

Revised 2024 Alternative Water Supply Plan

Former North Pole Refinery, North Pole, Alaska

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AWS	alternative water supply
CWMA	critical water management area
FHRA	Flint Hills Resources Alaska
GAC	granular activated carbon
Integral	Integral Consulting Inc.
O&M	operation and maintenance
POET	point-of-entry treatment
Site	former FHRA North Pole Refinery
Williams	Williams Alaska Petroleum

1 INTRODUCTION

On behalf of Williams Alaska Petroleum (Williams), Integral Consulting Inc. (Integral) has prepared this Alternative Water Supply (AWS) Plan for properties surrounding the former Flint Hills Resources Alaska (FHRA) North Pole Refinery (Site) in North Pole, Alaska (Figure 1). This AWS Plan details activities to address private wells in the Site vicinity that have detectable levels of sulfolane and are not connected to municipal water supplies. Further, this AWS Plan satisfies the requirements set forth for alternative water supplies in the Judgment of March 23, 2020, and the Amended Judgment for Injunctive Relief (Amended Judgment) dated December 4, 2023.

Since the initial detection of sulfolane in groundwater in approximately 2008, the Alaska Department of Environmental Conservation (ADEC) has worked with Williams and FHRA to address groundwater contamination and private well impacts. Additional information, key project documents, and response activities are available on the ADEC North Pole Refinery website.¹ A summary of past AWS activities is provided in Section 2.

The objective of this report is to offer a plan to address the potential for continuing exposure of residents to contaminated groundwater. The components of the plan are outlined in the following sections:

- Section 3 provides a description of the plan to identify remaining properties with sulfolane-impacted private wells that are not connected to municipal water. It also lays out a plan for the tracking, compilation, and communication of property and well information collected during this process.
- Section 4 provides a description of the plan to identify and provide AWS to impacted properties. This includes property screening methods, decision trees to guide future activities, and the types of AWS to be provided. It also includes a description of the long-term operation and maintenance (O&M) and monitoring activities associated with the selected remedy. Last, it identifies criteria and decision points for the discontinuation of AWS.
- Section 5 provides a description of the plan to petition for the creation of a Critical Water Management Area. This would provide a regulatory structure to explicitly track new well installation, require the use of piped water or point-of-entry treatment (POET) water for domestic water use, and ultimately reduce exposure to contaminated groundwater.

¹ <https://dec.alaska.gov/spar/csp/sites/north-pole-refinery/documents.htm>

2 PREVIOUS AWS ACTIVITIES

Past AWS activities have been compiled in the FHRA Alternative Water Solutions Program—Management Plan (Barr 2014) and associated annual reports (Barr 2015, 2016; Arcadis 2017). The AWS Management Program (Barr 2014) was historically implemented to provide an alternative domestic water supply to the affected and potentially affected community surrounding the Site. Investigation activities were conducted between 2009 and 2016, which included the sampling of approximately 866 private wells for sulfolane. The 2014 AWS Management Program implemented a variety of AWS solutions throughout the area including:

- Interim bottled water delivery or reimbursement. Bottled water was provided through regular deliveries or reimbursements were provided to homeowners who elected to purchase their own bottled water.
- POET systems or wellhead treatment systems. Although POET systems varied to accommodate each property, they typically consisted of a brine tank/water softener, ultraviolet disinfection, and granular activated carbon (GAC) vessels, which were implemented in both simplex and duplex configurations.
- Bulk water storage tanks. A 2,000-gal low profile tank was installed below ground at properties, insulated, and heat traced as necessary. Water deliveries were provided with this option.
- Optional garden water storage tank. A 1,000-gal, aboveground garden tank was provided for residents to water vegetable gardens. Garden tanks were intended for summer use only, and water was provided throughout the growing season.

In addition to providing alternative water supplies to the properties, the 2014 AWS Management Plan included annual sulfolane monitoring, public communications, and AWS O&M. From 2018 through 2020, the City of North Pole expanded its piped water system to include areas impacted by the sulfolane plume and an additional buffer area beyond the plume footprint (ADEC 2023). Of the 746 properties eligible for the city water expansion, 638 water line connections were made, and the remaining 108 properties either did not provide permission (52 properties) or were deemed ineligible because of technical considerations (56 properties) (ADEC 2023).² The properties connected via the expansion project and the 108 remaining properties are identified in Figure 1. Newly connected piped municipal water supplanted the previous AWS options, and the AWS provisions were ended at the close of 2019 (City of North Pole 2023).

The December 2023 Amended Judgment required Williams to prepare this AWS Plan and submit it to ADEC for approval. The provisions for the Williams AWS Plan are discussed herein.

² The Amended Judgment for Injunctive Relief notes that ADEC identified 102 properties. The property evaluation and verification process (Section 3) will confirm and refine these numbers to the extent possible.

3 AWS PROPERTY EVALUATION AND VERIFICATION

A comprehensive property evaluation and the verification of historically collected property information will be needed to support the identification and screening of properties for AWS. These activities will provide the information that will be used to determine the appropriate AWS provisions for each affected property.

3.1 PRIVATE WELL DATABASE

Historical efforts to address private well impacts included the creation of a private well database by FHRA. The purpose of the database was to house and compile information related to private wells within or near the sulfolane plume. That database was the key source of information to track AWS status and project progress. The private well database became fully operational in the fourth quarter of 2013 and was maintained by FHRA until the termination of FHRA's AWS Management Program at the end of 2019. Information in the database included:

- Well owner and contact information
- Access and other agreements
- AWS remedy implemented and current status
- Interim bottled water service information
- Well sampling results
- AWS O&M schedules.

The FHRA database was provided to Williams in March 2019. Additional information for the database regarding connection status was provided by ADEC in August 2023.

A key component of this AWS Plan will be the creation of an electronic database to track private well information. The creation of that database will begin with a comprehensive review and verification of the information contained within the existing private well database. Moving forward, that data will be built upon and revised as additional relevant information is obtained.

Information gathered will include the results of property screening activities, annual “windshield” surveys of properties performed to identify land use changes (e.g., new construction), information obtained from the City of North Pole through public record requests, and data from the Fairbanks North Star Borough parcel database. Those property screening activities are further detailed in Section 4.1. This property database will also be used to track contact attempts at individual properties and sampling activities. The creation and maintenance of that database will be performed by the field support subcontractor Shannon &

Wilson. Updates to the database will be provided to ADEC on an annual basis coinciding with the annual reporting discussed in Section 6.

3.2 SCREENING LEVELS

The Amended Judgment notes that this AWS Plan is required to address any property with sulfolane detections between 2017 and the present that is not connected to piped water. The detection limit can vary; however, typical laboratory detection limits for sulfolane in recent years have been in the range of 3 to 4 µg/L. In the future, ADEC may set a Site-specific cleanup level for sulfolane. As laid out in the Amended Judgment in Section 1 (e), a Site-specific screening level may be promulgated in the future in response to ongoing studies by the National Toxicology Program; when available, such a value would become the appropriate screening level.

3.3 PLUME EXTENT

The extent of the sulfolane plume is defined, for the purposes of this AWS Plan, as the area containing wells with a detection of sulfolane from 2017 to the present (Figure 2).³ The build-out of the piped water system in North Pole extends past the extent of the plume, providing a substantial existing buffer area in the direction of groundwater flow (Figure 2). The plume extent will be evaluated each year as part of the offsite sulfolane plume monitoring.⁴ The plume extent will be included in annual AWS reporting to evaluate the ongoing effectiveness of the existing piped water system.

3.4 AWS VERIFICATION ACTIVITIES

Williams will utilize several methods to characterize impacted properties, identify associated wells, and verify information in the private well database in accordance with the Amended Judgment. The properties not yet connected to municipal water within the sulfolane groundwater plume area will be the focus of verification activities (Table 1). The purpose of these verification activities will be to identify:

- Changes in the presence and/or use of wells

³ PW-0277 (3 µg/L, J-qualified, in 2017) and MW-328-151 (3.96 µg/L, J-qualified, in 2019) had low-level estimated value detects outside the main plume. Given the series of more recent non-detects, the low estimated values, and the numerous surrounding non-detects, there is uncertainty as to whether the plume fully extends to these locations.

⁴ The 5-Year Characterization Study and Work Plan (5-Year Work Plan) presents the offsite monitoring to occur in the period from 2024 to 2028. The sharing of the sulfolane plume boundary between the 5-Year Work Plan and the AWS represents one of multiple information sharing points.

- Existing AWS (e.g., use of bottled water, bulk water delivery, POET)
- Changes in well condition and construction
- Current sulfolane concentrations.

Verification activities will include windshield surveys, notification of upcoming activities, and the property survey. These verification activities will be repeated on an annual basis.

The 2024 windshield survey was completed from April 11 to 15, 2024. That survey involved visiting each property and performing a visual inspection to ascertain land use type (e.g., residential, commercial, undeveloped), the status of the property (e.g., in use, vacant, seasonal use only), and general observations of the condition and characteristics of the property. That information is summarized in Table 1.

The next step of the verification activities is the notification of upcoming activities. This will include the distribution of flyers or mailers to inform residents and property owners of upcoming telephone or in-person contact attempts. This distribution will provide basic information on the planned dates of further survey activities, the purpose of the survey activities, and contact information for those residents with questions or concerns. A copy of that flyer/mailer is provided as Appendix A. In addition, Williams will coordinate with the City of North Pole to update information on the City's website.

The last component is a property-by-property survey of each of the 108 properties. Three contact attempts will be made per year in approximately March, June, and September. These contact attempts can include door knocking, phone calling, and distribution of flyers or letters. Initially this survey will involve attempts to contact and collect groundwater samples at all 108 properties that were not connected and that have wells. The survey will have as highest priority the properties that are both residential and currently occupied as determined by the windshield survey. This subset of properties will be individually visited in person to obtain information on the condition/use of private wells (Appendix B) and to obtain water samples. The in-person survey personnel will be prepared to collect water samples at the time of the visit or will schedule a later time, as preferred by the resident or owner. The secondary focus of the survey activities will be properties that are commercial, not in use, or of uncertain status. The owners of those properties will be contacted via telephone to ascertain current or planned future domestic water use, well status, and property status. The purpose of this screening will be to identify properties that may utilize groundwater containing detectable sulfolane. If that telephone contact identifies a private well and the owner agrees to sampling, a sample collection date will be set.

The results of the samples collected as part of this effort will be compiled and reported in the annual AWS report and the offsite sulfolane plume report. Results will also be provided to the

residents with 4 weeks of receipt. Those analytical results will be provided, via email, to ADEC within 2 weeks of receipt. All information on property uses and status compiled as part of these survey efforts will be compiled in the private well database. In addition, the compiled access agreements, requests for no further contact, and other pertinent information for future activities will be recorded in the private well database.

An annual search will be conducted for any new private wells that may have been added within the sulfolane plume (e.g., new construction) or that ADEC or Williams were not otherwise aware of. In the absence of a comprehensive well regulation and tracking system at the local or state level, this effort will utilize existing resources. The first component of the new well search will be the windshield survey to identify changes in land use and property development. This windshield survey will be followed by a review of aerial photographs to identify parcels that have visible changes. Information regarding those properties with changes will be obtained from the City of North Pole through public records requests. This will include utility records (to identify properties with water and/or sewer connections), land use records (to identify building permits or land development permits), and other city records associated with specific properties. Last, the Fairbanks North State Borough parcel database will be reviewed annually to identify changes in property ownership, zoning status, or valuations that may indicate notable changes.

Multiple methods will be used to attempt to confirm the presence of new wells at those properties identified in the new well search process. This will include mailers, telephone calls to property owners, and in-person visits to newly identified addresses. Relevant private well information will be collected upon contact with the owner or during visual inspections. If new private wells are identified, they will be incorporated into the private well database and sampled, if allowed by the property owner.

4 AWS PROGRAM

The purpose of the AWS program is to provide a framework for identifying impacted properties (Section 3), as well as to create a process to determine and implement an AWS solution. The following sections provide a methodology for screening potential properties to determine eligibility, the decision tree to be utilized for selecting the AWS solution, and a description of the possible AWS solutions.

4.1 PROPERTY SCREENING

The first screening step will identify those properties that have the potential for exposure to sulfolane-containing groundwater. Properties that are excluded from further evaluation include those located outside of the plume, those located inside of the plume but connected to municipal water supply, and those inside the plume with non-detect monitoring results for three years and ADEC-approval for removal from the AWS plan. Properties that will be evaluated for a potential AWS remedy will include those located inside of the plume that are not receiving municipal water due to technical infeasibility or refusal to connect or that are a previously unassessed property and have detected concentrations of sulfolane. Over time, additional properties may be identified through evaluation and verification activities discussed in Section 3. In addition, as noted in the 5-Year Characterization Study and Work Plan (Integral 2024) sampling and monitoring activities completed as part of that plan may identify additional properties requiring AWS. Those properties will be incorporated into the AWS program.

A visual representation of the property screening decision tree is provided in Figure 3.

4.2 AWS IMPLEMENTATION

Properties identified for further evaluation through the initial property screening will be assessed for AWS implementation as shown in the AWS decision tree (Figure 4). The AWS decision tree provides a clear, straightforward process for identifying AWS-related actions.

The first step is dependent on the willingness of the property owner to allow for access to evaluate the property for an AWS remedy. Each year three attempts will be made to contact the property owner for permission to access their property. These contact attempts may include mailings, telephone calls, or in-person contact attempts. If the property owner allows access, an evaluation will commence for the implementation of an AWS. These implementation steps are further discussed below. Properties that refuse AWS or do not respond to contact attempts are “opt-outs,” implementation steps for opt-outs are discussed in Section 4.2.5.

The following section outlines the AWS activities that will be performed for each AWS. This includes a description of the AWS, O&M, annual activities and monitoring, and criteria for cessation of the provision of the AWS. AWS options are presented in approximate order of decreasing protectiveness and include piped water, POET systems, bulk water, bottled water, and finally, AWS opt-outs.

4.2.1 Piped Water

As noted in Section 2, previous activities have included expanding the municipal water system to provide a permanent AWS to affected properties. However, a number of properties either refused a connection or were deemed infeasible to connect to the municipal supply (Table 1; ADEC 2023). Any property undergoing evaluation under the new AWS Plan will be first assessed for a potential connection to the municipal water network. For those properties that refused connection or were infeasible to connect, property evaluation and verification activities will include questions about current opinions regarding the connection of municipal water supplies. If these properties are interested in connection, technical feasibility will be re-evaluated in the context of current conditions.

Migration of properties from private wells to the municipal water supply is the preferred and most protective AWS remedy as it is permanent and requires no future O&M. This assessment is in agreement with a previous November 2018 advisory by ADEC informing residents that connection to the municipal water service will protect the owner and anyone else on the property from any health effects that could be caused by exposure to contaminated well water (ADEC 2018).

To the extent possible, new water line connections will be coordinated in groups of properties to minimize the disturbance of construction phases. Water line expansions will be performed in close coordination with the City of North Pole and ADEC to satisfy all local and state code requirements. A POET system may be required if a property connection is refused or deemed technically infeasible (e.g., structures that do not meet code requirements). Additionally, a temporary POET system may be offered in the interim until a permanent water line connection is installed. Bottled water will be offered as a temporary solution in the short term while a temporary POET or water line connection is completed. This bottled water will be offered immediately to residents qualifying for an AWS.

The provision of piped water is a permanent solution and will not require O&M activities.

After the installation of piped water, the AWS Plan at these properties will be discontinued. No further contact will be necessary.

4.2.2 POET Systems

POET systems are typically installed indoors where the existing water utility services are located and provide treated water for the whole property. The primary treatment apparatus for sulfolane constituents will be two GAC tanks installed in a lead-lag configuration, in which water first flows through the lead vessel before flowing through the secondary lag vessel.

The previous 2014 AWS Management Plan included the installation of POET systems at a number of properties within the plume extent. The current AWS Plan will include an inventory and evaluation of existing POETs; this evaluation will determine if the existing POET requires maintenance, optimization, or replacement.

Because of the variability involved with water quality, residential utilities, and building construction, individual POET systems may vary in construction and required process units. Each property will be assessed to determine what POET configuration is best for that property. Typical process units that may constitute a given POET system are as follows:

- Flow meter. A meter is installed in line with the POET system units to measure flow volumes through the system for ongoing O&M.
- Sand and sediment canister filters. Typically, small filters are installed at the front end of the POET or before individual process units to precondition water for treatment. These generally remove dirt and larger debris from the raw well water.
- Water softener/brine tank. An ion exchange resin tank and associated brine tank remove naturally occurring minerals and hardness from the water to prevent potential scaling and fouling of the other process units.
- Ultraviolet filter. The filter uses ultraviolet light to provide disinfection and prevent biological fouling of the GAC vessels.
- GAC filter. Two large filters filled with activated carbon (usually derived from coconut shells or coal), and the GAC vessels remove sulfolane from the water through a process called adsorption.

As needed, a separate insulated shed or structure may be installed to house the POET system components. A heating system or heat-traced lines will be connected to the existing well pump electrical source, which will prevent freezing. If year-round electrical service is not present, the POET system will require seasonal decommissioning at the same time the well pump is decommissioned for overwintering.

A temporary bottled water supply will be offered to residents until a POET is installed. This bottled water will be offered immediately to residents qualifying for an AWS.

POET systems will require long-term O&M to ensure the systems are operating as designed and to minimize system downtime. Typical O&M activities may include any or all of the following tasks:

- Sampling the influent, carbon vessel midpoint, and effluent water
- Replacing filter cartridges in the sand/sediment filters
- Replacing spent salt in the brine tank for the water softener
- Replacing spent ultraviolet bulbs from the disinfection system
- Changing out the GAC lead vessel and switching the order of flow through the lead/lag setup
- Inspecting and servicing the general system, including replacing piping, valves, and other appurtenances as needed.

O&M activities will be conducted on an annual basis at a minimum, or as needed depending on operating conditions at each property. POET O&M will continue until plume monitoring and private well sampling indicate that an exposure risk is no longer present at the property, at which point, the system may be decommissioned. Specific criteria for AWS phase out are described in Section 4.3.

Annual monitoring and contact activities at properties with POET systems will be undertaken as part of the O&M activities for these systems.

4.2.3 Bulk Water

There may be properties that have previously utilized bulk water tanks in the sulfolane plume area. These residents will be evaluated for the provision of an AWS (Figure 4). If the provision of a water line connection or POET is infeasible or refused, the resident will be offered drinking water supplies.

O&M activities for properties using bulk water will consist of the provision of drinking water to the property (amount and frequency determined on a case-by-case basis based on the property owner's water usage and preferences). Drinking water deliveries will continue until plume monitoring and private well sampling indicate that an exposure risk is no longer present at the property, at which point, the provision of drinking water will be stopped. Specific criteria for AWS phase out are described in Section 4.3.

Properties using bulk water will be contacted annually. During this annual contact, property residents will be offered alternative AWS (piped water or POETs) and the opportunity for sampling of private wells.

4.2.4 Bottled Water

As discussed above, bottled water supplies may be provided as a temporary bridge solution while preferred AWS options (piped water or POET systems) are implemented. Bottled water supplies will also be offered to those residents refusing piped water or POET systems. Bottled water will be provided through regular deliveries or reimbursements to homeowners who elected to purchase their own bottled water. Williams is contracting with Spring Alaska to provide bottled water to residents upon notice from Williams.

Bottled water deliveries will continue until plume monitoring and private well sampling indicate that an exposure risk is no longer present at the property, at which point, the provision of bottled water may be stopped. Specific criteria for AWS phase out are described in Section 4.3.

Properties receiving bottled water will be contacted annually. During this annual contact property residents will be offered alternative AWS (piped water or POETs) and the opportunity for sampling of private wells.

4.2.5 Opt-Outs

Opt-out properties can be of two types: “no contact” and “refusal.” No contact opt-outs are defined as those properties that do not respond to contact and outreach activities. Refuse opt-outs are defined as those properties that will not accept the provision of an AWS.

Annual monitoring and contacts of properties that receive or refuse AWS will be needed. The necessary monitoring and activities for the range of AWS outcomes is described below. The activities described below are those specific to the AWS plan. Additional sampling and monitoring will occur in accordance with the 5-Year Characterization Study and Work Plan (Integral 2024).

4.2.5.1 No Contact Opt-Outs

It is understood that some properties within the affected area may be seasonally occupied, vacant, or otherwise unresponsive. Therefore, a multi-year contact period will be implemented for properties where owner contact is not established. Each year three attempts will be made to contact the property owner for permission to evaluate the property for an AWS remedy. Should a property owner specifically request no further contact, no more attempts will be made. In addition, should a property owner be found to be threatening or otherwise present risks for in-person visits, ADEC will be notified of the circumstances. If ADEC agrees with the security assessment, no further in-person contact attempts will be made.

If after 3 years no response is received or no access is granted, the property will be considered to be a no contact opt-out and may be proposed to be removed from the AWS Plan. Properties

authorized for removal from the AWS Plan by ADEC will require no further action; properties not authorized for removal by ADEC will be addressed with action determined in consultation with ADEC. All properties removed from the AWS Plan as no contact opt-outs will be provided notification of their removal and information regarding Site groundwater contamination.

Properties excluded from the AWS Plan as no contact opt-outs will be reassessed annually via a review of public records to check for property transactions. If a new owner is identified, attempts to contact the new property owner will be made.

4.2.5.2 Refusal Opt-Outs

Should a property owner contact be established and a refusal to implement an AWS remedy occurs at any point within the AWS decision tree process, the property will be considered to be a refusal opt-out. The owner will be contacted annually for 3 years to confirm their refusal. These opt-outs will be offered annual sampling and will be provided information regarding potential contamination. Should the property owner maintain refusal for 3 years, the property may be proposed to be removed from the AWS Plan. Properties authorized for removal from the AWS Plan by ADEC will require no further action beyond a final notification letter indicating their removal from the AWS Plan. Properties not authorized for removal by ADEC will be addressed with action determined in consultation with ADEC.

Properties excluded from the AWS Plan as refusal opt-outs will be reassessed annually via a review of public records to check for property transactions. If a new owner is identified, attempts to contact the new property owner will be made.

4.3 AWS PHASE OUT

On an annual basis, properties will be screened for AWS Plan phase-out (the discontinuation of the provision of AWS). That potential for phase-out will be evaluated against two criteria. The first criterion will be a decreasing concentration trend as identified by Mann-Kendall trend testing. The second criterion will be 3 or more years of private well sampling below screening levels (Section 3.2). In addition, wells with no trend, but at least 3 years of concentrations below screening levels may be proposed for discontinuation. If a property is qualified for ongoing AWS activities (e.g., bottled water or bulk water), but no longer has a private well for property-specific results, then the Mann-Kendall trend testing for the greater plume footprint will be used to evaluate the potential phase-out.

Properties that meet these criteria will be identified and proposed for discontinuation in the annual AWS report. The provision of AWS will be ended given specific approval of ADEC. Upon approval of discontinuation, owners of these properties will receive a notification letter indicating their removal from the AWS Plan.

4.4 PROPERTY DEVELOPMENT AND OWNERSHIP TRANSFERS

The North Pole area will be monitored annually for property transfers and new development to ensure no new private wells generate a potential exposure risk. This process, involving annual windshield screening combined with a review of changes in property records maintained by the Fairbanks North Star Borough and the City of North Pole, is described in Section 3.4. If a new parcel or structure is developed within the plume area, this will trigger the AWS screening process as shown on Figure 3, and an AWS remedy will be implemented, if required, as shown on Figure 4.

Property transfers will be treated similarly if an AWS remedy is not already in place at the property. The new owner will be contacted, and the property assessed for an AWS remedy (Figures 3 and 4), as permitted by the new owner. Annual monitoring of property transfers and new development will continue until a critical water management area (CWMA) can be established.

5 CRITICAL WATER MANAGEMENT AREA

A CWMA is designated by the Alaska Department of Natural Resources (ADNR). The establishment of a CWMA is governed by 11 AAC 93.500 through 11 AAC 93.540. Williams will petition the Commissioner of ADNR to designate a CWMA that comprises the area impacted by the sulfolane plume (Figure 2).

The proposed CWMA order (per 11 AAC 93.520) will be requested:

1. As necessary to address groundwater contamination by sulfolane and ensure public safety.
2. Will comprise the area of the sulfolane plume (Figure 2) plus a reasonable surrounding area to provide a buffer and to align with existing property and jurisdictional boundaries.
3. Upon designation of the CWMA, the annual offsite sulfolane report will include an evaluation of the continuing need for the CWMA. If that report determines, with the concurrence of ADEC, that sulfolane contamination no longer necessitates the need for the CWMA it be revoked or amended by the Commissioner of the ADNR.

The proposed effect of the order (11 AAC 93.530) will require:

1. Notification be provided to ADNR, ADEC, and Williams upon the installation of a new well or the rehabilitation/reconstruction of the well that was previously abandoned or not used.
2. That properties with new or rehabilitated/reconstructed wells be connected to the piped water supply, and that the well is not connected to the domestic water supply system. If it is not possible to connect to the public water supply, it will be required to install a POET system to treat water for domestic use.

Annual monitoring of property transfers and new development will continue until the CWMA can be established. Once the CWMA takes effect, it will supersede the need for regular monitoring of new private wells.

6 REPORTING

Williams will provide an annual summary report of all AWS-related activities to ADEC within the first quarter of the following year. Reports will include the following elements:

- A summary of the status of each AWS property
- A compilation of newly installed piped water connections
- Sampling and monitoring results for private wells and installed POETs
- A summary of GAC usage, flow rate, and operational parameters of POETs
- A compilation of the amount and location of bulk and bottled water deliveries
- Major complaints, service visits, problems, or deviations from the AWS Plan
- A discussion of any significant updates or changes to the AWS program
- Identification of properties or areas referred for the provision of AWS based upon annual monitoring as part of the 5-year Characterization Study and Work Plan (Integral 2024).

The annual report will include maps depicting the current extent of the groundwater plume and the location of all properties under the AWS Plan. In addition, sample results letters will be prepared and presented to property owners detailing any data collected for private wells and/or POET systems. Copies of letters will be submitted to ADEC within the annual report.

7 SCHEDULE

The anticipated schedule for AWS-related deliverables and activities is as follows:

- **Summary of AWS Survey**—As outlined in the Amended Judgment, a survey is required of the 108 addresses not connected to the piped water system. The results of this survey are to be provided to ADEC by June 30, 2024. This task assumes that a summary of activities completed and those outstanding, with estimate of completion time, will be provided to ADEC in conjunction with these results.
- **5-Year Characterization Study and Work Plan**—As outlined in the Amended Judgment, this work plan is anticipated to be submitted to ADEC on May 31, 2024. A component of this work plan will include a discussion of alternative water options and any updates to this AWS Plan.
- **Annual AWS Update Reports**—As outlined in the Amended Judgment, annual reports will be provided within the first quarter of each year. These reports will provide a summary of AWS-related activities conducted in the preceding year, sampling results, and other changes or updates to the AWS Plan.

A full detailed list of planned communications and deliverables associated with the AWS plan is provided in Table 2.

8 REFERENCES

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Figures

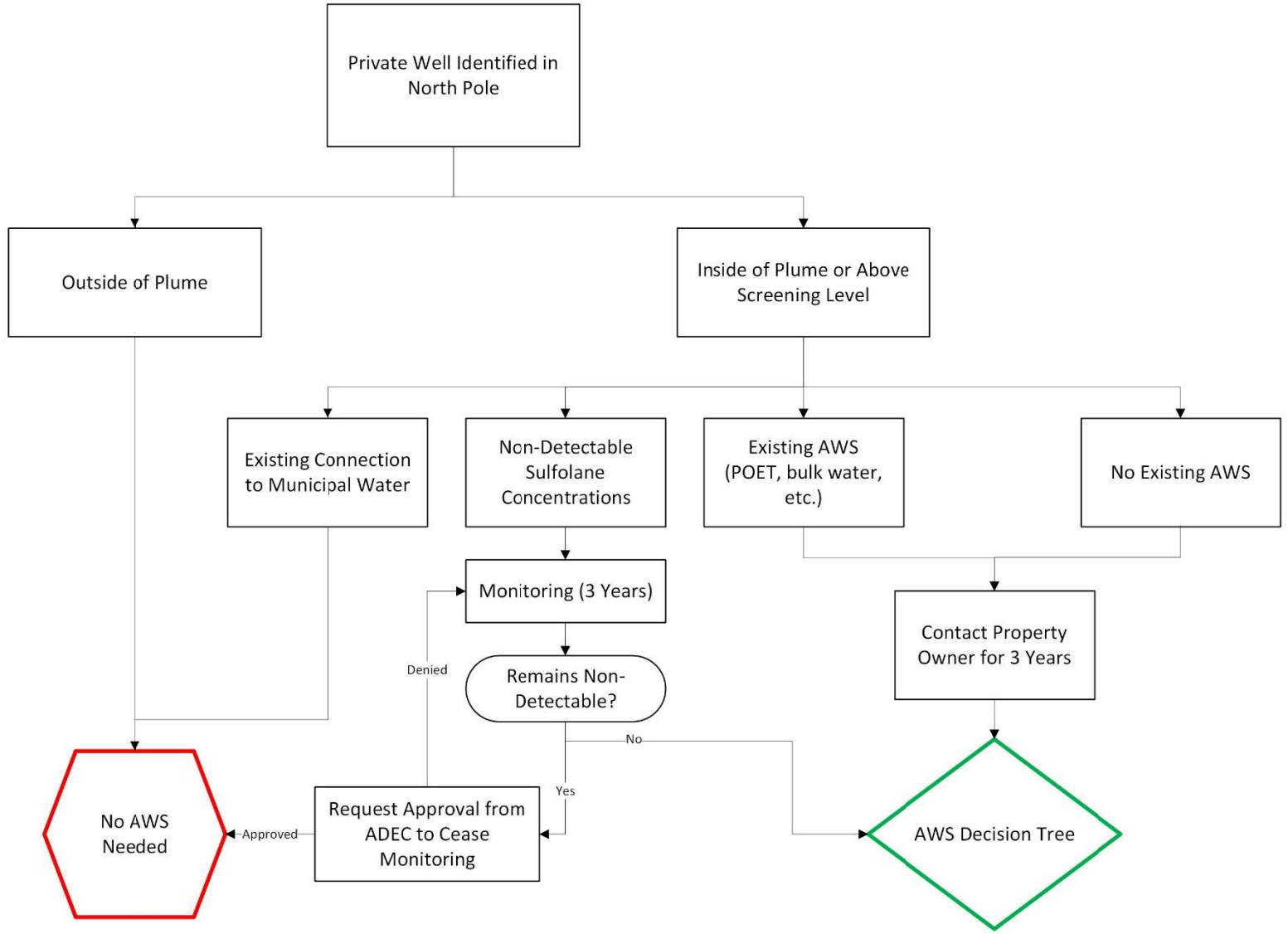


Figure 3.
Property Screening Decision Tree

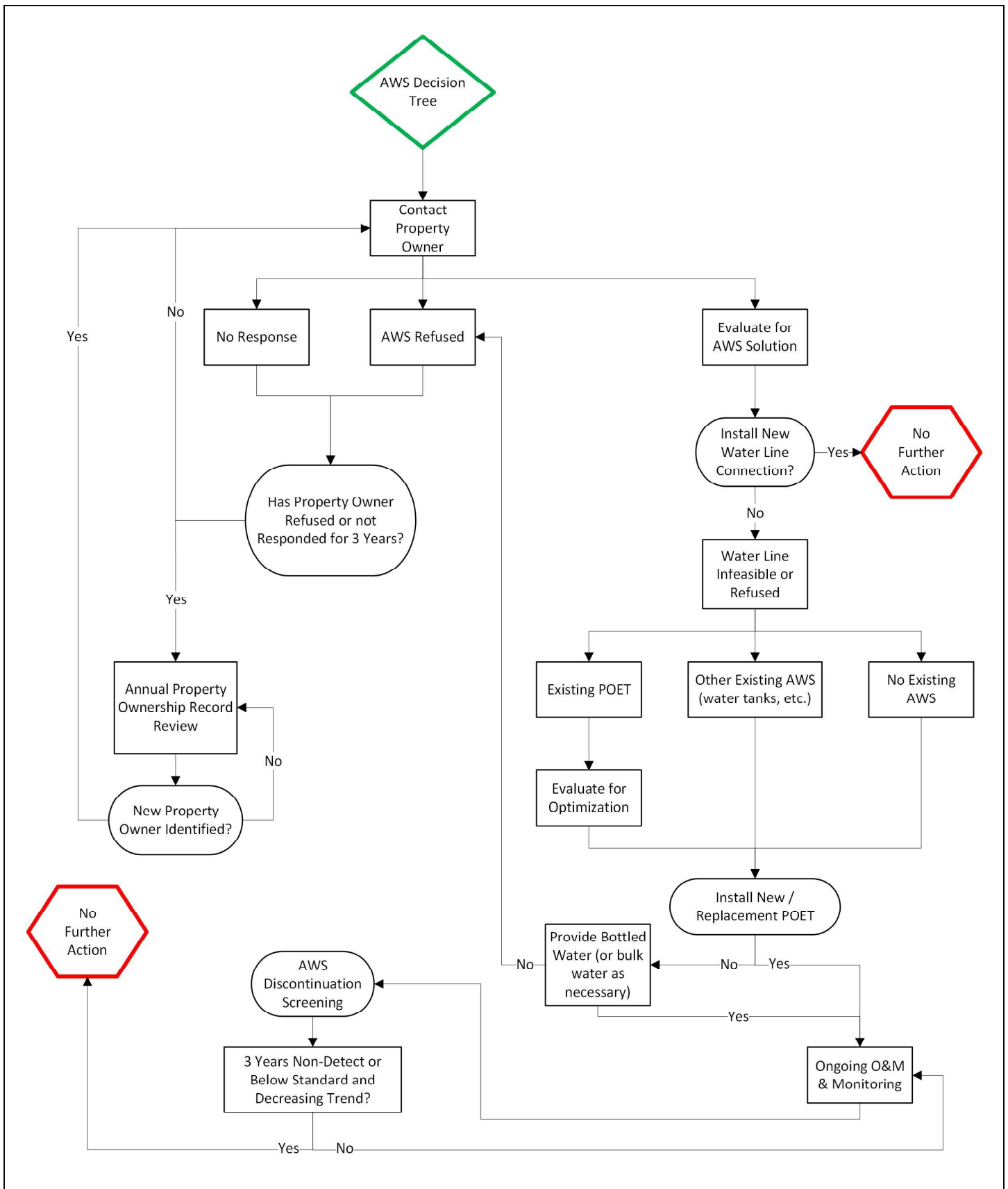


Figure 4.
AWS Decision Tree

Tables

Table 1. Status and Description of Properties that Declined or Refused Connection

Pan	Status	Physical Address	Approximate Coordinates		Associated Private Wells	2024 Windshield Survey Results		Contact Plan for 2024
			X	Y		Inferred Use Type	Property Observations (2024)	
508675	Properties that Declined Connection	2299 PERIDOT ST	-147.377079	64.764008		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
579025	Properties that Declined Connection	2235 PERIDOT ST	-147.384260	64.766307		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
610324	Properties that Declined Connection	2710 HURST RD	-147.371591	64.765411		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
574651	Properties that Declined Connection	765 FINELL DR	-147.373180	64.761668		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
328022	Properties that Declined Connection	2035 LARIX DR	-147.386868	64.776467	PW-0604	Unknown	Unknown	Verify property use and well information by contacting owner
315231	Properties that Declined Connection	2054 PERIDOT ST	-147.375300	64.775400	PW-1464	Residential	Occupied	In-person canvassing
579033	Properties that Declined Connection	2265 PERIDOT ST	-147.378291	64.765715		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
316229	Properties that Declined Connection	2277 EVANS ST	-147.401798	64.765464	PW-0496	Residential	Unoccupied	Verify property use and well information by contacting owner
327875	Properties that Declined Connection	2305 PERIDOT ST	-147.375007	64.763769		Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
429643	Properties that Declined Connection	2358 PIPER ST	-147.398390	64.761752	PW-1094	Vacant	Vacant Land	Verify property use and well information by contacting owner
327964	Properties that Declined Connection	2380 RICHARDSON HWY	-147.393649	64.767111		Residential	Occupied	In-person canvassing
316237	Properties that Declined Connection	2413 LOOMIS DR	-147.402072	64.765338		Residential	Unoccupied	Verify property use and well information by contacting owner
287105	Properties that Declined Connection	2417 GRUMMAN ST	-147.395322	64.759179		Residential	Unoccupied	Verify property use and well information by contacting owner
315877	Properties that Declined Connection	2427 LOOMIS DR	-147.400596	64.765431	PW-0481	Residential	Unoccupied	Verify property use and well information by contacting owner
315842	Properties that Declined Connection	2437 LOOMIS DR	-147.399613	64.765435	PW-0478	Residential	Occupied	In-person canvassing
430099	Properties that Declined Connection	2484 BOULDER AVE	-147.394986	64.778295		Unknown	Unknown	Verify property use and well information by contacting owner
430030	Properties that Declined Connection	2509 BOULDER AVE	-147.392100	64.777200	PW-1115	Residential	Unoccupied	Verify property use and well information by contacting owner
406431	Properties that Declined Connection	2559 BOULDER AVE	-147.386724	64.777196	PW-1058	Residential	Occupied	In-person canvassing
290696	Properties that Declined Connection	2575 PERIMETER DR	-147.383801	64.755590	PW-0228	Residential	Occupied	In-person canvassing
315087	Properties that Declined Connection	2601 GOLDENROD CIR N	-147.381700	64.775400	PW-0451	Residential	Unoccupied	Verify property use and well information by contacting owner
315109	Properties that Declined Connection	2618 GOLDENROD CIR S	-147.380550	64.774667	PW-0452	Residential	Occupied	In-person canvassing
315257	Properties that Declined Connection	2695 GOLDENROD CIR N	-147.373115	64.775473		Residential	Unknown	Verify property use and well information by contacting owner
315184	Properties that Declined Connection	2714 GOLDENROD CIR N	-147.370361	64.776440	PW-0462	Residential	Unknown	Verify property use and well information by contacting owner
326704	Properties that Declined Connection	1786 WILLEDA ST	-147.392500	64.787400	PW-0591	Residential	Occupied	In-person canvassing
303798	Properties that Declined Connection	1807 SARAH LEE LN	-147.391899	64.786699	PW-0382	Residential	Occupied	In-person canvassing
303852	Properties that Declined Connection	1850 WILLEDA ST	-147.392291	64.784755	PW-0386	Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
303992	Properties that Declined Connection	1909 KOONZ DR	-147.391025	64.782008		Residential	Occupied	In-person canvassing
316598	Properties that Declined Connection	2048 KIMI ST	-147.355226	64.775602	PW-0510	Residential	Occupied	In-person canvassing
296236	Properties that Declined Connection	2450 MARIGOLD RD	-147.398830	64.792398	PW-2226	Residential	Occupied	In-person canvassing
459151	Properties that Declined Connection	2473 LIONS RD	-147.395010	64.783763	PW-1170	Residential	Occupied	In-person canvassing
459151	Properties that Declined Connection	2475 LIONS RD	-147.395059	64.783595	PW-1170	Residential	Occupied	In-person canvassing
459151	Properties that Declined Connection	2477 LIONS RD	-147.395076	64.783424	PW-1170	Residential	Occupied	In-person canvassing
298581	Properties that Declined Connection	2489 BADGER RD	-147.395866	64.795868		Residential	Occupied	In-person canvassing
295906	Properties that Declined Connection	2509 BADGER RD	-147.393307	64.794600		Residential	Occupied	In-person canvassing
303879	Properties that Declined Connection	2532 LIONS RD	-147.389770	64.784510		Residential	Occupied	In-person canvassing
406333	Properties that Declined Connection	2549 DILLON AVE	-147.387500	64.780300	PW-1053	Residential	Occupied	In-person canvassing
326691	Properties that Declined Connection	2585 TOPAZ AVE	-147.384100	64.780800	PW-0590	Residential	Occupied	In-person canvassing
326640	Properties that Declined Connection	2605 BADGER RD	-147.388919	64.788417		Vacant	Vacant land	Verify property use and well information by contacting owner
383716	Properties that Declined Connection	2734 SALMON CT	-147.368424	64.790751		Residential	Occupied	In-person canvassing
301973	Properties that Declined Connection	2775 HORSESHOE WAY	-147.353568	64.767805	PW-0350	Residential	Occupied	In-person canvassing
317861	Properties that Declined Connection	2786 GARNET DR	-147.363315	64.782973		Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner
317888	Properties that Declined Connection	2806 GARNET DR	-147.360674	64.782210		Vacant	unknown	Verify property use and well information by contacting owner
316652	Properties that Declined Connection	2875 COHELLE AVE	-147.352800	64.773500	PW-1930	Residential	Occupied	In-person canvassing
318213	Properties that Declined Connection	2890 BADGER RD	-147.368600	64.778200	PW-0570	Residential	Occupied	In-person canvassing
302422	Properties that Declined Connection	3182 BADGER RD	-147.343500	64.768400	PW-0367	Residential	Occupied	In-person canvassing
302422	Properties that Declined Connection	3184 BADGER RD	-147.343100	64.768200	PW-0368	Residential	Occupied	In-person canvassing
326321	Properties Infeasible to Connect	1635 POODLE LN	-147.421253	64.794472		Residential	Occupied	In-person canvassing
296007	Properties Infeasible to Connect	1642 WOLL RD	-147.409519	64.793810		Unknown	Unoccupied/Derelict	Verify property use and well information by contacting owner

Table 1. Status and Description of Properties that Declined or Refused Connection

Pan	Status	Physical Address	Approximate Coordinates		Associated Private Wells	2024 Windshield Survey Results		Contact Plan for 2024
			X	Y		Inferred Use Type	Property Observations (2024)	
326381	Properties Infeasible to Connect	1673 POODLE LN	-147.421478	64.792555		Residential	Unoccupied	Verify property use and well information by contacting owner
326402	Properties Infeasible to Connect	1674 POODLE LN	-147.419600	64.792400	PW-2210	Residential	Occupied	In-person canvassing
384020	Properties Infeasible to Connect	1839 BONA ST	-147.368325	64.785171		Residential	Occupied	In-person canvassing
391514	Properties Infeasible to Connect	1997 PERIDOT ST	-147.376766	64.777819	PW-0939	Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
316580	Properties Infeasible to Connect	2040 KIMI ST	-147.355406	64.775954	PW-0509	unknown	Unoccupied/Derelict	Verify property use and well information by contacting owner
328081	Properties Infeasible to Connect	2051 LARIX DR	-147.385283	64.775984		Unknown	Unknown	Verify property use and well information by contacting owner
594427	Properties Infeasible to Connect	2123 SAND LOT CT	-147.425945	64.768629		Commercial - In-Use	Developed land, no structure	Verify property use and well information by contacting owner
326411	Properties Infeasible to Connect	2220 OWNBY RD	-147.422378	64.791602		Residential	Occupied	In-person canvassing
685934	Properties Infeasible to Connect	2259 SCHUT RD	-147.408809	64.787444		Residential	Occupied	In-person canvassing
685934	Properties Infeasible to Connect	2269 SCHUT RD	-147.407829	64.787414		Residential	Occupied	In-person canvassing
315907	Properties Infeasible to Connect	2282 EVANS ST	-147.401190	64.765104	PW-1494	Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
328006	Properties Infeasible to Connect	2282 KEENEY RD	-147.409245	64.765165	PW-0603	Residential	Occupied	In-person canvassing
395854	Properties Infeasible to Connect	2305 ICEBERG CT	-147.396618	64.764066	PW-0989	Unknown	Developed land with structure	Verify property use and well information by contacting owner
395919	Properties Infeasible to Connect	2307 HOLLAND AVIATION ST	-147.393878	64.764048	PW-0993	Residential	Occupied	In-person canvassing
328448	Properties Infeasible to Connect	2308 KEENEY RD	-147.410613	64.763836	PW-0626	Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
395901	Properties Infeasible to Connect	2315 HOLLAND AVIATION ST	-147.393455	64.763507		Residential	Occupied	In-person canvassing
395871	Properties Infeasible to Connect	2318 ICEBERG CT	-147.395125	64.763479	PW-0990	Unknown	unknown	Verify property use and well information by contacting owner
290343	Properties Infeasible to Connect	2370 OLD RICHARDSON HWY	-147.380677	64.762625		Residential	Unoccupied	Verify property use and well information by contacting owner
316199	Properties Infeasible to Connect	2390 LOOMIS DR	-147.404652	64.765967	PW-0494	Vacant	Vacant Land	Verify property use and well information by contacting owner
316253	Properties Infeasible to Connect	2407 LOOMIS DR	-147.402809	64.765417	PW-0497	Residential	Occupied	In-person canvassing
316032	Properties Infeasible to Connect	2415 BURTIS AVE	-147.401908	64.764608	PW-0486	Residential	Unoccupied	Verify property use and well information by contacting owner
316016	Properties Infeasible to Connect	2425 BURTIS AVE	-147.401095	64.764642		Residential	Occupied	In-person canvassing
316440	Properties Infeasible to Connect	2432 LOOMIS DR	-147.400207	64.765960	PW-0500	Residential	Occupied	In-person canvassing
315940	Properties Infeasible to Connect	2438 BURTIS AVE	-147.399891	64.765019		Associated parcel	Developed land with structure	Verify property use and well information by contacting owner
315834	Properties Infeasible to Connect	2441 LOOMIS DR	-147.399186	64.765303		Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
315991	Properties Infeasible to Connect	2450 LOOMIS DR	-147.398600	64.765833		Residential	Occupied	In-person canvassing
328936	Properties Infeasible to Connect	2469 HOMESTEAD DR	-147.376803	64.756216		Storage	Developed land with structure	Verify property use and well information by contacting owner
296295	Properties Infeasible to Connect	2475 MARIGOLD RD	-147.395552	64.791738		Residential	Occupied	In-person canvassing
296112	Properties Infeasible to Connect	2486 COLUMBINE DR	-147.394296	64.792954		Residential	Occupied	In-person canvassing
429953	Properties Infeasible to Connect	2514 MILLIE CT	-147.391316	64.779160		Residential	Unoccupied	Verify property use and well information by contacting owner
429937	Properties Infeasible to Connect	2515 DILLON AVE	-147.391301	64.780160	PW-1110	Residential	Unoccupied	Verify property use and well information by contacting owner
296660	Properties Infeasible to Connect	2521 MARIGOLD RD	-147.391156	64.791674		Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner
295868	Properties Infeasible to Connect	2530 MARIGOLD RD	-147.390277	64.792224		Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
406261	Properties Infeasible to Connect	2560 BOULDER AVE	-147.386997	64.777941		Vacant	Vacant Land	Verify property use and well information by contacting owner
406457	Properties Infeasible to Connect	2565 DILLON AVE	-147.385702	64.780108		Storage	Unoccupied	Verify property use and well information by contacting owner
391557	Properties Infeasible to Connect	2615 BOULDER AVE	-147.380517	64.777161	PW-0942	Residential	Occupied	In-person canvassing
315061	Properties Infeasible to Connect	2629 GOLDENROD CIR N	-147.379073	64.775649		Residential	Unoccupied/Derelict	Verify property use and well information by contacting owner
315028	Properties Infeasible to Connect	2643 GOLDENROD CIR S	-147.378522	64.773714	PW-0449	Residential	Occupied	In-person canvassing
315028	Properties Infeasible to Connect	2643 GOLDENROD CIR S	-147.377962	64.773711	PW-0450	Residential	Occupied	In-person canvassing
317802	Properties Infeasible to Connect	2680 Gamet Dr	-147.373443	64.784310	PW-0542	Unknown	unknown	Verify property use and well information by contacting owner
318124	Properties Infeasible to Connect	2711 REGAL AVE	-147.371255	64.779413		Vacant	Developed land, no structure	Verify property use and well information by contacting owner
302031	Properties Infeasible to Connect	2780 HORSESHOE WAY	-147.355141	64.767254		Residential	Occupied	In-person canvassing
302414	Properties Infeasible to Connect	3196 BADGER RD	-147.342681	64.767661		Residential	Occupied	In-person canvassing
574660	Properties Infeasible to Connect	705 FINELL DR	-147.361150	64.781229	PW-1369	Commercial - In-use	Developed land with structure	Verify property use and well information by contacting owner
608001	Properties Infeasible to Connect	SPEEDWAY TRACK	-147.397403	64.785224	PW-1329	Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner
290319	Properties Infeasible to Connect	2356 OLD RICHARDSON HWY	-147.383185	64.763142	PW-0223	Unknown	Unknown	Verify property use and well information by contacting owner
315036	Properties Infeasible to Connect	2653 GOLDENROD CIR S	-147.377055	64.773736		Residential	Occupied	In-person canvassing
316024	Properties Infeasible to Connect	2419 BURTIS	-147.401538	64.764604		Residential	Occupied	In-person canvassing

Table 1. Status and Description of Properties that Declined or Refused Connection

Pan	Status	Physical Address	Approximate Coordinates		Associated Private Wells	2024 Windshield Survey Results		Contact Plan for 2024
			X	Y		Inferred Use Type	Property Observations (2024)	
326551	Properties Infeasible to Connect		-147.386525	64.784376		Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner
384038	Properties Infeasible to Connect		-147.369639	64.785152		Residential	Occupied	In-person canvassing
326674	Properties Infeasible to Connect	2555 REPP	-147.386567	64.790341		Unknown	Unknown	Verify property use and well information by contacting owner
584096	Properties Infeasible to Connect		-147.361916	64.775888		Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner
594379	Properties Infeasible to Connect	2112 SAND LOT CT	-147.423703	64.768944		Commercial - In-Use	Developed land with structure	Verify property use and well information by contacting owner
594389	Properties Infeasible to Connect		-147.422296	64.768750		Commercial - In-Use	Developed land with structure	Verify property use and well information by contacting owner
459151	Properties that Declined Connection	2469 LIONS RD	-147.395578	64.783864	PW-1170	Residential	Occupied	In-person canvassing
459151	Properties that Declined Connection	2467 LIONS RD	-147.395995	64.783928	PW-1170	Residential	Occupied	In-person canvassing
459151	Properties that Declined Connection	2465 LIONS RD	-147.396450	64.783850	PW-1170	Residential	Occupied	In-person canvassing
528684	Properties that Declined Connection	2402 LOOMIS DR	-147.403444	64.765956		Residential	Occupied	In-person canvassing
626993	Properties that Declined Connection		-147.388879	64.771451		Associated parcel	Developed land, no structure	Verify property use and well information by contacting owner

Table 2. Proposed Schedule of Deliverables and Communications for 2024

Description	Duration ^a	Milepost	Completion Date
Estimated AWS Plan Approval Date	--	--	6/15/2024
Public Notification Coordination with City of North Pole	15	6/15/2024	6/30/2024
Information Flyer Distribution	15	6/15/2024	6/30/2024
Initial Phone/In-person Contacts	30	6/15/2024	7/15/2024
Second Contact Attempts	45	6/15/2024	7/30/2024
Sample Collection Completion ^b	90	6/15/2024	9/13/2024
New Well Search	120	6/15/2024	10/13/2024
Analytical Results to Residents	4 weeks from receipt	Variable	n/a
Analytical Results to ADEC	2 weeks from receipt	Variable	n/a
Revised Table 1 to ADEC	n/a	Quarterly	6/30/2024, 9/30/2024, 12/30/2024
2024 AWS Annual Report	n/a	End of Q1 2025	3/31/2025

Notes:

ADEC = Alaska Department of Environmental Conservation

AWS = alternative water supply

n/a = not applicable

^a Duration in days unless otherwise noted.

^b Sample collection timing dependent upon resident responses and availability

Appendix A

Potable Well Testing Letter



May 2024

Request for Potable Well Testing

Dear Resident:

Williams Alaska Petroleum, Inc. (Williams) is investigating constituents in groundwater at the former Flint Hills Resources Alaska North Pole Refinery (Flint Hills Refinery) and the area beyond the former Flint Hills Refinery boundary. As part of this investigation, residents who may not have connected to the public water system are being contacted.

Shannon & Wilson, on behalf of Williams, will soon contact you to gather information regarding your existing water supply and to collect water samples from drinking water wells to evaluate if certain constituents including sulfolane are found in the groundwater. If you have a private potable well at the above referenced property, we would like to evaluate it as part of this investigation and we are requesting to collect a sample. The potable well sampling will be conducted at no cost to you and a summary of the analytical results will be provided to you.

This information will be used to evaluate your eligibility for connection to the public water supply or the provision of an alternative water supply. It is important that we gather this information and obtain access to your property for the environmental investigation. Shannon & Wilson will contact you via phone or in person to set up a date and time convenient to you for collection of a sample from your well.

Thank you for your assistance in this matter. If you have any questions about remedial activities underway at the Site, please contact the Alaska Department of Environmental Conservation, Contaminated Sites Project Manager, Mr. James Fish at [1-907-451-2117](tel:1-907-451-2117)/James.Fish@alaska.gov. If you have any questions regarding this request, please contact Williams at 1-800-WILLIAMS.

Sincerely,

Williams

Appendix B

Private Well Survey Sheet

Water Supply Well Inventory Survey Form

Date: _____

Parcel: _____ PW ID: _____

Name (Owner): _____

Name (Occupant): _____

Physical Address: _____

Mailing Address: _____

Email Address (optional): _____

Contact Phone Number: (owner) _____ (occupant) _____

Number of persons residing at this location: _____ Adults (18 and over) _____

Years at this residence: _____ Teenagers (13 to 17) _____

Children (12 and under) _____

Period of Occupation: Full-Time Seasonal/Other (Describe) _____

1) From where do you obtain your drinking water?

- a) Water Supply Utility b) Well Water
 c) Water Delivery d) Other _____

2) If you have a water well, please answer the following questions:

a) Where is the well located on the property? _____

b) Is the well in use? Yes No

c) If yes, please check all that apply regarding the usage of your well water:
 Drinking Cooking Gardening Pets Other _____

d) If no, is the well usable, unusable, or properly abandoned?
 Usable Unusable Abandoned Method _____

e) When was the well installed? _____

f) What is the well depth? _____ Do you have the well log? Yes No

g) What is the well diameter? _____

h) What is the well type? Dug Well Driven
 Drilled Unknown

i) Do you have any treatment on your well (e.g. water softener)? Please describe. _____

j) Do you have a treatment system (POET) provided by Flint Hills? Please describe the system and how maintenance is performed. _____

3) Sample Permission

Did Resident provide verbal agreement to sample collection? Yes No