4.3
8	1.0	Lifted graphite 6.3 @ 17:20	8	3.0	6.4 @ 17:06

total psi: 11.1 ✓

E.AES - Running bank B 7.2 total psi,
6.5 psi on just blower 2. → most of work.
Test blower 1 - 10 CFM @ 7.5 psi, just 3 cfm @ 15 psi, Max: 17.7 psi
Restart on blower 2 - sounds bad 6.3 total psi
Test blower 2 - explodes on startup.

- Take work rebuild & put in Blower 2 spot.
- Washed inlet & water fill tank on new #2
- Bank A valves opened. 19:00 Start Compressor 2
Total psi: 7.4

Well	cfm flow	psi	
ASW23	1.8	5.4	
ASW21	1.8	4.9	replace filter?
ASW16	1.8	5.2	
ASW11	1.4	4.2	carry added bag
ASW10	0	7.2	added bag

19:25

Unload
19:44 Off SAC

100972 (12/30/21) ANN

13:54 On Site, 11°F, Lt. NE breeze, overcast.

Start S. AIS. - RW15 is not flowing. SD working now. now is correct indicated.

N. AIS. Has trouble starting. Replaced relay. Power outage. Restart by generator.

* Plan to run N. AIS on Monday

14:40 N. AIS running

Open RW15, test air flow - flows fine

Pull RW15 gasket, replace air diffuser

16:10 S. AIS running

E. AIS: on 7 psi

Swap restart compressor hose E. AIS gauge at 6.9 psi on #1 only

Test compressor #2 - 16.5 psi @ 10 CFM

18:00 - Remove air hose from compressor. Off for night

Close South branch of E. AIS wells to get SVE flowing

Well	CFM flow	psi
ASW 17	2.0	5.3
ASW 20	1.9	4.3
ASW 23	2.0-	5.4
ASW 16	1.9	5.1
~~ASW~~		

Well	CFM flow	psi
ASW 14	2.0	7.4
12	2.0+	6.1
11	2.0-	4.2
10	1.1-	7.1

Total psi = 7.4

1.8145

N. AIS Feem: 11.0 DDP: 11.5

hours: 9232.5 Total psi

Well	CFM flow	psi	CFM	psi
ASW 2	3.2	4.3	3.3-	4.3
4	3.3	7.4	3.4+	7.4
6	3.3	7.5	3.4+	7.5
RW 82	3.7	4.4	3.0	4.3
ASW 8	2.9-	6.4	3.3	6.4

Well	CFM flow	psi	CFM	psi
ASW 1	3.2	4.0	3.2+	4.0
2	3.3	6.9	3.3+	6.9
5	3.4	7.0	3.4-	7.0
7	3.2	7.8	3.2+	7.8
RW 1	3.3	3.7	3.3	3.7

19:05

Blower 2

111 CFM, 24.5" Vac. RW1 = 60 CFM RW2 = 45 CFM

Drain 6 gallons water from K.O. 19:35

100472 12/30/21 ZJT, DLW

South AIS

hours: 60,571.4 Tot. PSI - 8.9

Well	CFM	PSI
9	3.5⁻	5.2
RW15	3.6⁻	6.2
3	3.0	7.5
12	3.6	5.8

19:35 Load gear.

19:52 Off site

2-7-2022 ZJT

13:45 - On-site, 26° overcast, NE breeze

Shovel clearing to South Shed + SAIS, NAIS, and EAIS. Several feet new snow.

South AIS: hours 61,035.3 Tot. PSI - 8.6

Well	CFM	PSI
9	3.3⁺	5.3
RW15	3.6⁺	5.9
3	3.0⁻	7.2
12	3.4	5.6

North AIS: hours - 93,254.2 Tot. PSI - Even 11.0 odd

Well	CFM	PSI	Well	CFM	PSI
2	3.3⁺	4.3	ASW 1	3.2⁺	4.6
4	3.4⁺	7.4	3	3.3⁻	7.0
6	3.4⁻	7.4	5	3.0	6.8
RW2	3.5	3.7	7	3.3⁻	8.4
ASW 8	3.3	6.5	RW1	3.4⁺	4.2

Blower 2

CFM	Vac	FID	LEL	O_2	Temp
105	31.0	9.0	0%	20.1	73°

RW1

CFM	FID	LEL	O_2	Temp
62	11.0	0%	19.9	-

RW2

CFM	FID	LEL	O_2	Temp
25	2.8	0%	20.4	-

2-7-2022 ZJT

EAIS: Tot. PSI = 7.5
#1 PSI - 6.5
#2 PSI - 6.2 (sounding rough ~ metallic ringing/clanking internally)

Well	CFM	PSI
ASW23	2.1	5.0
ASW20	2.0	5.2
ASW17	2.0	5.1
ASW14	1.9	7.5
ASW11	1.7	4.9
ASW10	1.1	6.8

Had to close South branch of EAIS to clear ASW10, got it flowing again.

16:15 - Load up gear; lock up buildings Leave Site.

7-19-22 ZJT + AAG

SAIS: Hours: 62,977 Tot. PSI 9.0

Well	SCFM	PSI
9	3.5+	5.5
RW15	3.6+	6.2
3	3.2+	7.5
12	3.5-	6.1

NAIS Hours 97,137 Tot PSI odd 11.5 Even 10.5

Well	SCFM	PSI	Well	SCFM	PSI
1	3.0+	3.7	2	3.2+	4.6
3	2.6+	6.8	4	3.2+	7.6
5	3.0+	7.2	6	3.0+	7.8
7	3.2+	8.0	RW2	3.3+	4.2
RW1	3.3	4.2	8	3.0+	6.8

Blower 2: 105 SCFM 31.5" H2O vac
PID - 4.4 FID - 7.0

RW1 70 SCFM
PID - 0.6
FID 0.5

RW2 30 SCFM
PID - 0.0
FID - 0.0

EIAS: Hours - N/A Total PSI - 8

Blower 1 psi = 7.5

Blower 2 psi = 6.5

	SCFM	psi
ASW 10	2.2	7.5
ASW 11	2.0	4.5
ASW 16	1.6	5.5
ASW 17	1.8	5.6
ASW 22	1.9	7.0
ASW 23	1.2	5.5

100972-001 7/28/2022 RAN BST

12:45 On Site WX: Clear, mid 60sF, N. breeze

S. AIS: 63085.5 hours RW: 9, 15, 3, 12

8.9 psi @ 3.5 to 3.0 psi

Test on blower E1 @ 10 CFM = 20.5 psi

Swapped in E1 blower to SAIS Baseline @ 10. CFM = 10.5 psi.

14:20 Start E1, adjust flows Total psi: 8.2

RW 9	2.3 CFM	5.1	
15	2.4	5.6	
3	2.2	6.7	14:26 Greased
12	2.3+	4.7	

Take "Spare" compressor out of N.AIS (vanes failed) & replace with compressor E2 Greased

Re-program timer - Timer still doesn't switch.

15:40 Start on odd bunk.

Start setting up pump trailer.

UST Vent dtw: 7.40' btoc, bottom @ 11.48'

Start pumping @ 17:30 ≈ 0.6 gallons/minute

New desiccant in Tank Transducer line.

100972-001 7/28/22 RTH ZJT

NAIS Tot. PSI 11.2

Well	SCFM	PSI
1	2.2	4.0
3	2.8	7.4
5	3.0	7.4
7	2.6+	8.1
RW1	2.4	4.3

17:45

Well	SCFM	SCFM	PSI	
Total psi:			10.5	
Abs 2	3.1	2.5	4.3	
4	3.5	2.7	7.7	
6	3.3	2.7	7.6	
RW2	2.7	2.5	4.7	
Abs 8	0	2.7	6.7	20:20

Blower 2 leaks nominal - change desiccant at next event

- No, changed.

Blower 2

103 CFM, 32" Vac RW2 Flow 0 to 20 ?

RW1 Flow 90-95 CFM

Vapor Extraction System Tot. 102 SCFM @ 32" H_2O Vac.

VE1	35 SCFM	35 SCFM	33" Vac
RW2	15 SCFM	40 SCFM	
RW1	55 SCFM → Closed, flow meter stuck		

Open RW1 & RW2 - RW1 Monument settled, cap broken - all of vacuum is pulling through hole in cap.

18 psi in RW1 packer

0 psi in RW2 packer - sparge air is bubbling in well.

- Pull RW2 packer, Scrub scale in bottom water table with stiff brush, test packer, reinstall packer.

Air line on cap (Sparge rubber hose) had crack in brass fitting.

- Take cap off RW1 assembly. Close RW1 sparge line. RW1 Off line.

Swap main timer with well timer in NAIS & reprogram

- Switches properly @ 21:00

Load used GAC into pickup using a ramp.

21:30 Off site.

100972 | 8/15/22 | ACH/ZJT

12:25: Wx: Overcast ~60 Lt. N breeze

S.AIS: Battery @ 7.1V, override switch not working.
Check wires on battery clip - wire repair
- Program S.AIS for 4hr. On, 2hr Off

- Pull RW-2 setup - No air in packer. New packers have different air supply fittings.

13:45 Zach off for other job & to look for fittings.

- Pull RW1 Prepare to replace packer & cap.
Cut RW2 down 0.1'

NAIS PSI Tot. 11.0 psi ; 97,786 hr.

Well	SCFM	PSI
1	3.3+	4.1
3	3.2+	7.0
5	3.6	3.3
7	1.6	3.4
RW1	2.0	4.7

19:00 Packer Pressures: RW1: 32-33psi / RW2 35psi
Fence up @ PHT
Calibrate Vernier instruments
Blower 2 with VE1, RW1, RW2 all flowing - RW2 high resistance.

CFM	VAC	FID	PID	O_2	LEL
86	42	10 ppm	5.7 ppm	19.9%	2%
102	30 "H2O	20. ppm	12.0 ppm	19.8%	2.0%

	VE1	RW1	RW2
CFM:	26	55.0 CFM	~~8~~. 32 CFM
FID:	3 ppm	22.0 ppm	8.5 ppm
PID:	1.7 ppm	9.1 ppm	5.8 ppm
O_2:	20.0%	19.7%	19.8%
LEL:	0%	2%	0%
	closed	78 CFM	31 CFM

20:00 Sampled holding tank fill line in designated
100972-~~HT~~ HW 21 (3x VOAs)

Snow fence is staked up around pump & treat area.

NSAIS Tot PSI 11.0 ; 97,787

Well	CFM	PSI
2	3.1+	4.8
4	3.6	7.6
6	3.4	7.7
RW2	2.1	5.0
8	1.5	3.3

100972 8/15/22 RTH/ZST

2031: UST Vent DTW 10.57' bgs
Holding tank South access DTW. 4.94' ≈ 8380 gal.

21000 off 58Hz

100972-001 9/16/22 RTH/ZST

14:25 On site. Wx: Lt. rain, calm, 50±F
P&T Holding tank has been full since 8/30/22. Set up to drain.

DTW UST Vent. 6.72' @14:50, Holding Tank: 1.15' below riser (18139 gal.)
BTOC Good level for shut off switch.

N. AIS Running on even bank only. 98550.2 hours

Well	CFM	psig
ASW 2	2.9	4.8
4	3.7	8.0
6	3.6	7.9
RW 2	2.0⁻ bounce	5.0
ASW 8	1.2⁺	4.7

Bubbler in P&T tank

Blower 2
95 CFM, 27.5" H_2O Vac, K.O. OK. RW1: 84-89 CFM bounce
RW2: 25 (min) CFM
VE1: closed

Start draining P&T holding tank through 50µm filters + GAC @15:58

Shut down N. AIS @ 16:03

Discover GAC drum has a leak - corrosion by outlet fitting.
16:10 Shut down drain/treat. Allow GAC to drain to Mett.

Sample HTZLS, 16:30 Water in P&T Holding tank, collected w/ dedicated poly bailer. 3X 40ml VOA w/HCl - GRO/BTEX

Removed GAC from drum - discovered several rust perforations in bottom of drum. Look for options around here. Decide best not to drain tank.
Drain hoses & filters to GAC for return to tank
17:40 Treatment/drain disconnected

100972 9/16/2022 7224

Disconnect Bead bubbler hoses from ASW 7+8, reconnect ASW 7+8 hoses.

Wire in new timer for N.AIS bank switching.

On = Odd bank. Program for 3hr. on, 3hr off. Off = even banks

Readjust flows

N.AIS	11.4psi total			11.4psi total		
Well	CFM	psi		Well	CFM	psi
ASW 1	2.4	3.8		ASW 2	2.4	4.6
3	3.0	7.5		4	3.0	7.9
5	3.0	7.5		6	3.0	8.0
7	2.4	8.2		RW 2	2.4	5.2
RW 1	2.4	3.5	19:05	ASW 8	2.4	6.9 19:15

Packer Pressures: RW2: 26psi - leave

RW1: <5psi - Pump up to 36psi

S. AIS	64077.7 hrs.		8.7psi total
Well	CFM	psi	
RW 9	2.2	5.4	
15	2.5	5.7	
3	2.3	7.1	
12	2.6	5.2	19:45

Shut down & wire in new timer. Normally closed (off = running) 4 hours running, 2 hours off.

Tork ~~EZ10~~ 120 EW2 20:45

Rebuilt spare compressor left in SAIS shed.

Walk through E.AIS: 8.0psi on 2 blowers.

ASW 10 & WCFM, ~8psi, No water. Others are rattling.

3 plastic trashcan covers are damaged.

21:05 Offsite.

100972 9/22/22 2JT

13:30 - Arrive on-site WX. 50° overcast slight rain, Wind 7-10 NE
- Go into shed to retrieve hardware to set up P&T

14:30 - GAC assembled w/ new drum. Lid will not seal w/ old ring re-fit the system with old hardware on new lid/ring. The system is still seeping and losing water in a few places around ring seal.

16:15 - Found 2" ball valve. Installed b/t particle filters + gac drum to reduce flow + pressure at drum head to stop leaking around the GAC lid.

16:45 - P&T running smooth, all leaks sealed once in-flow was turned/ back down. Measured effluent @ 2 gal/min discharge

17:00 - Collect sample 100972-TW01 water after filter (50 µm) + GAC @ discharge to MW4 ~ 3x40 ml VOA w/ HCL GRO/BTEX

17:15

NAIS Tot PSI 11.5

Well	CFM	PSI
2	2.2	4.9
4	3.1+	8.0
6	3.2-	7.9
RW2	2.8-	5.0
ASW8	2.4	6.9

Tot PSI 12.0

Well	CFM	PSI
ASW1	2.4	4.4
3	2.9	4.0
5	3.4	7.4
7	3.2	8.4
RW1	2.4+	3.9

17:25

SAIS Tot PSI - 8.4

Well	CFM	PSI
RW9	2.2	5.5
15	2.4	5.9
3	2.0	6.9
12	2.3	4.9

17:30

EAIS Tot. PSI-8.2

Well	CFM	PSI	
23	2.0	5.9	
22	1.9+	7.0	Needs
21	1.8	5.0	+ New insulation
20	1.9	4.9	
19	2.0	6.5	
18	2.0	6.0	
17	1.8	5.9	- 17- New cover/Bricks
16	1.7	5.5	
15	1.9+	7.0	-15 New insulation
14	1.9	7.5	
13	1.8-	6.1	-13 - New Cover + insulation
12	1.8	7.0	12 - New insulation
11	1.8+	4.9	11 - New insulation
10	1.4+	7.9	10 - New insulation

Drained H2O from EAIS outlet near well 10

18:30 - Leave Site.

100972 9/27/22 ZST

9:30 - Truck loaded w/ gear - depart Anc office
12:45 - Arrive on-site. wx. 49°, clear, calm.
- Grab addition tools/gear from shed then head to P+T station
  - Disassemble GAC plumbing (put back in shed storage)
  - Yellow power cord GFCI tripped. Reset + checked submersible pump. Pump is fine, didn't burn up running dry.
- Tank is completely empty.

- 13:30 - DTW @ UST 6.95' BTOC - start up pump @ UST → P+T Holding tank
13:45 - Collect sample 100972-UV22; groundwater discharge to P+T holding tank from purged aquifer. 3x 40 mL vials GRO/BTEX

Note- check the float switch shut-off, + power is good. close-up the P+T tank.

14:05 - Move on to checking sparge wells bladder pressures.
RW1 - peaked @ 20 psi - pumped back up to 35 psi
RW2 - peaked @ 25 psi — " " " "
RW15 - peaked @ ~27 psi — " " " "

14:30 - NAIS Tot PSI 11.5 psi - 12.0 psi

Well	CFM	PSI	Well	CFM	PSI
1	2.2+	4.0	2	2.7	5.0
3	2.9	7.4	4	2.8	7.9
5	3.2+	7.6	6	2.7	8.2
7	2.9	8.3	RW2	2.5	5.2
RW1	2.2+	4.6	8	2.4	6.9

14:40 - SAIS Tot. PSI 9.0

Well	CFM	PSI
9	2.3	5.6
RW15	1.9	10.0
8	2.2	7.2
12	2.3	4.7

14:50 - head down to EAIS, quick clean-out of well 10 flow gauge
15:30 - Leave site.

100972-001 | 10/19/2022 | RCH

14:45 On site. Wx: Mostly cloudy, 44°F, S. breeze
prep to drain PRT holding tank

DTW Holding Tank: 2.24' below rim @15:09 ≈ 15,300 gallons
DTW LST Vent: 8.91' BTOC while pumping
15:10 STOP pumping from LST Vent.

15:55 Start draining tank - had trouble getting Wayne ½hp pumping
Discharge rate at ground (to bucket) ≈ 2 gpm
audibly fast with hose down MW4

Remove Absyr pump & float switch. Leave bladder in casing low

Sample 100972 HT22; 17:00 from north end of holding tank using dedicated poly bailer. 2 x 40ml VOA w/ HCl - G/B/Brex

When I pulled the hose to sample toward water @ MW4 the water flow stopped. Pull the Wayne pump - not running
GFCI breaker not tripped - power to cord.
Tested GFCI - would not reset. Replaced GFCI outlet in N. AIS with load one from E. AIS.
Tested OK. Wayne pump died. Tested model powerful Little Giant sump pump. Flow = 5.25 gpm. Throttle down w/ ball valve to ≈ 4.25 gpm.

Sample 100972 TW022: 18:36 - PRT discharge to MW4. 2 x 40ml VOA w/ HCl G/B/Brex

N. AIS 99345.5 hours 11.4 psi add 12.5 psi cfm

Well	CFm	psi		CFm	psi		Well	CFm	psi		CFm	psi	
MW1	2.2	4.0		2.4	4.1		ASW2	2.6	4.9		2.6	4.9	
3	2.5*	7.9		3.4	7.7		4	2.6	8.1		3.4*	8.2	
5	2.5	7.5		3.4	7.8		6	2.8	8.1		3.4*	8.2	
Bubbler 7	3.7	(Trio mech) 6.6		1.4	4.4		RW2	2.5	5.2		2.5 bounce	5.1	
MW1	2.7	4.6		2.5	4.8		bubbler 8	2.3	5.1 (Trio mech)		1.4	4.4	

18:30 switch - grounded discharge 19:00

Calibrate vapor instruments - I grabbed old air check pump. It won't pull enough vacuum plugged in.

Blower 2 - Heat trace turned On

	RW1	RW2	VE1
CFm	90-95	≈ 0 <20	Closed
Vac	Adjust 19:10	CFm ≈ 0	CFm 26
FID	CFm 75	CFm ≈ 0	
PID	temp: 48F	temp: 46F	Temp. 48F
O2			
LEL			

CFm	Vac	FID	PID	O2	LEL
92	40"				
101	33-34	6 ppm	4.3 ppm	20.1%	0%
temp:	77F	7			Localized 2%

* No air check pump

Rite in the Rain

100972 10/19/22 MEN

I switched N. AIS to even bank - Ran Blower 2 readings:

Blower 2 overall CFM	Vac	RW1	RW2	VE1	
103	31"	61 CFM	30 CFM	24 CFM	19:30

S. AIS 64605.1 hours 10.7 total psc.
Compressor closest sound gauge right etc.

Well	CFM	psi		CFM	psi	
RW9	2.4+	5.6		2.6	5.7	Total psi: 9.8
15	0.4 to 1.3 bounce	10.2	Adjust	~1 bounce	9.2	
3	2.2	7.4		2.6	7.9	
12	2.3	4.7		2.6	4.8	
		19:40	Try to blow out RW15 - No luck			19:50

E. AIS; Both compressors running. 8.2 psi total.

20:00 Off Site

100972-cont [10/21/22] MEN

16:05 On Site Wx: Clear, 40°F,
Tank is drained, disassemble P&T system.
DTW UST vent: 7.94' BTOC @ 18:12

Suction from water siphoning to RW4 has deformed GAC drum.

19:00 - Pull RW1 packer assy. Find air leak @ last compression fitting on packer - tighten. Seems to work. Install & inflate to 22 psi.
Was going to change out diffuser on RW15 but things are freezing up and I can't (see VS) packer: 35 psi
RW2 packer: 35 psi

N. AIS - Arrive. Sw 7+8. Adjust. Hours: 9395.3

Well	CFM	psi	total: 11.5-11.6	Well	CFM	psi	total: 11.5
AGW1	2.2	4.1		MSW2	2.5	4.9	
3	3.0+	7.7		4	2.9+	8.1	
5	3.2	7.7		6	2.9	9.1	
7	2.0+	8.3		RW2	2.5 B	5.0	
RW1	2.5	4.5	20:34	MSW8	2.5	6.9	
Blower 2	31" H2O, 104 CFM, RW2: 26 CFM.						20:40

S. AIS O.K. as above. 20:55Z Off Site

100972-001 12/16/2022 RTH

15:05 On site. Wx: Clear, calm, -3°F
Should snow for recess, 1 new add'l loc'ts
S.AES: Motor running, compressor sized up? Shaft flex broken.

N.AES: No electric power. - Find breaker @ meter on side of ZipMart building off. Meter box pried out / tampered with.
- starts up when switched on
- Timer programming lost. Data logger battery drained out.
- Restarts O.K., connects to network.

N.AES 9961 2.0 hours,

Well	CFM	psf
Asw1	2.3	3.9
3	3.1	7.5
5	3.4	7.5
7	2.1+	8.1
Rw1 low	2.9	4.1
total:	11.3 psf	17:50

Well	CFM	psf
Rw2	2.6+	4.7
4	2.4	7.9
6	3.0	8.1
Rw2	2.5	4.8
Asw8	2.6+	6.8
total psf:	11.5	20:00

Blower 2 K.O. dug. RW1 RW2 VE1
CFM: 108, Vac. 28" 60 cfm 30 cfm 25 cfm 17:53
(Started slow, VE1 frozen, 75 cfm est, later restarted)

S.AES Remove compressor. Install spare compressor. Clean filters installed. Greased Start @ 19:05
hours: 6555 31.8

Well	CFM	psf
Rw9	4.2	6.4
5	1.4	11.9
3	3.6	10.4
12	4.2	5.9

12.6 total psf
19:38

Motor fan is rubbing on guard. Open, slide fan up slightly, tighten.

20:13 Off site.

12/19: Compressor 'E1' taken from S.AES - Flexible coupling has just slid apart. Both set screws missing from fan side. Install spare, fan side, tightened & left tight. Test: 11.5 psf @ 10 cfm. 20 psf @ 3.8 cfm RTH

Log 971 | 1/28/2023 | RTN

15:20 On site. Wx: Ptly cloudy, 30°F.
N.AIS + Blower 2 are running - look normal
DSL modem, router, DSL, Ethernet lights are on. Try to confirm - directed to ACS, door must is closed.

S.AIS: Motor cooling fan is loose & rattling. Will leave compressor
hours 66216.0 psi 12.9
Battery charge light - no data logger
not on. No AC to charger. Still
Still not charging
11.8V in battery, AC adapter bad.

Well	CFM	psi
RW9	3.7+	6.0
15	0	12.1
3	3.7+	9.7
12	3.8	5.4

15:50
Timer shuts off properly @ 16:00

Try to find old AC supply from E.AIS - not here.
Try using PWR 12V power supply for S.AIS logger + only
voltage reg. Connect battery charger to
SAIS logger battery (disconnected).
Shovel snow & clear.
E.AIS - both compressors running, 8.0 psi total
Data logger good.
N.AIS: 00640.8 hours, Event: 11.0 psi total

Well	CFM	psi		CFM	psi
ASW2	2.5	4.7		2.4	4.6
4	2.1	7.9		2.9	7.9
6	2.9	7.8		2.9	7.8
RW2	3.6	4.8		2.5	4.7
ASW8	2.3+	6.7		2.6	6.8

17:26 17:27

Well	CFM	psi	CFM	psi
ASW1	1.2+	3.6	2.4	3.8
3	2.8	7.4	3.0	7.5
5	3.0	7.4	3.2	7.5
7	1.8	8.0	2.2	8.1
RW1	3.6	3.6	2.5	3.5

19:54

Old - main timer for N.AIS dead. Fortunately wired normally closed. Turn off N.AIS blower + logger.
Disassemble CR1000 to clean memory connections.
Reassemble - Get connection to table 1 - last readings @ 17:30 17:45. Then loose connection. Try disassembly again - No luck, loose connection immediately. 19:42 Turn compressor on - is on odd [illegible] it should be.
- Swap E1 compressor back into S.AIS. Replace motor fan from spare compressor. Restart @ 19:26

Blower 2 107 CFM, 29.5" Vac, RW1 53 CFM, RW2 31 CFM
K.O. OK ASW1 1.26 CFM
20:57

100972 4/28/23 R.T.+

Uncap. RW-2 well head - check packer - 24.5 psi. Good. Only able to get it up to 27 psi with hand pump. 20:25

S.AIS 10.0 psi

Well	CFM	psi
RW 9	3.1	5.5
15	0	9.3
3	3.4	7.1
12	3.81	4.8

RW15: Heat trace is on, so not likely frozen line. Too cold to pull packer & replace diffuser.

20:45 Datalogger battery full - 13.8 V. should go a few weeks

N.AIS Gate - broke paddlock hasp. Just zip tied closed

E.AIS Walk through: 3 small totes fallen around ASW14, Missed well. ASW10 - Not flowing, not frozen ASW23 - 1.9+ CFM @ 5.8 psi, else OK 21:20

20:30 Off site

100972 4/13/23 ZJT

12:45 Arrive on-site, clear a path to main shed.

13:30 North gate latch repaired. Although could use a larger mounting bracket. (Not actually repaired - brought part back for other)

NAIS hrs 2,435 Even psi tot = 10.5 psi Odd psi tot = 11.5

Well	CFM	PSI	Well	CFM	PSI
2	2.5	4.6	1	2.5	4.5
4	2.5	7.6	3	2.6	7.1
6	2.4	7.7	5	2.4	7.0
RW2	3.8	4.9	7	3.0	8.5
8	2.5	6.5	RW1	2.4	3.5

14:00 - Mistakenly replaced adapter to NAIS data logger. Now going to transfer AC DC adapter to SAIS data logger.

15:00 - checked battery in SAIS data logger. Confirmed it is charging properly. Went from 6.36 v to 12.42 v

13:15 SAIS hrs 67,413 PSI Tgt. 9.6

Well	GPM	PSI
9	2.5	5.4
15	—	11.0
3	2.5	6.6
12	2.4	5.4

15:30 Move over to EAIs, attempt repair of well covers.

100972 5-22-23

13:05 - on-site. wx. partly cloudy - 57°

observe + photograph snow damage to Zip-mart bldg + N.AIs power line.

Checked the modem for the data logger, radio, and controllers in NAIS to see if logger can be moved to the SAIS. Unclear; need to talk to Randy. Took pictures.

Checked SAIS. Well 15 completely blocked. attempted to remove packer/diffuser. Was unable to alone. Will try later this week w/ Alec on our way to CPL.
Adjust the other wells, + head to EAIS

EAIS blower 2 had debris (plastic + grey fibers) clean out inside cooling fan guard. Drained the H_2O out of the EAIS lines. then walk through of the wells. Wells O.K.

Recheck blower 2 EAIS - maintaining 9.0 PSI. Decide to leave in-place. Will likely need replacing / swap w/ spare on next trip.

Fixed the EAIS gate latch, appears to have been bent from the gate being overloaded w/ snow.

Plan for next trip: pull 15 and replace diffuser, potentially swap EAIS #2 w/ spare. Finalize data logger plans w/ Randy for the summer.
Power to NAIS ~ potentially run P+T off batteries.

100972 | 6/27/2023 | 8270

15:33 On site. Wx: mid 50s, light rain NE breezy.

S.A.I.S: 6860 scfm hrs. 12.0 psi

Well	CFM	psi		CFM	psi
RW 9	2.4	5.9	+	2.8	6.0
RW 15	closed	0	+	—	
RW 3	2.4	6.9	+	2.8	7.2
RW 12	2.0	6.1	+	2.2+	7.0
		15:55		Total: 10.7 psi 1559	

N.A.I.S - Turn off data logger - check battery - change batteries
hours at prev. visit: 6352.0
Put chain + padlock on gate.

Rebar marking S.E. corner of property (Sec 25 Swanson River Rd.) is easy to find. Not flagged. Add to take photo.

- Clear out brush along property line to east.
- Try to locate S.W. corner of L.F. 78 - No rebar found. Mark a temporary location based on a rough survey plat.
- Mark a Proposed Power drop location ≈ 2.5' south of property line so comfortably in ROW. - Lay stake + white paint. ≈ 20' SSW of old water well, ≈ 15.3' east of S.W. corner.
- Mark gasline location w/ yellow paint
- Mark RSW7 on air line w/ white paint (orange is dead)
Take photos.

RW-15 Pull packer/air assembly + replace air diffuser. Last piece of new 1" OD slot diffuser.
Flow not great + trouble getting to 2 cfm @ 12 psi. Maybe? pull out some of red flex hose + re-fit into 4" pvc -
Better - Unsure if replacing more getting well - Should replace w/ swivel setup. 20.40

S.A.I.S

	cfm	psi	Total psi: 9.1
RW 9	2.4	6.0	
RW 15	2.4	7.1	
RW 3	2.4	6.9	
RW 12	1.8+	5.5?	20.58

1004? ? 6/27/23 R.E.W

L. ATS: Both blowers running - F.O.C. [illegible]
[illegible] Outlet pump fan on Blower 2 has failed, flinging around loose. Take fan off of spare compressor (with d. Heater). It was not cut on the shaft quite far enough, but usable.
Install on blower 2.
- Black plastic at water end fan of blower 1 has also failed. Replace blown fan with new spare.
- Sweep up
- Vacuum dust out of inlet pre-filter of blower 1
- Put fresh inlet filter on blower 2
- Put fresh outlet filters on blowers 1 & 2
(blower 1 filter holder falls out in canister)
(22) - Grease both motors
10:48 restart. 86 psi.
Walk through LATS wells.
- 3 small black spruce down around ASW 14 & 15 no damage
- ASW 10 will not restart & freeze
- All other wells working. ASW 23 - 1.4" ice ball

(23)
11:15 Off Site

[7/28/23]

RTW

1004? -001

9:26 On Site. Wx: frost, mostly clear, calm
9:29 Big G Electric on site - Jay & Brandon. Mini Excavator
Walk through utility locates & other possible underground.
Roll back NATS chain link fence.
Help hand dig by gas line & bed. Get up brush & trees & stack in grove by S.E. corner.
- Crew excavates 26-28" deep trench. 1¼" conduit laid & (14 gauge?) wire pulled through. Connection at Blower 2 heater box made.
- I install CSI CELL 205 LTE router & LTE Antenna & try to set up CR1000 to communicate. CR1000 seems to have lost some programming, error messages. Battery charging in SATS data power supply.
- Work w/ crew to re-install chainlink fence.
18:38 Big G Elect. off site.
- Pull apart CR1000 & reassemble. No luck.

100977.1 9/29/23 REZ

S.AIS 7098.2 hrs., 9.5 psi

well	CFM	Flow
RW9	2.8	6.1
RW15	2.5	7.3
RW3	2.7	7.1
RW12	1.3	5.9

20:00

RW12 doesn't open up - probably time for new air diffuser

E.AIS running at 8 psi - Wells steam off. (Gatts matching)
- remember bow saw next visit.

20:25 off site

100977.2-001 10/5/23 RJN

11:06 On site. Wx: Blustery W. wind, 40s F, Overcast

Move charged battery from S.AIS logger to N.AIS logger
replace S.AIS original battery + restart.

Set up on N.AIS logger. With laptop computer. Backup logger, install updated O.S. 32.05, restore files. - No com. Call Campbell Sci. Support - walk through settings - Make CR1000 Port Bins 9. - Gets working. Download data. CR200s are very slow. - stop these downloads for now - No CR1000 data returned from before power outage.
With new system, must use PC400, LoggerNet, or LoggerLink to see data.
pack up.
13:42 Off site to other job
15:54 On site Wx: Rain.
Setup LoggerLink on phone to new system - works
-E.AIS: - Clear fallen trees out of the way
- Replace white towers on RSW 13, 16, and 17 with blocks.
(RSW 23 - covered in gravel, racked, + put back)

well	CFM	psi						
RSW 10	0	7.4		RSW 17	1.0 CFM	6.0 psi		
11	0 rattle	5.0		18	6.0	6.0		
12	0 rattle	7.0	dirty	19	0	6.6		
13	0	5.9	water to 6.3	20	0 rattle	5.2	can see 4 front	
14	1.4	8.5	can see 1.9 back	dirty 21	1.3	5.4		
15	1.2	6.8	"	dirty 22	0	7.0	can see 6.5	
16	<1 not	5.8		23	1.1	6.2	can see 1.4	

18:10

100976 10/5/23 RZ 7K

E. AIS - Flow meter balls were obviously vertically active on 7/28.
Pressure transducer ~ 6.2-6.3 - probably one blower out
Total main gauge - 7 bar. Fully relieving pressure - only drop to 6.5 bar
Compressor #2 is running & making pressure
Compressor #1 is running but making no pressure 18:45

Put new compressor cooling fan on SPARE, check motor, Fan - good
Grease motor bearings - Smart.
Install SPARE in E. AIS 1 position. New solenoid + wires.
(Note of old #1 failed pressure) 20:25 Running on SPARE
Ranger did not test [illegible] checked to 8.0 on new SPARE
Cleaned [illegible] and left running
- Drained water from ASW13. It came back

	Ser	Ecc		Well	Ctr	Ecc
ASW	0	7.9		ASW 17	1.8	6.0
11	1.9+	5.4		18	1.9	6.1
12	Can't read. 1.6?	7.2	Ecc [illegible]	19	1.9	6.2
13	1.6 Wet	6.2	Air from [illegible]	20	1.9+	5.1
14	1.8+	7.2	[illegible]	21	1.8	5.4
15	1.8+	7.0		22	1.9	7.2
16	1.9?	5.9	Low	23	1.8+	6.2

21:23 - Closed & covered N. AIS wells
Repack.
21:45 off site

[10/13/23]

100976 RZ 7K

12:15 On site ZipMart. Wx: Upper 30s F, overcast, calm
- Big Ghas completed the connection to the meter. Pole & meter in place.
Get Vapor instrument charging.
- Confirm power works. N. AIS odd switching solenoid is crunk
a/f rating + jacket, both risers are dead (No water/flow for years)
- Put new battery (9V) in old main trace. Reset clock etc.
- Tap and rotate solenoid - begins working. Reset switching timer as capistor charges.
- Check out Knockouts on Blower 2 VES - get a little water out
- Check out N. AIS Compressor - Cleaned outlet filter of oil, touch of grease. Find motor fan is on backwards - turn it around - has a bit of excess grease & a crack but functional.
RW1 packer: 0 psi initially. Fill to 33 psi. RW2: 14 psi, initial to 36 psi.

100972 10/13/23 NZH

Calibrate vapor Instruments

Blower 2 - Start @ 14:50 Heat trace on.

CFM	VAC	FID	LEL	O_2
103	28.5	20 ppm	0%	20.9%

Temp: 58F

RW1: CFM 52 LEL: 13% O_2: 19.8 FID: 100 ppm Temp: 46F

RW2: CFM 525 - may be bad LEL 0% O_2 20.9% FID 2 ppm Temp 45F

VET: Open, No flow registering has vacuum LEL: 8% O_2: 20.5% FID 12 ppm Temp: 45F. 15:10

Recheck main FID: 45 ppm 15:16

15:18 Start N. AIS - Sounds a little rough

hours: 02584.5 even bank total: 10.5 psi total psi with just 6 open is only 11.5

6 flowing @ 2.5 CFM, 8.5 psi

Well	CFM	psi	
ASW 2	2.2	5.0	
4	0	7.4	open 4
6	0	7.4	
RW 2	2.6+	5.2	
ASW 8	0	6.9	

15:30 - Meet Ben Madrid - HEA engineering tech

15:33 - Compressor sounds better 13 psi

15:42 ASW4 = 5.5 CFM, ASW6 = 4.9 CFM. Open 8 - OK, open 2 4 2

Well	CFM	psi
ASW 2	2.2	5.0
4	2.7+	8.1
6	2.7+	8.0
RW 2	2.5	5.1
8	2.5+	7.0

Total: 110 psi 15:47

Well	CFM	psi	
ASW 1	2.0	4.2	(shallow #9)
3	3.0-	7.8	
5	3.0+	7.7	
7	1.8+	8.4	
RW 1	2.6	4.8	

16:00 OK - Switch back

Close RW1 & RW2 heads - pressure steady

Check LoggerLink - connected, shows North system, but currents for both blowers don't make sense. There were some loose wires last visit. Get wiring chart, hook up laptop for real time monitoring. Sort wires out currents OK. 17:00

Blower 2 with N. AIS Even bank running

CFM	Vac	FID	LEL	O_2
98	34	175 ppm	0%	19.4%

Temp: 77F

Varies up to 6% LEL

Tried to zero LEL, then wanders up.

RW1: CFM 69 Temp 46F LEL 19.0 O_2 19.0% 0% FID: 195 ppm

RW2: CFM: 0 Temp: 45F LEL: Wiped 0.0% O_2: 20.3% FID: 30 ppm

VET: ≈ 20 CFM, 20.6% O_2 LEL working, FID: 20 ppm. Temp: 45F

17:25

10/17/23

Packer pressures	orig.	new	
RW9	15psi	35psi	
RW12	almost 0psi	38psi	could never get sampling port packer
RW15	26.5psi	34psi	
RW3	15psi	28psi	

Old RWs need new 34" round covers 2" thick

SVE IS 7 @ 37.8 hrs, 9.5 total psi

Well	CFM	psi
RW9	2.4	6.2
15	2.3	7.5
3	2.5	7.1
12	1.2+	5.8

19:00

E. AIS: Both blowers running, 8.6 psi total

ASRW13: Water has cleared out. running @ 1.5 CFM, bump to 1.9 CFM @ 6.2 psi. add a sand bag over weep insulation

ASW10: No running, looks dry. Try closing Southwells to start.

ASW10 running @ 1.9 CFM, 8.9 psi

Add sand bag to ASW12 (1.8 CFM 7.3 psi) for

ASW11 running @ 1.7 CFM @ 7.6 psi

ASW 18 running @ 1.8 CFM, 6.2 psi

ASW 22: 1.8 CFM @ 7.0 psi. Add sand bag

ASW 23 1.7 @ 6.1 psi

19:50 - Off site

APPENDIX E

IMPORTANT INFORMATION ABOUT

YOUR GEOTECHNICAL/ ENVIRONMENTAL REPORT

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the Geoprofessional Business Association (https://www.geoprofessional.org)