


Sterling Water Works  
38674 Pacer St  
Sterling, AK 99672

 Aardvark Engineering  
PO Box 2135  
Palmer, AK 99645

Annemike Powers  
Municipal Landfill Specialist  
Alaska DEC Solid Waste  
555 Cordova St – First Floor  
Anchorage, AK 99501

19 March 2026

**RE: Sterling Water Works Sewage Solids Monofill Permit Application**

Dear Ms. Powers,

The Sterling Water Works Septage Treatment Plant submits the attached application for a new septage solids monofill permit in Sterling, Alaska. The monofill will support operation of a recently built septage treatment facility (ADEC Permit #: PA-000054). The proposed monofill will be centrally located within the 28-Acre subject parcel on which the septage treatment facility is also located. The subject parcel is located at 37605 Robinson Loop Road, approximately 8 miles East of Soldotna, AK. The legal description for the subject parcel is: THAT PORTION OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER (NE1/4 NW1/4) OF SECTION 9, TOWNSHIP 5 NORTH, RANGE 9 WEST, SEWARD MERIDIAN, KENAI RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA. EXCEPTING THEREFROM DUTCH LANDING SUBDIVISION PART TWO, PLAT NUMBER 98-66.

The proposed monofill site is approximately 320 feet above mean sea level. The Sterling area features generally hilly topography. The cleared approximately 4-acre developed area, which includes the existing septage treatment facility and the proposed monofill location, slopes gently downward toward the northeast. Beyond the developed area to the north and east, the relief transitions to a more moderate slope away from the operations area. The subject parcel is comprised entirely of dry land. With the exception of the developed area, the subject parcel is vegetated with a mixture of spruce, birch and other natural vegetation typical for the area.

Test holes excavated for the treatment facility design and permitting revealed 1-2 feet of organics/silty loam followed by 20 plus feet of poorly graded sand with gravel. The on-site process water well log indicated similar materials down to the 138 foot drilled depth. The well log also recorded a static groundwater level of 86 feet, measured in the fall. Based on previous studies, groundwater flows northwest. There are no domestic wells located on the subject parcel.

Sterling's climate is consistent with Southcentral Alaska's coastal weather patterns. Temperatures range from an average high of 65°F in July to an average low of 10°F in December. Permafrost is not expected on the parcel and no indications of permafrost have been observed during site construction.

The attached permit application consists of the ADEC Sewage Solids Monofill Permit application completed in-full, with supporting documentation and other required information located in the appendices. Sterling Water Works acknowledges all applicable local ordinances and zoning requirements for operating the monofill. The Kenai Peninsula Borough Planning Department has indicated that since this parcel is located outside of city limits, there are no other required permits or authorizations.

I certify, under penalty of perjury, that all of the information and exhibits in this cover letter and application are true, accurate, and complete.

Prepared By:

Andrew Holland, EIT  
Sterling Water Works [Owner]



Signature

3-19-2026

Date

Reviewed/Revised and Approved By:

Jennifer Morigeau, PE  
Aardvark Engineering [Civil Engineer]



**ATTACHMENTS:** Sterling Water Works Sewage Solids Monofill New Permit Application, Rev. 0



# Sewage Solids Monofill Permit Application

Alaska Department of Environmental Conservation  
Solid Waste Program

**DEC Office Only:**

Monofill Name:

Authorization #:

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    Appendix A: Ownership Information

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        2025 Tax Bill

    Appendix B: Sewage Solids Monofill Site Plan

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    Appendix D: Wetlands Information

        USFWS National Wetlands Inventory Map

        US Army Corps of Engineers Wetlands Determination Letter

    Appendix E: Groundwater Flow Information

        Groundwater Flow Map

        Groundwater Flow and Velocity Study Map

    Appendix F: Well Log

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    Appendix I: Monofill Inspection Form

    Appendix J: Sewage Solids Disposal Log

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    Appendix M: Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids

<b>Instructions:</b>
This application is for a new permit or a permit renewal for a monofill for sewage solids from domestic wastewater
In the application, the term <b>“facility”</b> refers to all land, structures, other appurtenances, and improvements on land used for treatment, storage, or disposal of solid waste.
If a required item is not applicable, please explain why. Include all the applicable information for each item regardless if it has been previously submitted. The specific location of information within each submitted document or attachment must also be noted for each item.
<b>The application must be stamped and signed by a registered engineer, in accordance with 18 AAC 60.210(c).</b>
For a new facility or significant change to an existing facility, prepare a draft application with a list of questions and schedule a meeting with the ADEC Solid Waste Program.

<b>Section 1. Property Information</b>			
Facility Name: Sterling Water Works Septage Treatment Plant			
Facility Address: 37605 Robinson Loop Road			
Facility City: Sterling			Facility Zip: 99672
Legal Property Description:			
THAT PORTION OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER (NE1/4 NW1/4) OF SECTION 9, TOWNSHIP 5 NORTH, RANGE 9 WEST, SEWARD MERIDIAN, KENAI RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA. EXCEPTING THEREFROM DUTCH LANDING SUBDIVISION PART TWO, PLAT NUMBER 98-66.			
Section: 9	Township: 5N	Range: 9W	Meridian: SEWARD
General Property Description:			
28-acre parcel in the Robinson Loop area near Sterling, Alaska. Approximately 4-acres cleared and developed for recently built septage treatment plan and proposed monofill location.			
Latitude: 60.543461		Longitude: -150.870731	
Landowner: Andrew Holland		Contact Name: Andrew Holland	
Address: 38674 Pacer St		City: Sterling	State: AK Zip: 99672
Email: swwalaska@gmail.com		Phone: 907-252-6344	

**Section 2. Contact Information****Permit Applicant** (Co. or Entity): **SWW MGMT LLC**Contact Name: **Andrew Holland**Address: **821 N Street Suite 102**City: **Anchorage**State: **AK**Zip: **99501**Email: **swwalaska@gmail.com**Phone: **907-252-6344**

Type of Entity:

Government

Corporation

Other:

State of Incorporation or Registration: **Alaska**Alaska Business License Number: **2185802**IRS Tax ID Number: **10244455****Facility Owner** (if different than applicant): **N/A**

Contact Name:

Address:

City:

State:

Zip:

Email:

Phone:

**Facility Operator** (if different than applicant): **N/A**

Contact Name:

Address:

City:

State:

Zip:

Email:

Phone:

**Agent/Consultant: Aardvark Engineering**Contact Name: **Jennifer Morigeau**Address: **PO Box 2135**City: **Palmer**State: **AK**Zip: **99645**

Email:

Phone: **907-252-8377****Section 3. Fees**

A check or money order for the appropriate fees [listed in 18 AAC 60.700(a) Table E-1] must be submitted with the permit application. If not included, the application will be returned to the applicant.

Submit payment for the first year's annual fee with the initial application for a facility. No fee is required for permit renewal applications; annual fees will be billed each year.

You will be billed separately for time spent reviewing waiver requests.

This application is for a:

New Permit

Permit renewal

#### Section 4. Cover Letter and Certifications

Submit a cover letter with the following information and signature.

1.	A statement indicating you wish to obtain a permit for a sewage solids monofill.
2.	Evidence showing the proposed facility meets the requirements for a sewage solids monofill.
3.	A brief general description of the topography, geology, climate, surface hydrology and groundwater hydrology at the facility.
4.	A statement that you are aware of all applicable local ordinances and zoning requirements, and a list of any other required permits or authorizations.
5.	The applicant must submit a signed copy of the application cover letter.
6.	The applicant must submit a signed copy of the following statement, which may be added exactly as shown in the box below to the cover letter. As an alternative, the applicant may sign this sheet and submit it as an attachment to the cover letter.

**I certify, under penalty of perjury, that all of the information and exhibits in this cover letter and application are true, accurate, and complete.**

Printed Name:	Title:
SEE COVER LETTER	
Signature:	Date:

All applications must be signed as follows per 18 AAC 15.030:

- **Corporations:** A principal executive officer, an officer that is no lower than the level of vice president, or a duly authorized representative who is responsible for the overall management of the project or operation.
- **Municipal, state, federal, or other public entity:** A principal executive officer, ranking elected official, or duly authorized employee.
- **Partnerships:** A general partner.
- **Sole proprietorship:** The proprietor.

**Section 5. Waste Handling and Processing Information**

1. **List the amount of the sewage solids you expect to receive at the facility each year from each source:**

<u>Quantity</u> <input type="radio"/> Tons <input checked="" type="radio"/> Cubic yards	<u>Source/Generator</u>
200.0	Dewatered septage predominately from residential septic systems.
200.0	<b>TOTAL</b>

2. **Check the type(s) of waste processing done at the facility before waste is disposed:**

Dewatering     Composting    Other: \_\_\_\_\_

3. **State which vector attraction reduction method of 40 CFR 503.33 will be met for the sewage solids, and list any laboratory analyses required to meet the requirement.**

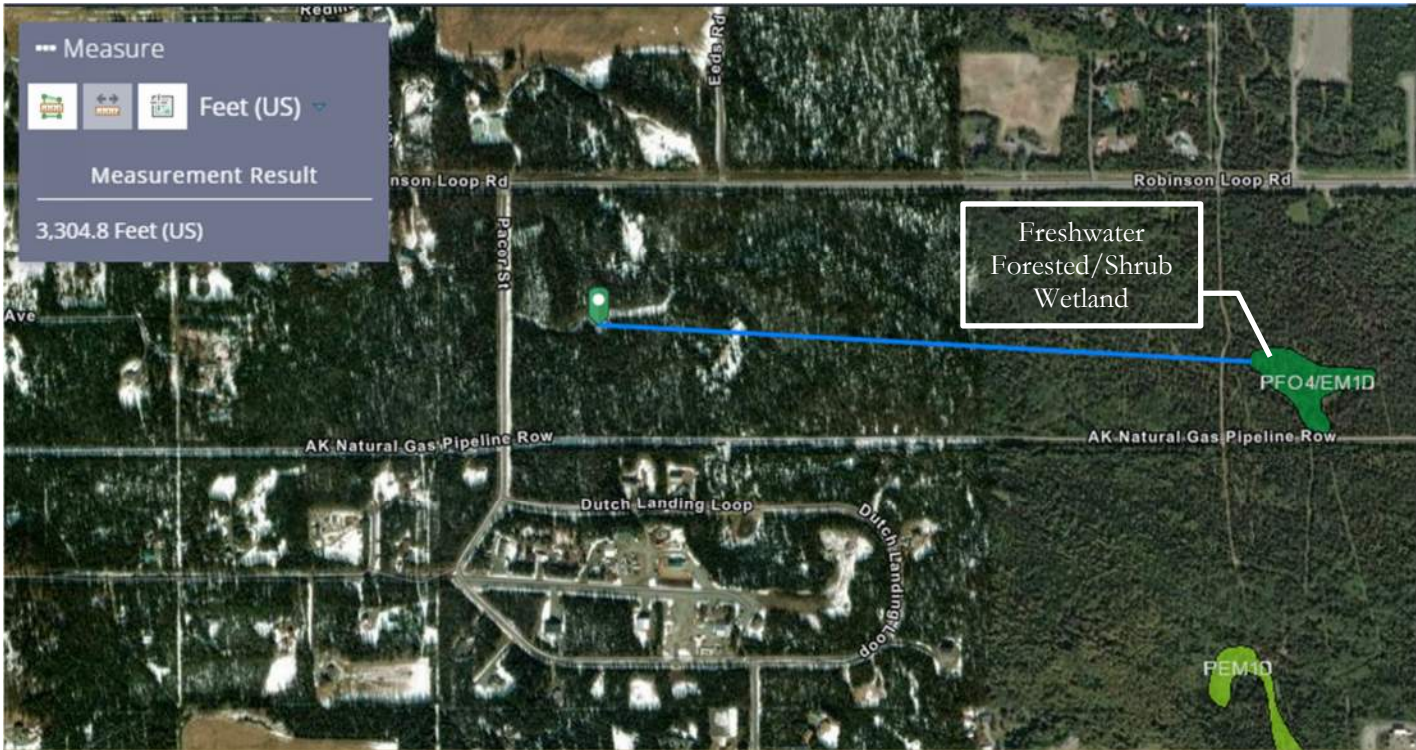
40 CFR 503.33 (b) (11) Sewage sludge placed on an active sewage sludge unit shall be covered with soil or other material at the end of each operating day.  
 No laboratory analyses are required to meet the requirements of this vector attraction reduction method.

4. **If not using the vector attraction reduction method in 40 C.F.R. 503.33(b)(11), state which pathogen reduction method of 40 CFR 503.32 will be met for the sewage solids, and list any laboratory analyses required to meet the requirement.**

N/A

**Section 6. Location Information**

Please identify the PDF page that addresses each requested item.

1.	Property Ownership and Location Information [18 AAC 60.210]	PDF page
	a. Attach a copy of the deed or another legal document that identifies the landowner(s) of the facility.	See Appendix A
	b. If the applicant is not the landowner, attach a written and notarized statement or a copy of any lease agreement signed by the landowner showing that the landowner consents to the facility and placement of a notation to the deed of the property as required by 18 AAC 60.490.	Applicant is the owner. N/A
2. Surface & Storm Water Information [18 AAC 60.210; 18 AAC 60.225; 18 AAC 60.410]		
	a. Distance to nearest surface water body: 3,300	feet
		
	b. Provide information on potential for surface water (storm water or ponds, streams, etc.) to run-on to the facility.	
<p>See site plan in Appendix B for 4' contours. The subject parcel is comprised entirely of dry land. Drainage is typical of rural areas where run-off and run-on water is stored in vegetative buffers, natural swales and isolated low areas. Storm water run on is not expected in designated disposal areas due to the lack of elevation gradient. Additionally, protective berms around each excavation are part of the design to prevent run-on to the monofill cells.</p>		
	c. Provide information on the potential for sediment carried by run-off from the facility to impact nearby surface waters.	No runoff potential
	d. If the facility is located in a floodplain, attach documentation to demonstrate the facility will not restrict the flow of the flood, reduce the temporary storage capacity of the floodplain, and is designed to protect against washout of the solid waste.	Not in a flood plane (Zone X). See App. H

	<p>e. For new facilities or lateral expansion, attach a Wetlands Determination from the U.S. Army Corps of Engineers or information from the National Wetlands Inventory documenting that the area is not designated as wetlands.</p> <p><b>Note:</b> <i>If the new facility or lateral expansion is located in a wetland, you must also complete an ADEC Additional Wetlands Information Form.</i></p>	See Appendix D
<p>3. <b>Groundwater Information</b> [18 AAC 60.040; 18 AAC 60.210; 18 AAC 60.217]</p>		
	<p>a. Attach information documenting the highest measured level of groundwater under the facility. The base of any new unlined cells or lateral expansions may not be located closer than 10 feet above groundwater unless constructed two feet or more above ground surface.</p>	
<p>The process-water well log record in Appendix F indicates a static groundwater level of 86 feet as measured in the fall. The design depth of the monofill excavation is 15 feet below grade as shown in Appendix C. Groundwater flow information is included in Appendix E.</p>		
	<p>b. Annual precipitation:</p>	<p>18.0 inches</p>
	<p>c. Source used to determine annual precipitation: <a href="https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak8727">https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak8727</a></p>	
<p>4. <b>Permafrost Information</b> [18 AAC 60.210; 18 AAC 60.227]</p>		
	<p>a. If the facility is located on permafrost, provide details on why there is not a practical alternative to the location.</p>	No permafrost
	<p>b. If the facility is located in discontinuous permafrost, provide details of what is known regarding the permafrost (e.g. total depth, depth of active zone, areal extent, temperature, etc.).</p>	No permafrost
<p>5. <b>Maps</b>  Attach maps and/or aerial photographs as needed to show the following. You may submit maps that show more than one of the required items. For example, one map can show property boundaries, wetlands, and surface water locations, etc. [18 AAC 60.040; 18 AAC 60.210; 18 AAC 60.410] <u>PDF page</u></p>		
	<p>a. Location of the facility property boundaries.</p>	See Appendix B
	<p>b. Location of surface water bodies and streams within 200 feet of the facility property boundaries.</p>	None See Appendix D
	<p>c. Location of the known or inferred boundaries of permafrost or discontinuous permafrost within 500 feet of the facility property boundaries.</p>	N/A
<p>According to the 2008 Alaska Permafrost Zone Map, the site is located in an “isolated” permafrost zone (0-10%). Permafrost has not been encountered during extensive excavations for development of the septage treatment facility, nor in development of surrounding residential lots. Permafrost is not expected at the site.</p> <p><a href="https://www.arcgis.com/home/item.html?id=4fb081bf8de242d9ada3afbe3bf03684">https://www.arcgis.com/home/item.html?id=4fb081bf8de242d9ada3afbe3bf03684</a></p>		
	<p>d. Location of all drinking water wells within a half mile. There should be no wells within 500 feet of the facility property boundaries.</p>	
<p>See Appendix G for DNR Well Log Map – WELTS with ½ Mile Radius. See Appendix B for site plan showing 500ft separation between “monofil boundary” and nearby residential wells.</p>		
	<p>e. Location of the boundary of any 100-year floodplain in the area.</p>	None See Appendix H
	<p>f. Location of any documented earthquake faults or unstable areas within 200 feet of the facility property boundary.</p>	None shown on Alaska Fault Map

## Section 7. Facility Design

A complete set of design drawings with the following information must be submitted, with drawings included for the design of the facility, as appropriate. Please ensure that the documentation represents the entire facility.

1.	<b>Facility map(s) which show onsite conditions including:</b> [18 AAC 60.210; 18 AAC 60.220; 18 AAC 60.225; 18 AAC 60.233]	<u>PDF page</u>
a.	All previous, existing and planned disposal areas. The map should demonstrate the distance from the disposal cell to the nearest point on the property line; all waste must be at least 50 feet from the facility property boundaries.	See Appendix B
	Monofill will be 164 feet minimum from the property line based on chosen category of pollutant concentration limitations set forth in 18 AAC 60.470 Table B.	
b.	Location of any structures within 500 feet of the disposal cell(s)	See Appendix B
	The wastewater processing building and sewage solids storage building are the only structures within 500 feet of the disposal cells.	
c.	Fences, gates, berms and other access control devices around the facility.	See App. C & B
	<ul style="list-style-type: none"> <li>The wastewater treatment plant has a natural forest (predominately spruce) vegetative buffer around the entire developed area. The buffer between the facility and any public access roadways and trails is no less than 100 feet.</li> <li>A large berm was constructed around the southern and western perimeter of the facility as part of the clearing process.</li> <li>Signage is posted at the singular entry point to the facility that reads: "Septage Disposal Area, Potential Health Hazard". Signage also displays owner name and contact information.</li> <li>Berms will be constructed around the perimeter of the monofill cells as shown on the monofill cell typical details in Appendix C.</li> </ul>	
d.	Access roads to and within the facility.	See Appendix B
	There is only one driveway access to the facility.	
2.	<b>Plan view drawings</b> with contour lines <u>and</u> cross section drawings that show: [18 AAC 60. 210; 18 AAC 60.410; 18 AAC 60.470]	
a.	Any planned excavations before waste cell construction.	None
b.	All roads, ditches, trenches and berms associated with the facility.	See Appendix B
c.	Any planned leachate collection system, including manholes and pump stations.	None
d.	Any planned gas venting or gas collection piping system.	None
3.	<b>Construction detail drawings <u>and</u> cross sections</b> including storm water drainage structures, culverts and other surface water control devices. [18 AAC 60.210; 18 AAC 60.225; 18 AAC 60.410; 18 AAC 60.470]	
a.	As applicable, liner construction details including cover and liner anchors, liner penetrations, etc.	None
b.	Storm water drainage structures, culverts, and other surface water control devices.	See App. B & C
	Surface flow from surrounding areas from rainfall events and snow melt will be redirected from entering the monofill disposal cell using a combination of surface grading and a berm surrounding the excavation. Any surface flow will shed away from monofil area and dissipate in surrounding vegetative buffers.	

4.	<b>Permafrost Design Requirements</b> (if applicable) [18 AAC 60.227]	<u>PDF page</u>
	a. Engineering properties of each earthen layer of ground beneath the facility, including grain size distribution, thaw strain properties, and water content.	N/A
	b. An estimation of maximum thaw depth that is likely to occur beneath the facility and an estimation of the ground deformation that will occur based on thawing.	N/A
	c. Design of engineering features that will be incorporated at the facility to prevent thawing of the ground.	N/A
5.	<b>Design calculations, data and documentation</b> must include the following and supporting calculations. [18 AAC 60.210; 18 AAC 60.227; 18 AAC 60.315; 18 AAC 60.320; 18 AAC 60.410; 18 AAC 60.470]	
	a. Printouts of inputs, assumptions and outputs from any computer model used to support the facility design.	N/A
	b. Information and calculations of the wastes that will be disposed onsite over the usable life of the facility and the maximum design capacity of the facility.	See Appendix K
	<ul style="list-style-type: none"> <li>• Waste will consist only of dewatered septage produced from the associated onsite septage treatment facility.</li> <li>• The proposed monofill design is broken down into two separate cells constructed in two phases to reduce the overall area of the open monofill cell at any given time.</li> <li>• Each cell will consist of a dugout excavation with a usable volume for sewage solids disposal of 1,098 cubic yards and 2 feet of cover for closure. See Appendix C for typical details for the monofill cell.</li> <li>• It is projected that phase 1 will last until the end of the 5 year permit renewal period.</li> <li>• Phase 1 and 2 will be installed parallel to each other with 10 feet of separation between them.</li> <li>• Maximum design capacity for both phases is 2,198 cubic yards.</li> </ul>	
	c. Information and calculations showing how the facility will be protected from any reasonably anticipated natural event such as aufeis, floods, earthquakes, thawing of unstable permafrost, and the effects of freezing and thawing.	N/A
	d. Information and calculations used to estimate the permeability of the liner and the maximum anticipated depth of leachate over any proposed liner.	N/A
	e. A Quality Assurance Plan for the liner installation.	N/A
	f. If located on permafrost, documentation showing that the permafrost will remain frozen to the greatest extent practical.	N/A
6.	<b>Facility Closure Drawings</b> [18 AAC 60.210; 18 AAC 60.470]	
	a. <b>Conceptual drawings</b> of the facility after closure is completed.	See Appendix C

## Section 8. Operations Plan

The operations plan must be a separate document that provides sufficient detail and information that the operator(s) could use it to perform all necessary tasks for day-to-day operation of the facility.

The operations plan is a flexible document that should be reviewed annually and updated as necessary. The following table represents the minimum requirements which must be included. Additional information should be added, as needed, to ensure the facility operates in compliance with all applicable State and Federal and Local Regulations. A copy of the operations plan must be kept at the operating facility.

The requirements outlined in Section 8 of this permit and the responses herein will serve as the source document for the operations plan. Additional information regarding how these requirements will be met is also included in the responses.

1.	<b>Access control</b> [18 AAC 60.210; 18 AAC 60.220]	<u>PDF page</u>
	a. Access to the facility will be controlled using gates, fences, berms or other means of preventing access; hours of operation; signage; and other control measures.	
	<p>The site entrance has posted signage stating “Septage Disposal Facility - Potential Health Hazard”. Signage also lists the business name and phone number.</p> <p>Other deterrents to discourage access include natural spruce forest vegetation and perimeter berms providing physical and visual separation from all nearby public roadways/easements.</p> <p>The site is on private property with “no trespassing” signs posted. No nearby facilities exist which might attract the public such as parks or pathways.</p>	
	b. Access and onsite roads for facility will be kept passable and safe for vehicles during operating months.	
	Access and onsite roads that will be used to access the proposed monofill are maintained for operations within the existing septage treatment facility year-round.	
	c. Prohibited activities, such as target practice or off road vehicle use will be prevented.	
	Site is on private land and is a private facility. No public access is permitted for the prohibited activities listed above. Site is monitored daily for abnormal activity.	
	d. Access and onsite roads will be kept passable and safe for vehicles year round.	
	See 8.1.b.	
2.	<b>Waste acceptance and handling policy</b> [18 AAC 60.210; 18 AAC 60.240; 18 AAC 60.420; 18 AAC 60.470]	
	a. Waste screening procedures to ensure no wastes other than sewage solids are disposed in the facility.	
	Incoming untreated septage is screened at the septage receiving facility for processing. Only dewatered septage will be disposed of in the monofill. This facility is on private land and only trained operators familiar with this permit and the operations plan will be authorized to deposit waste into the monofill. All disposals will be tracked on the disposal event volume tracking log in Appendix J.	
	b. Required signage placed at the facility entrance.	
	See Section 8.1.a.	
	c. Waste processing procedures prior to disposal, including pathogen reduction, vector attraction reduction, and dewatering.	
	Waste processing procedures prior to disposal are covered by ADEC Permit # PA-000054. Septage is dewatered on a filter belt press to approximately 28% solids. The dewatered sewage solids are then stored in a DEC approved covered/contained storage area for up to 1 year where any additional leachate will be collected and reprocessed. This also allows the material to stabilize over time.	

	d. If the waste cell does not include a geomembrane line, include the appropriate pollutant concentration limits and a statement that sewage solids exceeding those limits will not be accepted at the facility.	
	Pollutant concentration limits are determined from 18 AAC 60.470 Table B. Sewage solids with concentrations above those as indicated by the selected boundary distance to property line category listed in this document will not be accepted. See Section 9.5.a for further details regarding pollutant concentration limits and the applicable boundary distance to property line category.	
3.	<b>Waste placement plan</b> [18 AAC 60.210; 18 AAC 60.225]	
	a. Waste placement methods (specific details defining the process).	
	The septage solids storage building located next to the monofill will be emptied each summer using heavy equipment. Dewatered septage may be mixed with other soils to provide a stable working surface if required. Cover material as defined in Section 8.4 will be added at the end of each operating day.	
	b. The planned progression of the working face, including facility development over the life of the facility (diagrams are acceptable).	
	Loads will be dumped at the base of the working face and pushed up the face. Granular soil may be mixed with the waste as necessary in order to stabilize the material.	
	c. How unstable slopes will be avoided.	
	To ensure geotechnical stability, all excavation walls shall be laid back at a maximum slope of 1.5H:1V. The subsurface materials are characterized as silty sand with gravel, which falls under OSHA Type C Soils. This slope adheres to OSHA regulations for the maximum allowable slope for Type C Soils.	
4.	<b>Cover plan</b> - Type of cover material(s) that will be used; for each type of cover describe: [18 AAC 60.210; 18 AAC 60.420]	
	a. Where the cover material will be obtained and stored.	
	In most cases, the cover material will be a soil cover. The soil cover material will be sourced from excavated soils from the monofill digout. For short term (< 72 hours) coverage between operating days, a durable plastic covering secured on all edges may be used.	
	b. The frequency with which the cover will be applied to control litter, odor, and nuisances.	
	In accordance with Section 5.3, the cover material will be applied at the end of each operating day.	
	c. The depth of cover that will be applied.	
	Soil cover material depth shall be 12 inches minimum at the end of each operating day, and 24 inches minimum for final closure.	
5.	<b>Surface &amp; Storm Water Control Plan</b> [18 AAC 60.225]	
	a. Describe how run-off from the facility will be controlled and evaluated to ensure that all waste and leachate remains onsite and does not pollute any surface water	
	Leachate placed inside the monofil does not have the ability to run offsite as it will be contained in the monofill cell excavation. The monofill cell design limits septage solids fill to a minimum of 2' below surrounding existing grade.	
	b. Describe how run on water will be controlled to reduce production of leachate.	
	Run-on water will be diverted using berms/dikes around the perimeter of the excavation and by establishing and maintaining appropriate grade throughout the surrounding area.	

	c. Include any additional related permitting or water quality monitoring requirements.	
	Remove all ponded water that is in contact with waste within seven days after the formation of the pond per 18 AAC 60.225 (b)(1).	
6.	<b>Litter, vector and nuisance control plan</b> [18 AAC 60.210; 18 AAC 60.230; 18 AAC 60.233; 18 AAC 60.420; AS 46.06.080]	<u>PDF page</u>
	a. Describe procedures to ensure wildlife and domestic animals do not endanger the public or facility staff, are not harmed by contact with the waste, and do not become a nuisance.	
	Wildlife and domestic animals will be protected from exposure via compliance with the cover plan of Section 8.4.	
	b. Explain how dust, odor, noise, traffic, litter, disease vectors and other effects will be controlled so they do not become a nuisance or hazard outside of the facility boundary.	
	The facility is centrally located on a 28-acre parcel with a large natural forest buffer. The surrounding area is rural residential, with properties that commonly support activities such as equipment operation and other noise-generating uses. Considering monofill disposals will only be made a few days per year, it is not expected that any of these items will become a nuisance or hazard outside of the facility boundary. Dust will be controlled with watering if necessary. Traffic to and from the site will not be increased. Odor and disease vectors will be controlled by the cover material. Noise from heavy equipment during a disposal event will be short-term and nothing unusual for the area. Any reports or evidences of nuisances will be recorded in the inspection checklist as a potential deficiency and, if necessary, addressed as described in Section 8.7.b and 8.7c.	
7.	<b>Corrective action plan</b> – Describe the actions for: [18 AAC 60.210; 18 AAC 60.800]	
	a. Cleaning up any improper or unauthorized waste disposal	
	In the event that sewage solids for disposal do not meet the testing criteria of this permit, they will remain in the containment of the sewage solids storage building and be re-tested. If the unsatisfactory test is confirmed, the sewage solids will receive additional treatment until a satisfactory test is obtained. If unable to treat to permit limits, the non-conforming waste will be sent to a commercial hazardous waste disposal facility. In the event that unauthorized dumping was discovered, the Alaska State troopers as well as the Alaska DEC solid waste department will be notified. The owner will coordinate with ADEC to develop an appropriate clean-up plan. Any unauthorized dumping will be recorded on the monofill inspection form (Appendix I).	
	b. Repairing any damage to the facility or structures	
	In accordance with 18 AAC 60.800 (e), if the visual monitoring program identifies a deficiency, the facility's owner or operator shall take prompt action to correct the deficiency and place a written record of the completed corrective action in the operating record of the facility. The owner or operator shall provide written notification to the department at the time the deficiency is identified and at the time the corrective action is completed. Deficiencies, the appropriate corrective action and the date completed will be recorded in the inspection records. Heavy equipment and operators are generally available on site to make prompt repairs.	
	c. Addressing any violations of regulations or permit conditions.	
	The owner shall take prompt corrective action for any violation of permit conditions and/or any regulations applicable to the facility. These violations are considered a deficiency to be handled as described in Section 8.7.b.	
8.	<b>Operator training</b> [18 AAC 60.235; 18 AAC 60.240]	
	d. Identify any training that will be required for an operator, including on-the-job training.	

	<p>Monofill operations are expected to only be performed by the facility owners who are experienced with safe handling practices of sewage solids and familiar with the permitting requirements. If an employee must be trained in the future, they would be required to read and understand this permit and its associated requirements, as well as receive training on safe handling practices for sewage solids. Testing has identified the sewage solids for disposal to meet the requirements for Class B biosolids. Employees will be provided with and asked to thoroughly review the CDC guidance for controlling potential risks to workers exposed to class B biosolids (see Appendix M).</p>
	<p>e. Describe how that training will be documented and filed in the operating record.</p>
	<p>In the event an employee is hired, any training will be recorded in the operating record of the facility. The employee will sign a statement acknowledging the training they have received.</p>
9.	<p><b>Operating record</b> [18 AAC 60.235; 18 AAC 60.470]</p>
	<p>a. The operating record must include all the elements listed in 18 AAC 60.235 and any other documentation specific to the facility and operation.</p>
	<p>The operating record will include the permit application and approved permit, the operations plan, inspection records, disposal logs, pollutant concentration testing records, training procedures, training records, notification procedures, financial assurance documentation, as-built drawings of the facility, and any other documents required by this permit.</p>
	<p>b. The plan must state where the operating record will be located.</p>
	<p>The operating record will be located on site at the wastewater treatment receiving facility filter press building or at the nearby SWW office. The record will be stored in a location that is known and readily accessible for department review and review by employees working at the facility.</p>

## Section 9. Monitoring Plan

The monitoring plan must include sufficient detail to allow all monitoring to be completed in full compliance with the applicable regulations and permit conditions.

1.	<b>Visual monitoring plan</b> [18 AAC 60.210; 18 AAC 60.800(a)]	<u>PDF page</u>
	a. Description of the procedures for visual monitoring of the facility.	
	A trained operator as defined in Section 8.8.d. will visually inspect and record all findings in the inspection checklist located in Appendix I. Inspections will occur monthly and at the conclusion of all disposal events. Records will be kept in the operating record (see Section 8.9) for a minimum of five years.	
	b. Checklist or visual monitoring form including all applicable items in 18 AAC 60.800(a).	
	See Appendix I for the inspection checklist for visual monitoring of the facility.	
2.	<b>Surface water monitoring plan</b> (if required by DEC) [18 AAC 60.210; 18 AAC 60.810]	
	In accordance with 18 AAC 60.810, surface water monitoring is not required. There are no nearby surface waters as described in section 6 of this permit. Owner observations indicate there has been no standing or flowing water on the property at any time of the year. Dewatered septage will be placed in an excavation below surrounding grade per the monofill typical design as shown in Appendix C. There is no potential for run-off.	
	a. Information about topography and surface water flow at the facility.	N/A
	b. A detailed map showing permanent sampling site locations and surface water flow direction.	N/A
	c. Identification of and information about background and compliance sampling sites, including an explanation of why each site was chosen.	N/A
	d. Specific information about sampling frequency and schedules.	N/A
	e. A list of constituents for which samples will be analyzed.	N/A
	f. Detailed monitoring procedures as outlined in 18 AAC 60.810(e).	N/A
	g. A Quality Assurance and Quality Control Plan providing specific details about sampling and testing methodology.	N/A
	h. A statement that monitoring reports will be submitted to ADEC within 90 days of the sampling event or by the date(s) stipulated in the permit.	N/A
3.	<b>Groundwater monitoring plan</b> (if required by ADEC) [18 AAC 60.210; 18 AAC 60.217; 18 AAC 60.820-860]	<u>PDF page</u>
	Per 18 AAC 60.820 (b)(8) and Section 6.3.b. of this permit, a groundwater monitoring plan is not required as the annual precipitation at the site is less than 25 inches per year. In addition, the bottom of the unlined cell is more than 10 feet above groundwater as described in Section 6.3.a. of this permit and shown on the monofill typical design drawing in Appendix C.  Although not required, groundwater flow information is included for reference in Appendix E. The flow study was developed with information acquired from residential wells in the surrounding area. Groundwater flows northwest.	
	a. Information about groundwater hydrology at the facility including depth to groundwater, direction and velocity of flow, with supporting documentation.	N/A
	b. A detailed map showing well locations and groundwater flow direction and rate.	N/A
	c. Well drilling logs, soil boring logs and well installation information for all background and compliance wells.	N/A

	d. An explanation of how each groundwater monitoring well location was selected, including documentation such as geophysical reports, survey data or maps and any other data used to evaluate subsurface conditions at the facility and to determine monitoring well placement.	N/A
	e. Specific information about sampling frequency and schedules.	N/A
	f. A list of constituents for which samples must be analyzed.	N/A
	g. Information about statistical methods that will be used in statistical analysis of the analytical data.	N/A
	h. A Quality Assurance and Quality Control Plan providing specific details about sampling and testing methodology.	N/A
	i. A statement that monitoring reports will be submitted to ADEC within 90 days of the sampling event or by the date(s) stipulated in the permit, and the reports will comply with the Groundwater Monitoring Checklist on the ADEC website.	N/A
4.	<b>Explosive gas monitoring plan</b> (if applicable) [18 AAC 60.210; 18 AAC 60.470] The owner or operator of a sewage solids monofill containing more than 2,500 cubic yards of solid waste must establish a continuous explosive gas monitoring station in any building closer than 500 feet from the solid waste disposal area.	
	As described in Section 7.5.b., the monofill capacity is less than 2,500 cubic yards. An explosive gas monitoring plan is not required.	
	a. Identification and information about the construction and placement of gas monitoring wells and other monitoring sites.	N/A
	b. A detailed map showing gas wells, other monitoring locations, and all structures on and within one-quarter mile of the facility.	N/A
	c. Specific information about sampling frequency and schedules.	N/A
	d. Information about equipment and procedures used for methane concentration measurements.	N/A
	e. Information about how methane levels will be reported to ADEC.	N/A
	f. A statement that DEC will be notified immediately if levels exceed limits listed in 18 AAC 60.350.	N/A
5.	<b>Sewage solids monitoring plan</b> [18 AAC 60.020; 18 AAC 60.470] <span style="float: right;"><u>PDF page</u></span>	
	a. If the facility has no liner and leachate collection system, information regarding: <ul style="list-style-type: none"> <li>• The minimum distance from the sewage solids disposal area to the property line of the facility and the applicable maximum allowable concentration limits of arsenic, chromium, and nickel based on the tables in 18 AAC 60.470(c); and</li> <li>• The frequency and procedures for documenting that the concentrations of arsenic, chromium, and nickel in the sewage solids do not exceed the maximum allowable concentrations.</li> </ul>	
	<p>The minimum boundary to property line distance in Table B is specified 164 feet as shown on the site plan in Appendix B. In accordance with 18 AAC 60.470(c) Table B, this corresponds to pollutant concentration limits of 39 mg/kg of Arsenic, 260 mg/kg of Chromium, and 270 mg/kg of Nickel.</p> <p>The sampling shall be conducted once annually in accordance with 18AAC 60.470(j) Table C. The annual results will be recorded in the operating records and submitted to ADEC. Annual sampling should occur several months in advance of planned disposal dates to ensure time for re-sampling if required. A sample request kit and chain of custody document will be obtained from the approved testing company. Samples will be taken from the sewage solids storage building stockpile that is intended to be disposed of. Collect 1 cup of sample from 7 separate locations</p>	

	<p>around the stockpile and combine to form one representative sample in a new clean plastic bucket. Mix the container by hand agitation for 2 minutes ensuring all clumps are broken into small pieces and well mixed. Do not use metal tools other than clean stainless steel. Remove sample from the bucket and place in containers supplied with the kit. Label each container with the sticker included in the kit. Include Date, Time, Company, notate preservatives (if any), appropriate sample test method, and sample location. There are no preservatives required for Total Metals, PCB's, or TCLP. Store sealed samples in the dedicated sample fridge at 38° F for no more than 24 hours prior to sending. Samples must have enough ice packs to arrive less than 6° C. Complete/sign/date the chain of custody document and ship on ice packs with temperature blank via next day air or courier service. Ensure compliance with CDC guidelines provided in Appendix M.</p>	
	<p>b. A description of the sampling frequency and procedures for conducting TCLP analysis and PCB analysis of the sewage solids.</p>	
	<p>See Section 8.5.a for sampling frequency and procedures. Testing frequency will occur annually in concurrence with the total metals testing. Testing may be done from the same sample containers used for metals testing, or as directed by lab. TCLP limits will be less than As 5mg/l and Cr 5mg/l. PCB will also be tested.</p>	
	<p>c. A description of how the moisture content of the sewage solids will be monitored to ensure the requirement of 18 AAC 60.470(b) is met.</p>	
	<p>18 AAC 60.470(b) requires greater than 10% solids by weight for a sewage solids placed in a sewage solids monofill. Previous testing of dewatered septage for disposal at this site showed on average of 28% solids by weight. Operators will ensure waste is appropriately dewatered and able to pass the "paint filter test" prior to disposal (see Appendix L).</p>	
	<p>d. If sampling is required to demonstrate compliance with a particular pathogen reduction or vector attraction reduction method, provide a step by step procedure for the sampling.</p>	
	<p>Sampling is not required as described in Section 5.3.</p>	
6.	<p><b>Other Required Monitoring</b> [18 AAC 60.215]</p>	
	<p>For any other monitoring required by ADEC at the facility, include a plan that provides specific information on the process, procedures, equipment, and quality assurance procedures required for the monitoring process.</p>	<p>N/A</p>

**Section 10. Closure Plan and Cost Estimate**

It is understood that the closure plan submitted with the permit application will be conceptual and may change throughout the active life of the facility. If the facility is within 1 year of closure, a detailed closure plan must be submitted and approved by ADEC. The closure plan must include the following information:

1.	<b>Description of the closure process</b> [18 AAC 60.210; 18 AAC 60.245; 18 AAC 60.450-485; 18 AAC 60.470; 18 AAC 60.490]	<u>PDF page</u>
a.	A description of the final cover and appearance of the facility meeting the standards of 18 AAC 60.470(n)-.	
	The final cover will consist of 24 inches of native granular material and will be capped with sufficient native organic materials to support vegetation. Finished grade will be mounded and appropriately graded to promote drainage away from the cell without erosion or ponding. It will be revegetated with an Alaska Seed mix.	
b.	A description of the methods and procedures for final cover installation.	
	Final cover will be installed using a wide track dozer pulling native material from the adjacent reserved stockpile around the perimeter of the monofill. Wheeled vehicles and vibratory compactors will not be used to prevent pumping of the subgrade.	
c.	A timeline or schedule for all activities needed to complete closure.	
	A written closure and post-closure plan will be submitted to the department at least 180 days before the monofill will be closed. Grading the top cover and seeding is estimated to take 1 day. Final closure in accordance with the approved plan will occur within 90 days following approval unless delayed by weather such as freezing or wet/muddy material conditions. ADEC will be notified if delays occur and will be notified when closure is complete.	
d.	A description of the anticipated post closure (future) use of the property.	
	Future use will be restricted per the approved closure plan. The wastewater treatment plant will continue to operate, utilize, and control access to the area. No public access will be permitted in the monofil area. Future activities may include storage of vehicles, equipment, trailers, and job site materials. Beneficial re-use options such as composting would be considered.	
e.	A description and map of proposed survey monuments or permanent markers.	
	At site closure, the monofil area will be surveyed by a licenced surveyor and the corner locations of each monofil area recorded on a site map. The property corners will be used as the bench mark or monument of reference.	
f.	A statement of how ADEC will be notified that the requirements of 18 AAC 60.470(n) have been met.	
	ADEC will be notified in writing 180 days before the monofill will be closed as well as when the post closure requirements have been met.	

	g. A description of how the post-closure care requirements of 18 AAC 60.490 will be met.																																																																									
	<p>Per 18AAC 60.490 the owner shall record a notation on the deed of the property and will notify DEC once the recording has occurred. A copy of the notation on the deed shall also be recorded in the facility operating record. The recording shall contain the following information.</p> <ul style="list-style-type: none"> <li>• That the land has been used as a monofill</li> <li>• The type of waste that was placed in the monofill.</li> <li>• The geographical boundaries of the waste management areas;</li> <li>• Details of any final cover, cap, or other structures or devices installed as part of closure.</li> </ul> <p>A copy of the operating plan, analytical results, updated permit information, and a copy of the site closure approval will be kept on at the Sterling Water Works wastewater treatment site building or office for 5 years post closure.</p> <p>Visual monitoring for settlement and erosion will continue for a minimum of 60 consecutive months immediately following closure.</p>																																																																									
2.	<b>Financial information</b> [18 AAC 60.210; 18 AAC 60.265]																																																																									
	<p><b>A Facility Closure/Post-Closure Cost Estimate Worksheet</b> in Excel is available online at <a href="https://www.deq.virginia.gov/home/showpublisheddocument/2525">https://www.deq.virginia.gov/home/showpublisheddocument/2525</a> to assist you in calculating costs. Please note that you need to complete both tabs (CEW-01 and CEW-02), but only sections relevant to closure of your facility. <i>Courtesy of the State of Virginia</i></p>																																																																									
	a. The total present-day equivalent cost estimate for an independent contractor (do not assume the availability of any onsite material or machinery) to close the facility. A quote from a consultant or calculation showing all relevant operations for closure is required.	See Table Below																																																																								
	b. The total present-day equivalent cost estimate for an independent contractor to perform post-closure care of the facility.	See Table Below																																																																								
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	c. Demonstration of the mechanism of financial responsibility to cover the cost of closing the facility and post-closure care. Proof of financial responsibility may be demonstrated by self-insurance, insurance, or other guarantee approved by ADEC.																																																																									
	Global FCU will issue an “Irrevocable standby letter of credit” which will be submitted separately.																																																																									

**Section 11. Waiver Requests and Justification**

18 AAC 60.900 allows ADEC to grant an exemption from any regulation not required by federal law. The applicant will be billed separately for time spent reviewing waiver requests at the rate in 18 AAC 60.700(e).

1.	<b>Waiver requests must</b> include the specific regulation for which you are requesting a waiver, and for each requested waiver, a detailed justification that meets the criteria of 18 AAC 60.900 by demonstrating that: [18 AAC 60.210]
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	N/A - No waivers are requested.
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a.	The proposed alternative action will provide equal or better environmental protection, reduction in public health risk, and control of nuisance factors than compliance with the identified provision; or
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b.	Compliance with the identified provision would cost significantly more than the value of the environmental benefit, public health risk reduction, and nuisance avoidance that could be achieved through that compliance.
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**Additional information**

Attach any additional information necessary to accurately reflect the location, construction, and operations of the facility.

See Table of Contents on Page 1 of this application for list of Appendices.

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L  
A  
S  
K  
A

**2015-007097-0**

Recording Dist: 302 - Kenai

8/13/2015 08:40 AM Pages: 1 of 2



File for Record at Request of:

**First American Title Insurance Company**

AFTER RECORDING MAIL TO:

Name: Andrew K. Holland

Address: ~~37685 and 37605 Robinson Loop Road~~ 37446 DUTCH LANDING LOOP  
Sterling, AK 99672

File No.: **0223-2495918 (DM)**

---

### STATUTORY WARRANTY DEED

THE GRANTOR, **Jerry K. Holland and Patsy M. Holland, husband and wife**, whose mailing address is **36680 Dutch Landing Loop, Sterling, AK 99672**, for and in consideration of **TEN DOLLARS AND OTHER GOOD AND VALUABLE CONSIDERATION**, in hand paid, conveys and warrants to **Andrew K. Holland, an unmarried person**, residing at 37446 DUTCH LANDING LOOP, STERLING AK 99672, the following described real estate, situated in the **Kenai** Recording District, <sup>A</sup>Judicial District, State of **Alaska**:

THIRD

**Parcel No. 1:**

**Tract A-1, DUTCH LANDING SUBDIVISION PART TWO**, according to the official plat thereof, filed under Plat Number **98-66**, Records of the Kenai Recording District, Third Judicial District, State of Alaska.

**Parcel No. 2:**

**That portion of the Northeast one-quarter of the Northwest one-quarter (NE1/4 NW1/4) of Section 9, Township 5 North, Range 9 West, Seward Meridian, Kenai Recording District, Third Judicial District, State of Alaska.**

**EXCEPTING THEREFROM Dutch Landing Subdivision Part Two, Plat Number 98-66.**

SUBJECT TO reservations, exceptions, easements, covenants, conditions and restrictions of record, if any.

Dated: August 12, 2015.

Jerry K. Holland  
Jerry K. Holland

Patsy M. Holland  
Patsy M. Holland

STATE OF Alaska )  
 ) SS.  
Third Judicial District )

THIS IS TO CERTIFY that on this 12 day of August, 2015, before me the undersigned Notary Public, personally appeared **Jerry K. Holland and Patsy M. Holland**, known to me and to me known to be the individual(s) described in and who executed the foregoing instrument and he/she/they acknowledged to me that he/she/they signed the same freely and voluntarily for the uses and purposes therein mentioned.

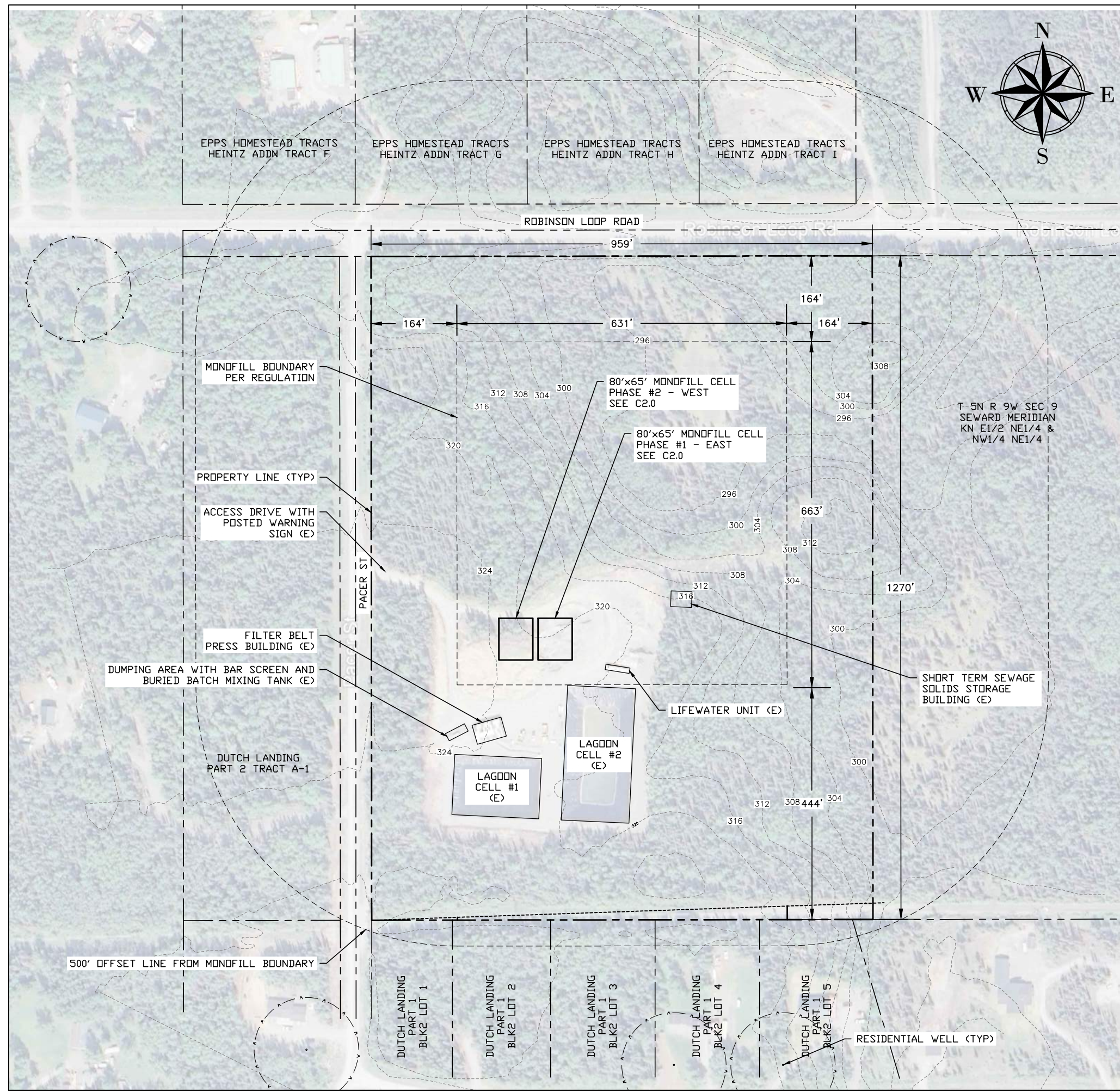
WITNESS my hand and official seal.

Dawni Mary

Notary Public in and for Alaska  
My commission expires 5-5-18







**NOTES:**

1. SITE PLAN DEVELOPED FROM SHEET C1 LOCATION PLAN, BY PANNONE ENGINEERING SERVICES, LLC, STAMPED 01/06/23, AND MODIFIED TO REFLECT AS-BUILT CONDITIONS USING 06/13/24 AERIAL IMAGERY.

**AE**  
**Aardvark Engineering**  
 PO Box 2135  
 Palmer, AK 99645  
 907.252.8377

**Sterling Water Works, LLC**  
**Monofill Design**  
 37605 Robinson Loop Rd  
 Sterling, AK 99672

**TABLE B**  
**MAXIMUM ALLOWABLE POLLUTANT CONCENTRATIONS IN SEWAGE SOLIDS PLACED IN A MONOFILL WITHOUT A LINER AND LEACHATE COLLECTION SYSTEM WITH A BOUNDARY LESS THAN 500 FEET FROM THE FACILITY PROPERTY LINE**

Unit boundary to property line distance (feet)	POLLUTANT CONCENTRATION*		
	Arsenic (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)
0 to less than 82	30	200	210
82 to less than 164	34	220	240
164 to less than 246	39	260	270
246 to less than 328	46	300	320
328 to less than 410	53	360	390
410 to less than 492	62	450	420

\* Dry weight basis

SOURCE: 18 AAC 60.470

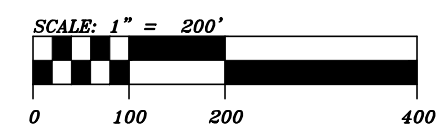
REVISION:	03/18/26
A	ISSUED FOR PERMITTING



SHEET TITLE:  
**SEWAGE SOLIDS MONOFILL SITE PLAN**

SHEET #:

**C1.0**



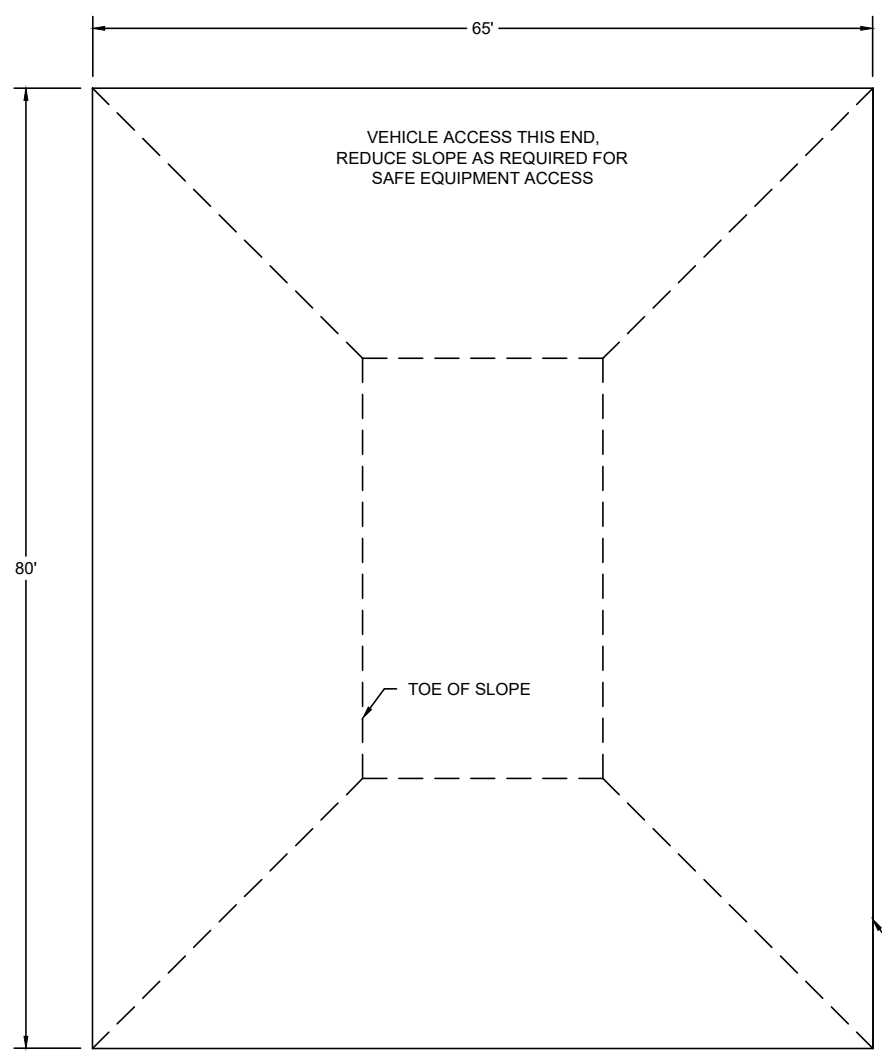


Aardvark  
Engineering  
PO Box 2135  
Palmer, AK 99645  
907.252.8377

Sterling Water Works, LLC  
Monofill Design

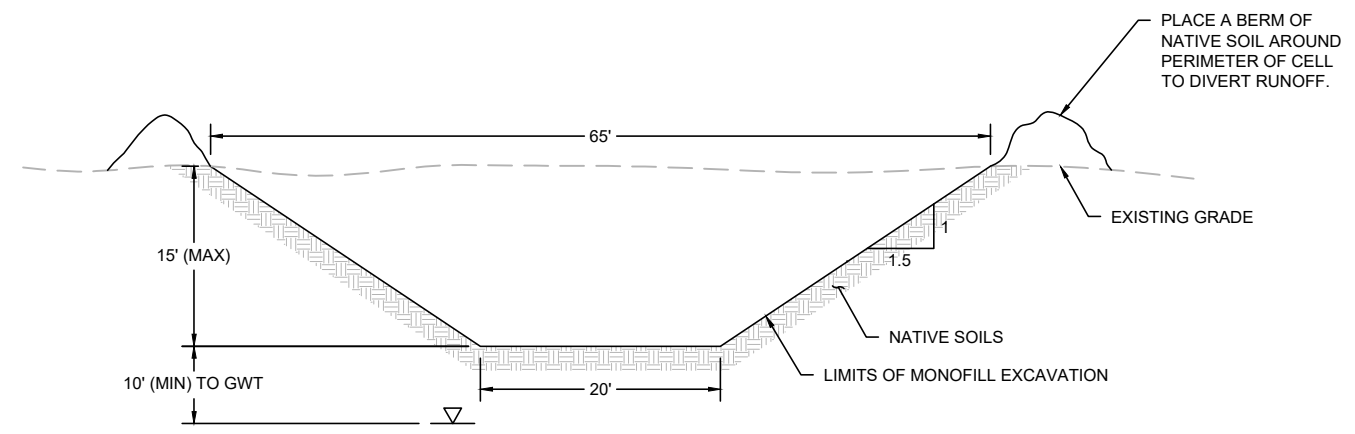
37605 Robinson Loop Rd  
Sterling, AK 99672

REVISION:	03/18/26
A	ISSUED FOR PERMITTING



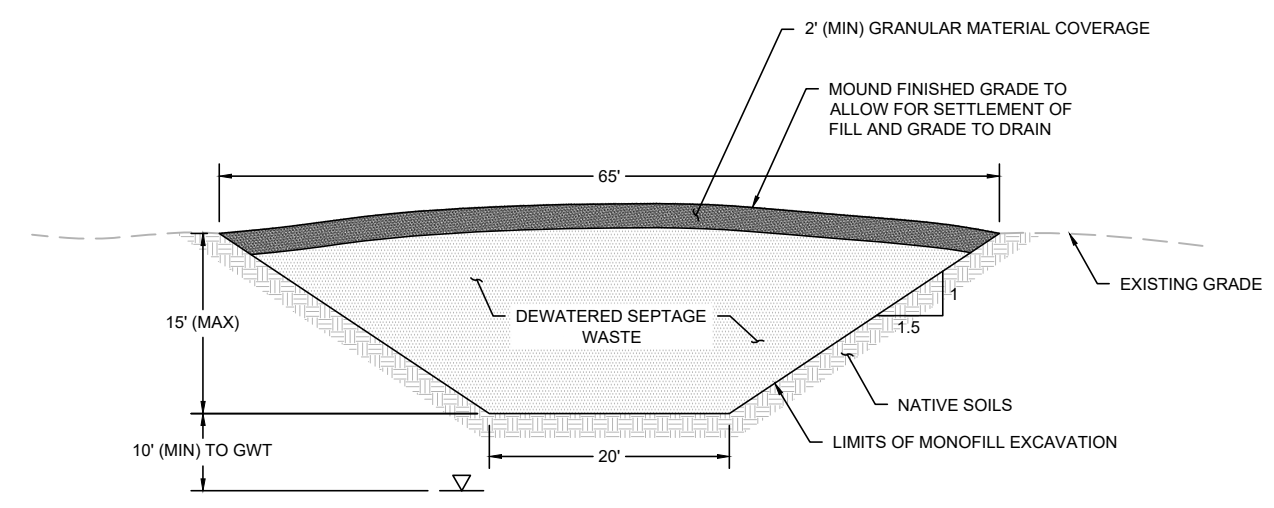
1/C2.0 CONSTRUCTED CELL PLAN VIEW

SCALE: 1/16" = 1'



A/C2.0 CONSTRUCTED CELL CROSS SECTION

SCALE: 1/16" = 1'

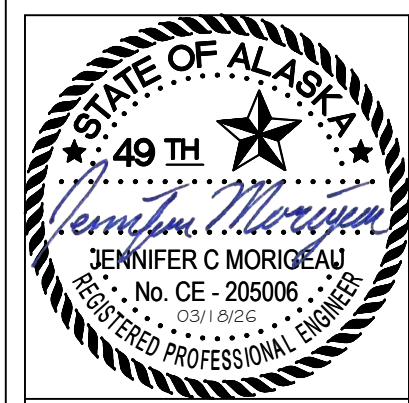


B/C2.0 FINISHED CELL CROSS SECTION

SCALE: 1/16" = 1'

NOTES:

1. THE CONSTRUCTED CELL IN OPERATION SHALL BE COVERED WITH 12 INCHES OF SOIL OR OTHER MATERIAL AT THE END OF EACH OPERATING DAY AS A VECTOR REDUCTION METHOD.
2. THE FINISHED CELL SHALL HAVE 2 FEET MINIMUM OF GRANULAR MATERIAL FOR FINAL COVER.
3. THE FINISHED CELL SHALL BE CAPPED WITH SUFFICIENT NATIVE ORGANIC MATERIALS TO SUPPORT VEGETATION.
4. THE FINISHED CELL SHALL BE RE-VEGETATED WITH ALASKA SEED MIX.
5. SAFE SIDE SLOPES SHALL BE MAINTAINED AT 1.5:1 OR FLATTER.
6. USEABLE WASTE VOLUME IS APPROXIMATELY 1,098 CUBIC YARDS PER CELL.
7. THE PHASE 2 CELL SHALL HAVE A MINIMUM 10 FEET SEPARATION FROM THE PHASE 1 CELL AS MEASURED FROM THE TOP OF SLOPE.

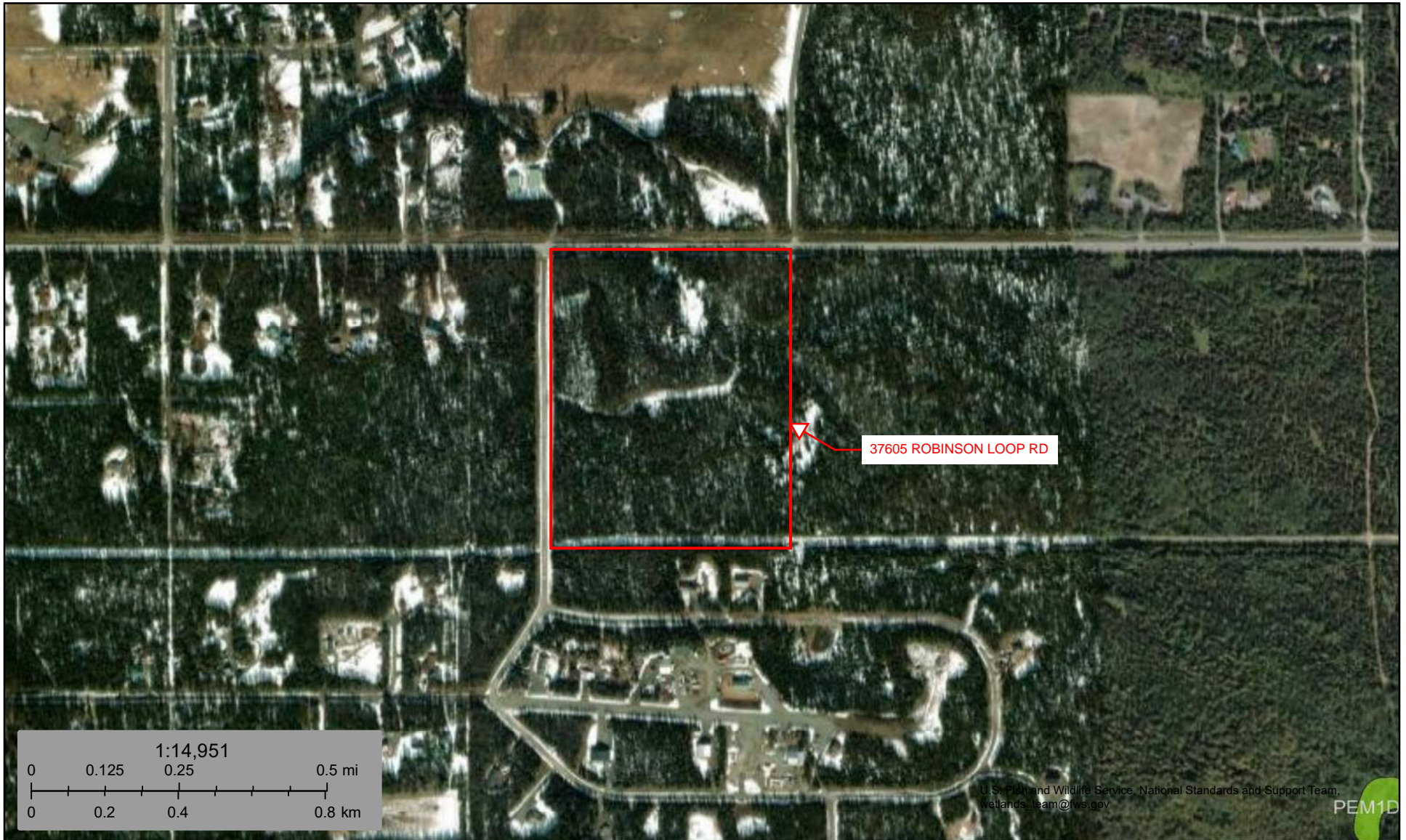


SHEET TITLE:

SEWAGE SOLIDS  
MONOFILL CELL  
TYPICAL DETAILS

SHEET #:

C2.0



March 9, 2026

**Wetlands**

- |   |                                |   |                                   |   |          |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland       |  | Lake     |
|  | Estuarine and Marine Wetland   |  | Freshwater Forested/Shrub Wetland |  | Other    |
|   |                                |  | Freshwater Pond                   |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



**DEPARTMENT OF THE ARMY**  
**ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS**  
**REGULATORY DIVISION**  
**P.O. BOX 6898**  
**JBER, AK 99506-0898**

January 14, 2026

Regulatory Division  
POA-2025-00517

Andrew Holland  
Sterling Water Works  
38674 Pacer Street  
Sterling, AK 99672

Dear Mr. Holland:

This letter responds to your December 20, 2025, request for a Department of the Army (DA) approved jurisdictional determination (AJD) for your property. It has been assigned number POA-2025-00517, Kenai River, which should be referred to in all correspondence with us. The project site is located within Section 9, T. 5 N., R. 9 W., Seward Meridian; Latitude 60.543691° N., Longitude 150.870342° W.; Kenai Peninsula Borough; in Sterling, Alaska.

Based on our review of the information you provided, we have determined the subject property does not contain waters of the United States (U.S.) under Corps of Engineers (USACE) jurisdiction. Therefore, a DA permit is not required. A copy of the AJD form is available at [www.poa.usace.army.mil/Missions/Regulatory/Jurisdictional-Determinations/Issued-Approved-Jurisdictional-Determinations/](http://www.poa.usace.army.mil/Missions/Regulatory/Jurisdictional-Determinations/Issued-Approved-Jurisdictional-Determinations/) under the above file number. Please contact us if you decide to alter the method, scope, or location of your proposed activity.

This AJD is valid for a period of five (5) years from the date of the AJD form, unless new information supporting a revision is provided to us before the expiration date.

Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form regarding this approved jurisdictional determination (see section labeled "Approved Jurisdictional Determination").

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). USACE defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at [Rebecca.S.Manbeck2@usace.army.mil](mailto:Rebecca.S.Manbeck2@usace.army.mil), by mail at the address above, or by phone at (907) 251-6716, if you have questions. For more information about the Regulatory Program, please visit our website at [www.poa.usace.army.mil/Missions/Regulatory](http://www.poa.usace.army.mil/Missions/Regulatory).

Sincerely,

A handwritten signature in cursive script that reads "Rebecca Manbeck".

Rebecca Manbeck  
Regulatory Specialist

Enclosures



DEPARTMENT OF THE ARMY  
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS  
REGULATORY DIVISION  
P.O. BOX 6898  
JBER, AK 99506-0898

CEPOA-RDS-N-C

14 January 2026

MEMORANDUM FOR RECORD

SUBJECT: US Army Corps of Engineers (Corps) Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023),<sup>1</sup> POA-2025-00517

BACKGROUND. An Approved Jurisdictional Determination (AJD) is a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. AJDs are clearly designated appealable actions and will include a basis of JD with the document.<sup>2</sup> AJDs are case-specific and are typically made in response to a request. AJDs are valid for a period of five years unless new information warrants revision of the determination before the expiration date or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.<sup>3</sup> For the purposes of this AJD, we have relied on section 10 of the Rivers and Harbors Act of 1899 (RHA),<sup>4</sup> the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 *Rapanos-Carabell* guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the *Sackett* decision (reference 2.d.) in evaluating jurisdiction.

This Memorandum for Record (MFR) constitutes the basis of jurisdiction for a Corps AJD as defined in 33 CFR §331.2. The features addressed in this AJD were evaluated consistent with the definition of “waters of the United States” found in the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. This AJD did not rely on the 2023 “Revised Definition of ‘Waters of the United States,’” as amended on 8 September 2023 (Amended 2023 Rule) because, as of the date of this decision, the Amended 2023 Rule is not applicable in this state due to litigation.

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<sup>1</sup> While the Supreme Court's decision in *Sackett* had no effect on some categories of waters covered under the CWA, and no effect on any waters covered under RHA, all categories are included in this Memorandum for Record for efficiency.

<sup>2</sup> 33 CFR 331.2.

<sup>3</sup> Regulatory Guidance Letter 05-02.

<sup>4</sup> USACE has authority under both Section 9 and Section 10 of the Rivers and Harbors Act of 1899 but for convenience, in this MFR, jurisdiction under RHA will be referred to as Section 10.

## 1. SUMMARY OF CONCLUSIONS.

- a. The review area is comprised entirely of dry land (i.e., there are no waters such as streams, rivers, wetlands, lakes, ponds, tidal waters, ditches, and the like in the entire review area and there are no areas that have previously been determined to be jurisdictional under the Rivers and Harbors Act of 1899 in the review area).

Based on satellite imagery, the review area appears to be made-up entirely of dryland. Dominant vegetation communities consist of mixed canopies of birch and tall spruce, and understories of facultative herbs and shrubs. According to the USDA Soil Survey, soils are primarily composed of well-drained silty and sandy loams that lack hydric soil indicators.

The National Wetland Inventory (NWI) and Kenai Peninsula Borough (KPB) do not classify the site as wetland and the National Hydrography Dataset (NHD) includes no surface water features. Likewise, satellite imagery over several different years shows no signs of surface water or hydrology patterns.

## 2. REFERENCES.

- a. Final Rule for Regulatory Programs of the Corps of Engineers, 51 FR 41206 (November 13, 1986).
- b. Clean Water Act Regulatory Programs, 58 FR 45008 (August 25, 1993).
- c. U.S. EPA & U.S. Army Corps of Engineers, Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (December 2, 2008)
- d. *Sackett v. EPA*, 598 U.S. 651, 143 S. Ct. 1322 (2023)
- e. "Memorandum To The Field Between The U.S. Department Of The Army, U.S. Army Corps Of Engineers And The U.S. Environmental Protection Agency Concerning The Proper Implementation Of 'Continuous Surface Connection' Under The Definition Of "Waters Of The United States" Under The Clean Water Act" (March 12, 2025)

## 3. REVIEW AREA.

The review area is comprised of 28 acres of land identified as a proposed sewage solids monofill to support an existing wastewater treatment facility located on the

CEPOA-RDS-N

SUBJECT: Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023), POA-2025-00517

parcel. The review area is located within Section 9, T. 5 N., R. 9 W., Seward Meridian; Latitude 60.543691° N., Longitude 150.870342° W.; Kenai Peninsula Borough; in Sterling, Alaska. The 28 acres includes mostly undeveloped lands with an approximately 4-acre cleared area containing the wastewater treatment facility.

4. NEAREST TRADITIONAL NAVIGABLE WATER (TNW), INTERSTATE WATER, OR THE TERRITORIAL SEAS TO WHICH THE AQUATIC RESOURCE IS CONNECTED.

The nearest TNW is the Kenai River.

5. FLOWPATH FROM THE SUBJECT AQUATIC RESOURCES TO A TNW, INTERSTATE WATER, OR THE TERRITORIAL SEAS

N/A

6. SECTION 10 JURISDICTIONAL WATERS<sup>5</sup>: Describe aquatic resources or other features within the review area determined to be jurisdictional in accordance with Section 10 of the Rivers and Harbors Act of 1899. Include the size of each aquatic resource or other feature within the review area and how it was determined to be jurisdictional in accordance with Section 10.<sup>6</sup>

N/A

7. SECTION 404 JURISDICTIONAL WATERS: Describe the aquatic resources within the review area that were found to meet the definition of waters of the United States in accordance with the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. List each aquatic resource separately, by name, consistent with the naming convention used in section 1, above. Include a rationale for each aquatic resource, supporting that the aquatic resource meets the relevant category of "waters of the United States" in the pre-2015 regulatory regime. The rationale should also include a written description of, or reference to a map in the administrative record that shows, the lateral limits of jurisdiction for each aquatic resource, including how that limit was determined, and incorporate relevant

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<sup>5</sup> 33 CFR 329.9(a) A waterbody which was navigable in its natural or improved state, or which was susceptible of reasonable improvement (as discussed in § 329.8(b) of this part) retains its character as "navigable in law" even though it is not presently used for commerce, or is presently incapable of such use because of changed conditions or the presence of obstructions.

<sup>6</sup> This MFR is not to be used to make a report of findings to support a determination that the water is a navigable water of the United States. The district must follow the procedures outlined in 33 CFR part 329.14 to make a determination that water is a navigable water of the United States subject to Section 10 of the RHA.

references used. Include the size of each aquatic resource in acres or linear feet and attach and reference related figures as needed.

- a. TNWs (a)(1): N/A
- b. Interstate Waters (a)(2): N/A
- c. Other Waters (a)(3): N/A
- d. Impoundments (a)(4): N/A
- e. Tributaries (a)(5): N/A
- f. The territorial seas (a)(6): N/A
- g. Adjacent wetlands (a)(7): N/A

#### 8. NON-JURISDICTIONAL AQUATIC RESOURCES AND FEATURES

- a. Describe aquatic resources and other features within the review area identified as “generally non-jurisdictional” in the preamble to the 1986 regulations (referred to as “preamble waters”).<sup>7</sup> Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA as a preamble water. N/A
- b. Describe aquatic resources and features within the review area identified as “generally not jurisdictional” in the *Rapanos* guidance. Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA based on the criteria listed in the guidance. N/A
- c. Describe aquatic resources and features identified within the review area as waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA. Include the size of the waste treatment system within the review area and describe how it was determined to be a waste treatment system.

Approximately 1 acre of the review area contains two Alaska Department of Environmental Conservation approved wastewater treatment ponds. Per 33 CFR

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<sup>7</sup> 51 FR 41217, November 13, 1986.

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SUBJECT: Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023), POA-2025-00517

328.3 (b)(1), treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act are not considered waters of the United States.

- d. Describe aquatic resources and features within the review area determined to be prior converted cropland in accordance with the 1993 regulations (reference 2.b.). Include the size of the aquatic resource or feature within the review area and describe how it was determined to be prior converted cropland. N/A
  - e. Describe aquatic resources (i.e. lakes and ponds) within the review area, which do not have a nexus to interstate or foreign commerce, and prior to the January 2001 Supreme Court decision in “*SWANCC*,” would have been jurisdictional based solely on the “Migratory Bird Rule.” Include the size of the aquatic resource or feature, and how it was determined to be an “isolated water” in accordance with *SWANCC*. N/A
  - f. Describe aquatic resources and features within the review area that were determined to be non-jurisdictional because they do not meet one or more categories of waters of the United States under the pre-2015 regulatory regime consistent with the Supreme Court’s decision in *Sackett* (e.g., tributaries that are non-relatively permanent waters; non-tidal wetlands that do not have a continuous surface connection to a jurisdictional water).  
N/A
9. DATA SOURCES. List sources of data/information used in making determination. Include titles and dates of sources used and ensure that information referenced is available in the administrative record.
- a. USDA Web Soil Survey, accessed January 13, 2026
  - b. USFWS National Wetlands Inventory (NWI) Wetlands Mapper, accessed January 13, 2026
  - c. USGS National Wetland Hydrography Dataset, accessed January 13, 2026
  - d. Kenai Peninsula Borough (KPB) Wetlands Mapper, accessed January 13, 2026
  - e. World Imagery Wayback, accessed January 13, 2026
  - f. Google Earth Aerial Imagery, accessed January 13, 2026
10. OTHER SUPPORTING INFORMATION. Based on a review of the best available information, the review area is comprised entirely of uplands. There are no



CEPOA-RDS-N

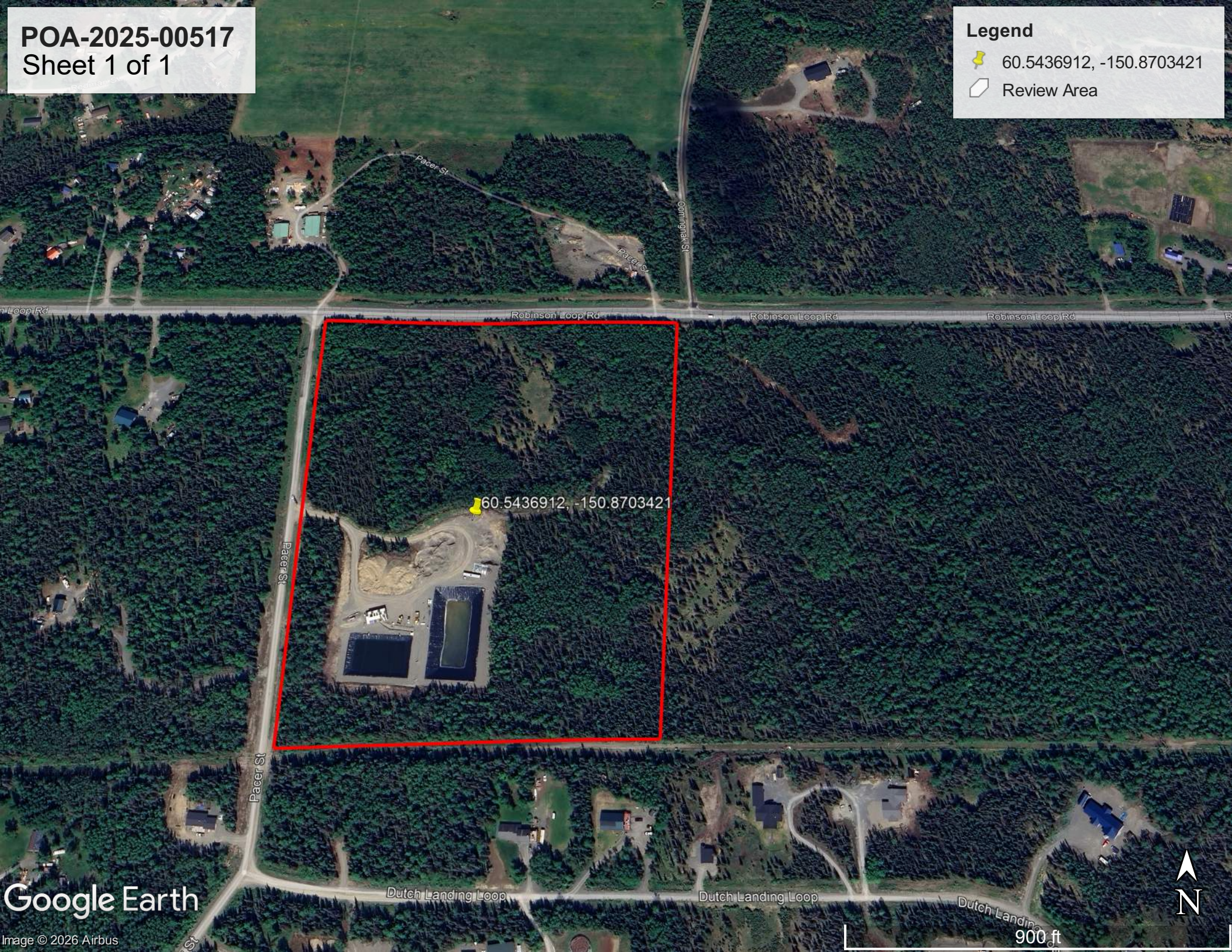
SUBJECT: Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023), POA-2025-00517

waterbodies in the review area regulated under Section 10 of the Rivers and Harbors Act and no aquatic resources that would be regulated under Section 404 of the Clean Water Act.

11. NOTE: The structure and format of this MFR were developed in coordination with the EPA and Department of the Army. The MFR's structure and format may be subject to future modification or may be rescinded as needed to implement additional guidance from the agencies; however, the approved jurisdictional determination described herein is a final agency action.

**Legend**

-  60.5436912, -150.8703421
-  Review Area



60.5436912, -150.8703421



900 ft

## NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Andrew Holland Sterling Water Works	File Number: POA-2025-00517	Date: January 14, 2026
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Attached is:	See Section Below
<input type="checkbox"/> INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/> PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/> PERMIT DENIAL	C
<input checked="" type="checkbox"/> APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/> PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at [http://www.usace.army.mil/CECW/Pages/reg\\_materials.aspx](http://www.usace.army.mil/CECW/Pages/reg_materials.aspx) or Corps regulations at 33 CFR Part 331.

**A: INITIAL PROFFERED PERMIT:** You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

**B: PROFFERED PERMIT:** You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**C: PERMIT DENIAL:** You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

**SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact:

Rebecca Manbeck  
Alaska District Corps of Engineers  
CEPOA-RD-S  
P.O. Box 6898  
JBER, AK 99506-0898  
907-251-6716  
Rebecca.S.Manbeck2@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

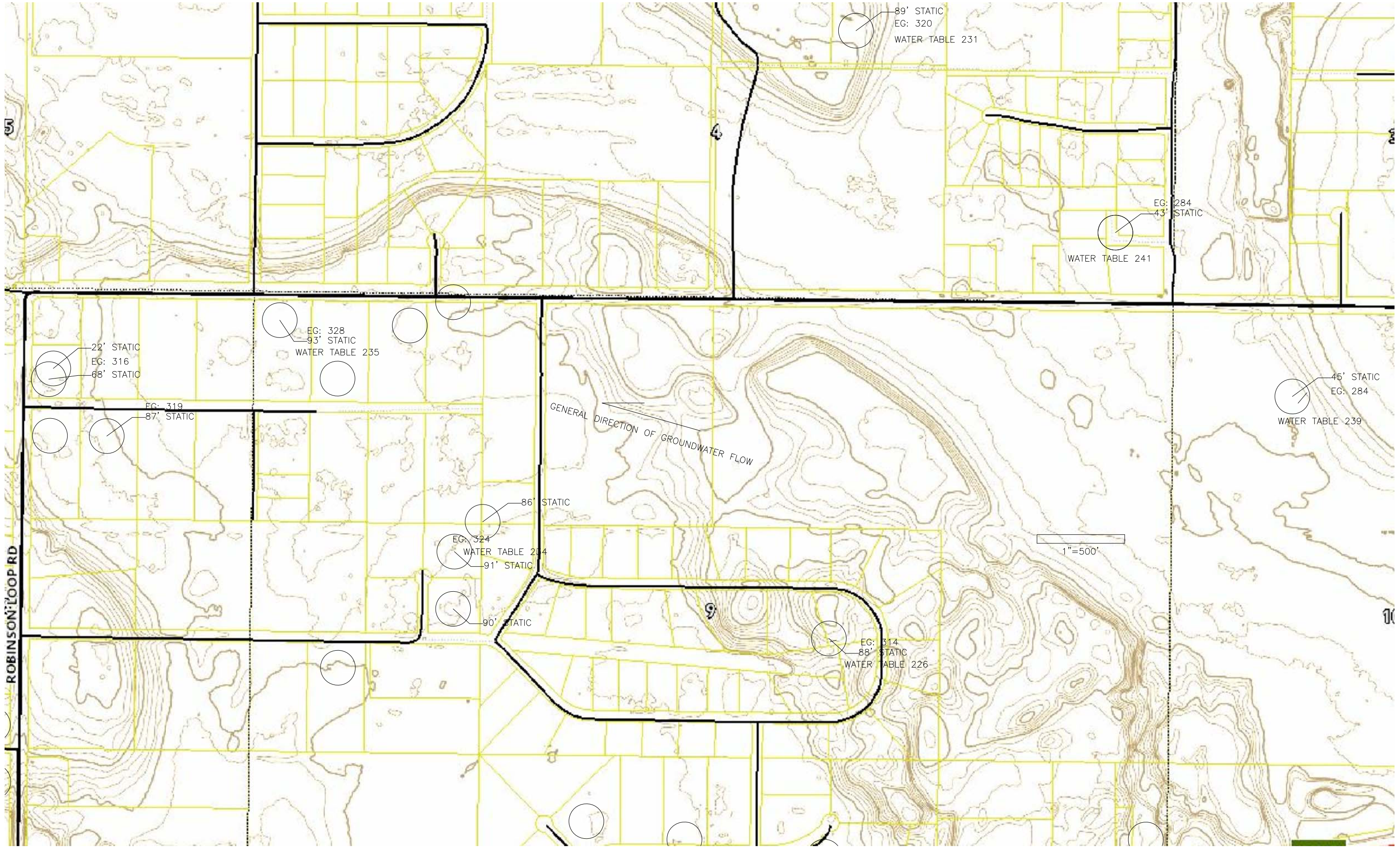
Ms. Kate Bliss  
Regulatory Program Manager  
U.S. Army Corps of Engineers, Pacific Ocean Division  
CEPOD-PDC, Bldg. 525  
Fort Shafter, HI 96858-5440  
(808) 835-4626  
Kate.M.Bliss@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

\_\_\_\_\_  
Signature of appellant or agent.

Date:

Telephone number:



Groundwater Flow Determination sourced from ADEC Permit #: PA-000054

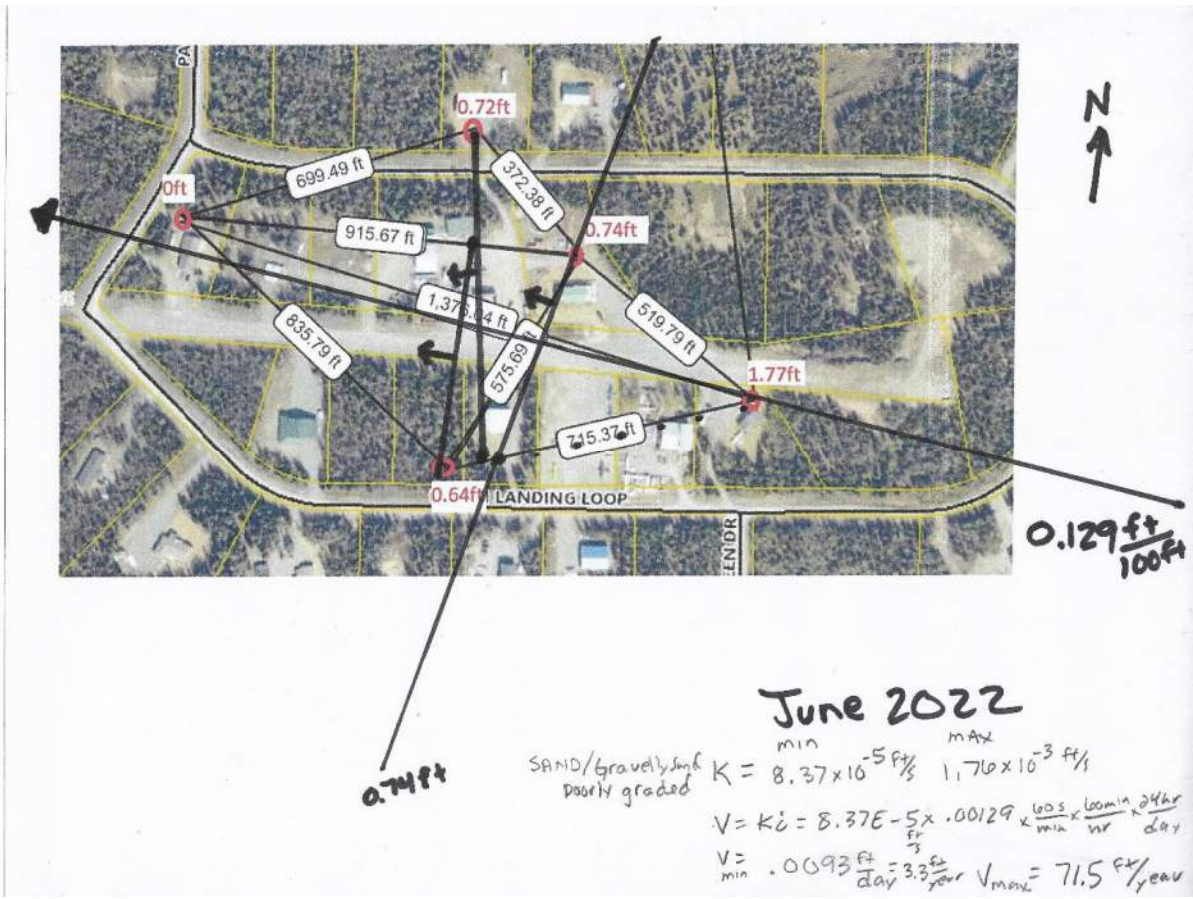


Figure 9: Groundwater Flow Direction and velocity

Groundwater Flow Direction and Velocity Study sourced from ADEC Permit #: PA-000054

Well Drilling Log ---- Kraxberger Drilling Inc. ----- (907) 262-4720

35055 Gas Well Road

Soldotna, AK 99669

CLIENTNAME: BRIAN HOLLAND

LOGID: 7691

LEGAL1: T5NRWSEC9 SEWARD MERID

PUMPINFO:

LEGAL2: KN THAT PORTION OF NE1/4

PARCEL#: 06335147

DIAMETER: 6

ROADAREA: ROBINSON LOOP, PACER ST  
37605 ROBINSON LOOP

RIGTYPE: AR

CASINGTYPE: STEEL

CITY: SOLDOTNA

GROUT:

BUILDERNAME:

WELLCOMPLETION:

DEPTH: 138

DATE: 10/23/2023

DRILLER: RRK

IRON PPM: 1.0-1.5 PPM

YIELDGPM: 150

SCREEN: 0.010 129-138

STATICLEVEL: 86

CLASS:

CASINGLENGTH: 132

LATITUDE:

CASINGSTICKUP: 3 FT

LONGITUDE:

**DRILLING REPORT:**

0-22 SAND AND GRAVEL

22-46 LAYERS SAND, SILT, GRAVEL

46-54 SAND

54-57 SILTY SAND

57-59 TAN CLAY

59-95 SAND

95-109 WET SAND

109-126 SAND, GRAVEL, WATER

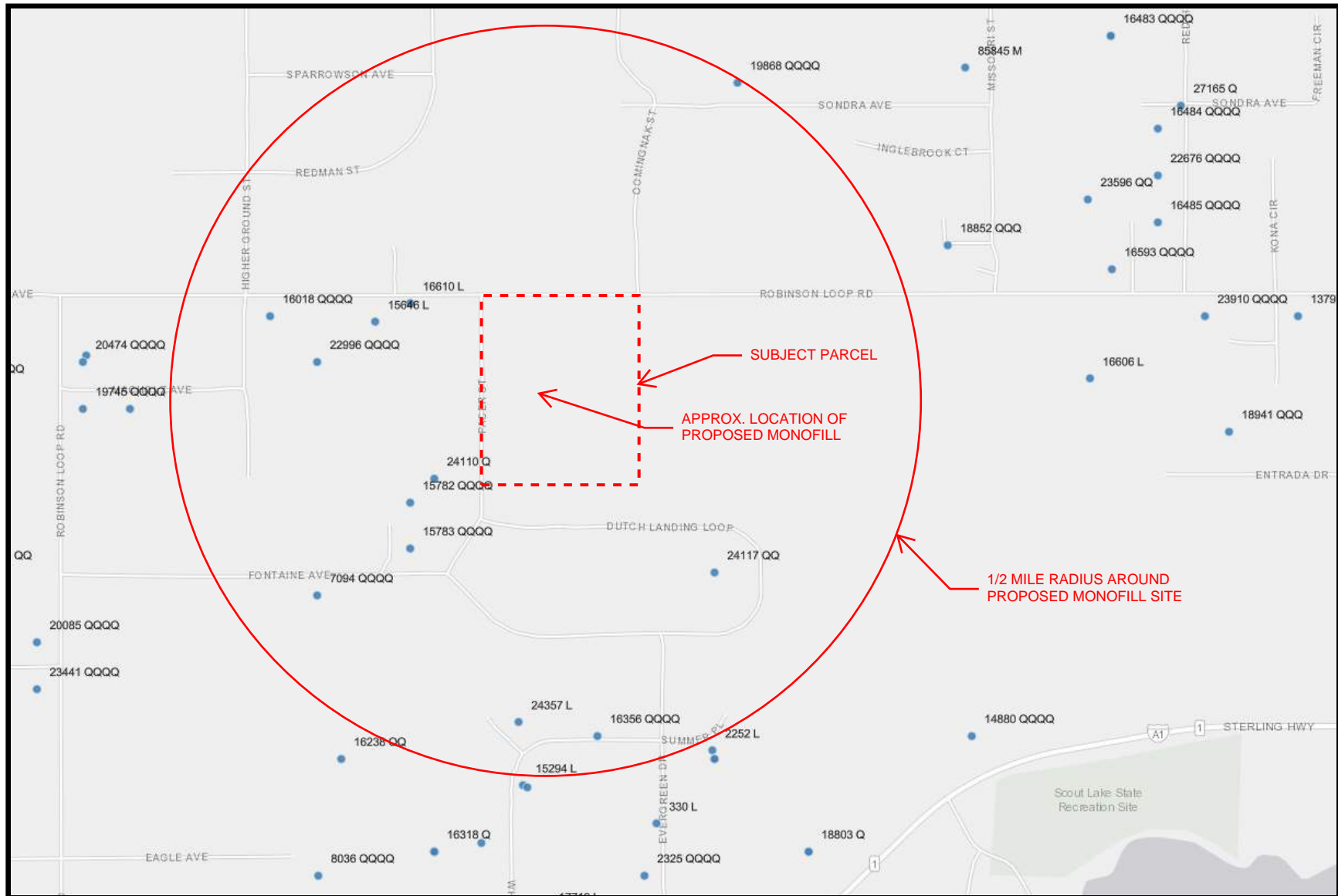
126-127 SILTY WET SAND

127-138 SAND AND WATER

# Alaska Department of Natural Resources ArcGIS Online

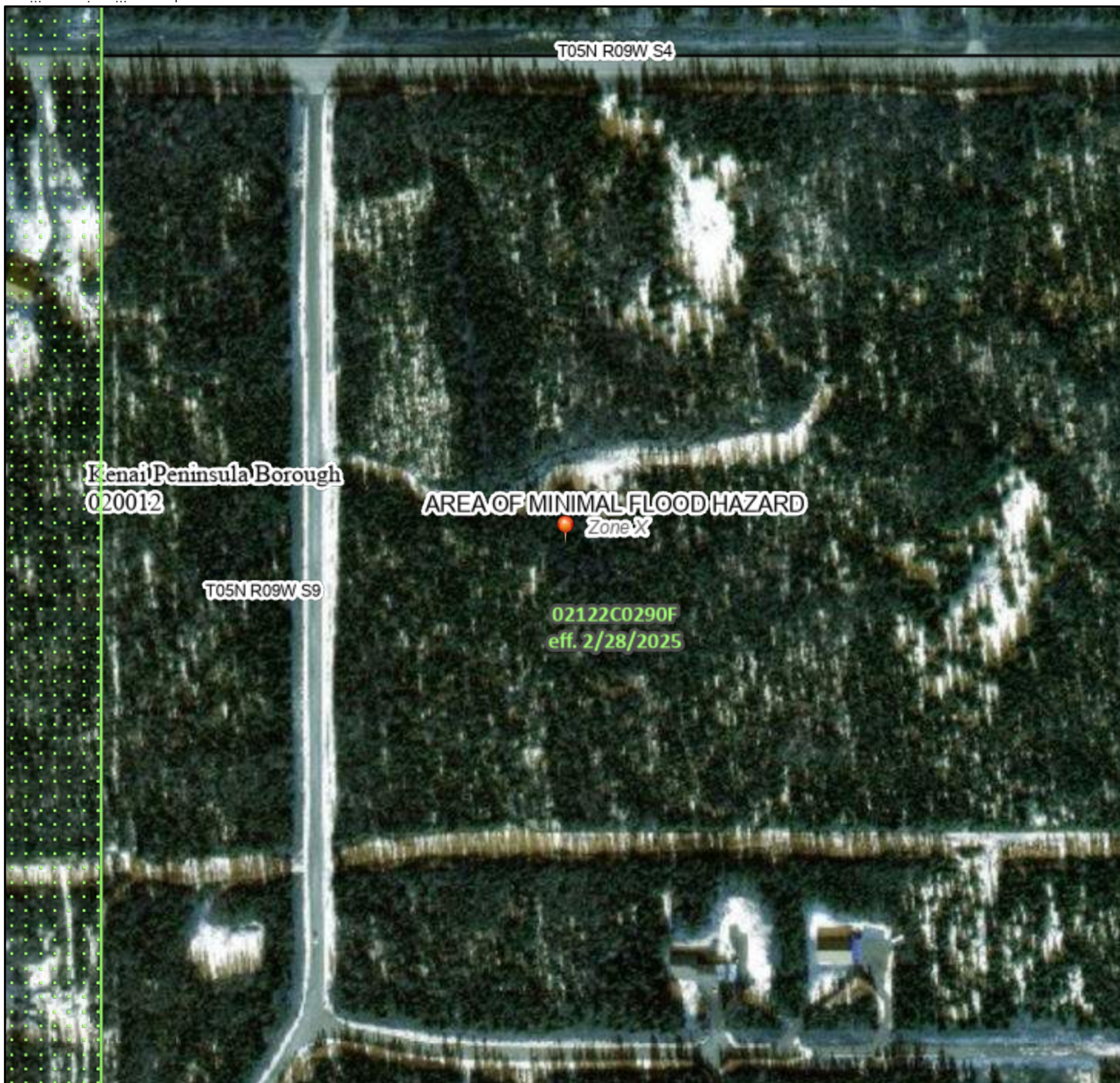
## DNR Well Log - WELTS

<https://data-soa-dnr.opendata.arcgis.com/datasets/SOA-DNR::dnr-well-log-welts/explore?location=60.541254%2C-150.863655%2C16>



MAP OF WELLS WITHIN 1/2 MILE OF PROPOSED MONOFILL AT 37605 ROBINSON LOOP RD

Note: This map is managed by DNR and may not include all wells.



6(( ,.6 5(3257 )25 '(7\$,/( ' /(\*('1' \$1' ,1'(: 0\$3 )25 ) ,50

63(&,\$ / )/2  
+=\$=\$5' \$5(

:LWKR XW %DVH )ORRG (O  
=RQH \$ 9 \$  
:LWK %)( R UR QHSWK 2 \$+ 9  
5HJXODWRU\ )ORRGZD\

12 6&5(( \$UHD RI 0LQLPDO )ORRG  
(IHFWLYH /205V  
27+(5 \$5 (\$6 2) \$UHD RI 8QGHWUPLQHG  
\*(1(\$ /- --- &KDQQHO &XOYHUW RU  
6758&785(16) /HYHH 'LNH RU )ORRGZD

&URVV 6HFWRQRV ZLWK  
:DWHU 6XUIDFH (OHYDWL  
&RDVWDO 7UDQVHFV  
%DVH )ORRG (OHYDWLRQ  
/LPL RI 6WXG\  
-XULVGLFWLRQ %RXQGDU  
&RDVWDO 7UDQVHFV %DV  
27+(5 3URILOH %DVHOLQH  
)(\$785(6 +\GURJUDSKLF )HDWXUH

'LJLWDO 'DWD \$YDLODEO  
1R 'LJLWDO 'DWD \$YDLOD  
0\$3 3\$1(/6 8QPSSHG  
7KH SLQ GLVSOD\HG RQ WKH  
SRLQW VHOHFWHG E\ WKH XV  
DQ DXWKRULWDWLYH SURSHU

7KLV PDS FRPSOLHV ZLWK )(0\$ V VWDQ  
GLJLWDO IORRG PDSV LI LW LV QRW YR  
7KH EDVHPDS VKRZQ FRPSOLHV ZLWK )(D  
DFFXUDF\ VWDQGDUGV  
7KH IORRG KDJDUG LQIRUPDWLRQ LV GH  
DXWKRULWDWLYH 1)+/ ZHE VHUFLFHV S  
ZDV H\SRUWHG RQW . DQG GRHV QRW  
UHIOHFV FKDQJHV RU DPHQGPHQW VX  
WLPH 7KH 1)+/ DQG HIIHFWLYH LQIRUP  
EHFRPH VXSHUVHGHG E\ QHZ GDWD RYH  
7KLV PDS LPDJH LV YRLG LI WKH RQH R  
HOHPHQWV GR QRW DSSHDU. EDVHPDS  
OHJHQG VFDOH EDU PDS F\HDWLRQ G  
,50 SDQHO QXPEHU DQG ),50 HIIHFWLY  
XQPSSHG DQG XQPRGHUQLJHG DUHDV  
UHJXODWRU\ SXUSRHVH

**MONOFILL INSPECTION FORM**

**SWW MGMT LLC. STERLING, ALASKA SEWAGE SOLIDS MONOFILL SITE**

INSPECTION DATE		DATE OF LAST DISPOSAL EVENT	INSPECTOR NAME / INITIALS	WEATHER (TEMPERATURE, PRECIPITATION, WIND)	
ITEMS TO INSPECT		REMARKS/COMMENTS	CORRECTIVE ACTION (IF REQUIRED)		
			DESCRIPTION	DATE COMPLETED	
1	Does the cover material meet the requirements of Section 8.4 of the permit application? (12" of soil cover or durable plastic covering secured on all deges for active cells, 24" of soil cover for closed cells)				
2	Does the monofill cell construction reflect the typical design details in Appendix C of the permit application? (1.5H:1V side slopes, etc)				
3	Any settling, frost action, or erosion that compromises the integrity of the monofill excavation and/or surface water flow control measures?				
4	What is the general condition of the vegetative cover over closed sections?				
5	Any excess runoff or odors?				
6	Any evidence of leachate or waste escaping?				
7	Any unauthorized disposal?				
8	Any evidence of death or stress to wildlife or vegetation that might be caused by the facility?				
9	Any reports or evidence of disease vectors or wildlife access since last inspection?				
10	Any evidence of litter, odor, dust, noise, or other nuisances?				
11	Any other deficiencies per 18 AAC 60.800 that not specifically addressed above?				



# Dugout / Lagoon Volume Calculator

Measure length and width at the top of the dugout.

Length must be equal to or greater than the width.

Water depth must be equal to or less than depth of dugout.

Slope is the number of feet in the horizontal (run) direction for each foot in the vertical (rise) direction (eg. run/rise = 4 ft./1 ft.).

By entering the above information, this calculator will give you the capacity of the dugout and its contents in cubic feet, cubic yards, cubic meters, litres, Imperial and U.S. gallons. This is useful in determining the size of dugout necessary, estimating construction costs, and volumes remaining in the dugout.

Units :

Length of dugout:

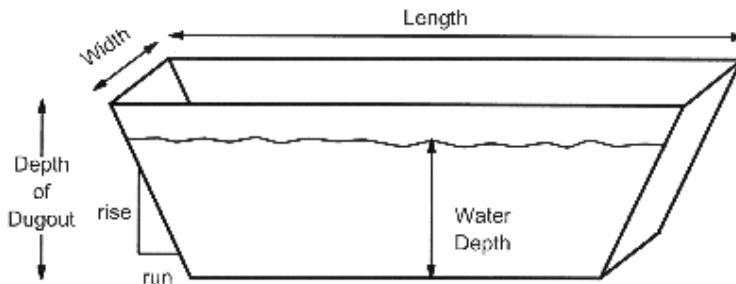
Width of dugout:

Depth of dugout:

Water depth (optional) :

End Slope (run/rise) :

Side Slope (run/rise) :



The dugout calculator uses the following formula for a prismoid to calculate the volume.

$$V = (d/6) \times (A_t + A_b + 4 A_m)$$

where

$$A_t = L \times W$$

$$A_b = (L - 2 \times ES \times d) (W - 2 \times SS \times d)$$

$$A_m = (L - ES \times d)(W - SS \times d)$$

definitions

V = Volume

d = depth of the dugout

A<sub>t</sub> = Area of the top of the dugout

A<sub>b</sub> = Area of the bottom of the dugout

A<sub>m</sub> = Area of the midsection of the dugout

SS = slope of the sides of the dugout

ES = slope of the ends of the dugout

L = Length of the top of the dugout

W = Width of the top of the dugout

## Dugout /Lagoon Volume Calculator - Results

The total volume of a dugout that is 80 feet long, 65 feet wide, 15 feet deep with a side slope of 1.5, an end slope of 1.5 is

The volume of water that is 13 feet deep is:

## METHOD 9095B

### PAINT FILTER LIQUIDS TEST

#### 1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

#### 2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

#### 3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25 °C.

#### 4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

#### 5.0 REAGENTS

5.1 None.

## 6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

## 7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

## 8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

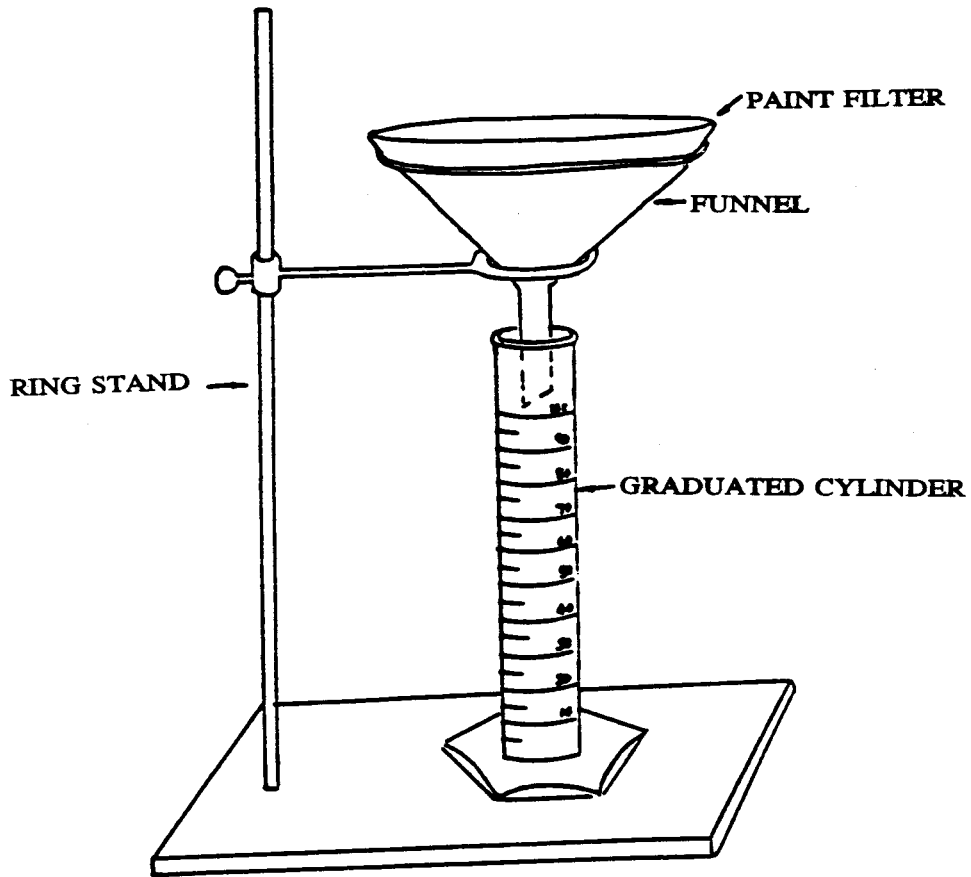
## 9.0 METHOD PERFORMANCE

9.1 No data provided.

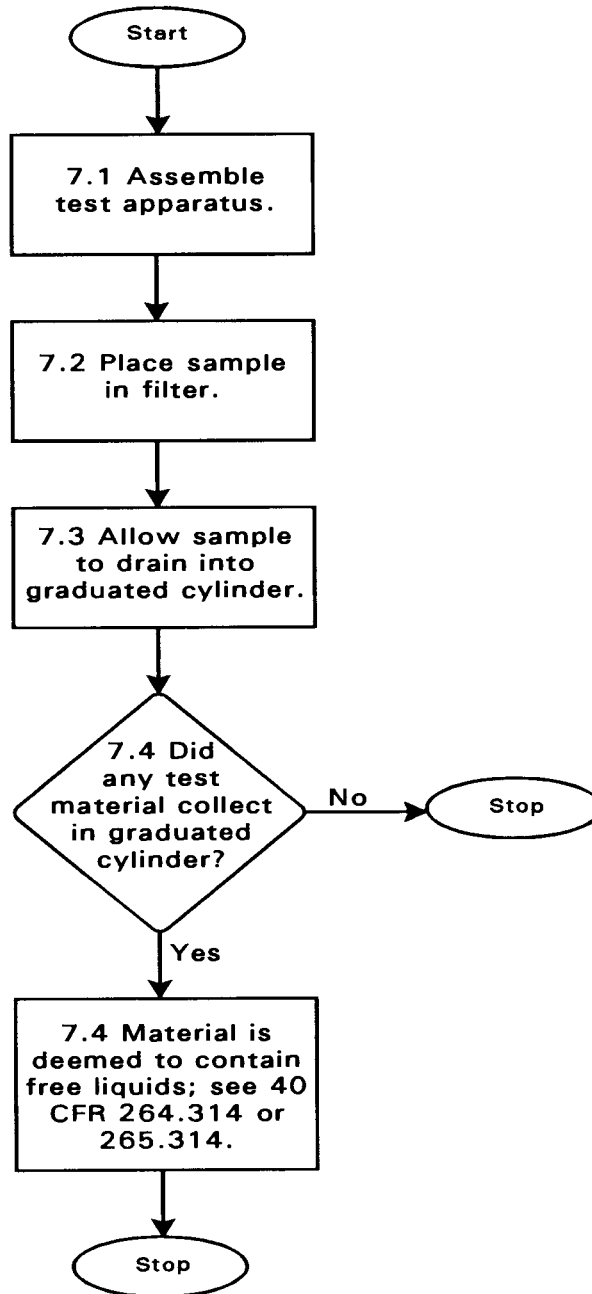
## 10.0 REFERENCES

10.1 None provided.

FIGURE 1  
PAINT FILTER TEST APPARATUS



METHOD 9095B  
PAINT FILTER LIQUIDS TEST





The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces  
through safety and health research / **NIOSH**

# Guidance For Controlling Potential Risks To Workers Exposed to Class B Biosolids

DHHS (NIOSH) PUBLICATION NUMBER 2002-149

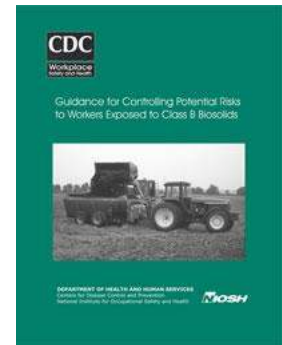
JULY 2002

**Note: This publication supercedes NIOSH Hazard ID, HID 10 – workers exposed to class B biosolids during and after field application**

This guidance is intended only for controlling health risks to workers from Class B biosolids during handling and land application. This guidance is not intended to address nonoccupational exposure.

## Introduction

Biosolids are the organic residues resulting from the treatment of commercial, industrial, and municipal wastewater (sewage). One purpose of the treatment is to significantly reduce the concentration of disease-causing organisms (also known as pathogens). Treatment also reduces the attractiveness of the residues to insects, birds, and rodents. The product is a material that can be recycled for uses such as adding organic material to the soil.



The U.S. Environmental Protection Agency (EPA) has established two categories of biosolids:

- Class A biosolids have undergone treatment to the point where the concentration of pathogens is reduced to levels low enough that no additional restrictions or special handling precautions are required by Federal regulations [40 CFR Part 503]. If the Class A biosolids meet exceptional quality requirements for metals content, they may be sold in bags and applied in the same way as other soil conditioners such as peat moss.
- Class B biosolids have undergone treatment that has reduced but not eliminated pathogens. By definition, Class B biosolids may contain pathogens. As a result, Federal regulations for use of Class B biosolids require additional measures to restrict public access and to limit livestock grazing for specified time periods after land application [40 CFR Part 503]. This allows time for the natural die-off of pathogens in the soil.

Whereas EPA rules [40 CFR Part 503] restrict public access to lands treated with Class B biosolids in order to protect public health, these rules do not apply to workers involved with Class B biosolids handling and land application.

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\*Code of Federal Regulations.

Workers may come in contact with Class B biosolids during the course of their work. Workers and employers may be well aware of the need for precautions when contacting untreated sewage but less aware of the need for basic precautions when using Class B biosolids. This document provides information, guidance, and recommendations to employers and employees working with Class B biosolids to minimize occupational risks from pathogens. It does not address other potential safety and health issues such as injuries or exposures to chemicals.

## How are biosolids used?

Biosolids are typically treated to Class B or Class A standards at the wastewater (sewage) treatment plant, where a liquid or semi-solid material is produced. In a liquid state, biosolids can be transported by truck to a land application site where they are applied directly to the land using tractors, tank wagons, irrigation systems, or special application vehicles. Alternatively, biosolids may undergo mechanical dewatering that may include the use of polymers. Dewatered and liquid biosolids are often temporarily stored at the treatment plant or application site. Dewatered biosolids are transported and applied to land using front-end loaders, trucks, tractors, or biosolids-spreading equipment. Most biosolids are applied with spreaders in semisolid form and then incorporated into the soil using a disc plow. Workers may come into either direct or indirect contact with biosolids during any phase of the treatment, transport, or application process, or after they are land applied. Currently, more than 50% of the biosolids generated in the United States is recycled as soil conditioners to improve and maintain productive soils and stimulate plant growth rather than being sent to landfills or incinerated. Biosolids are applied on agricultural land, forestlands, and surface mine reclamation sites. Class A biosolids are also used in horticultural applications. EPA estimates that 7.1 million tons of biosolids were generated for use or disposal in 2000.

## What is in biosolids that requires control of worker exposures?

There are four major types of human disease-causing organisms (pathogens) that can be found in sewage: (1) bacteria, (2) viruses, (3) protozoa, and (4) helminths (parasitic worms). Class B biosolids may contain the same types of pathogens as the source sewage, but at reduced concentrations. Both Class A and Class B biosolids may also contain chemicals (including metals) and allergens.

To protect public health, the EPA's 40 CFR Part 503 rule prescribes a restricted period of up to 1 year to limit public access to lands where Class B biosolids have been applied. These EPA restrictions do not apply to occupational access. EPA does recognize that occupational exposure can occur and states that workers exposed to Class B biosolids might benefit from several additional precautions such as use of dust masks when spreading dry materials, the use of gloves when touching biosolids, and routine hand washing before eating, drinking, smoking, or using the bathroom.

The risk of worker exposure to infectious agents in Class B biosolids is likely greatest prior to, during, and immediately after land application of the biosolids. Because the concentration of pathogens declines through natural processes, the potential for pathogen exposure decreases over time.

## Do we know these pathogens can cause disease?

Yes, the association between poor hygiene, raw sewage, and infectious disease is well established. Most of the pathogenic bacteria, viruses, and parasites in biosolids are enteric, which means they are present in the intestinal tracts of humans and animals. Enteric organisms that may be found in biosolids include, but are not limited to, *Escherichia coli*, *Salmonella*, *Shigella*, *Campylobacter*, *Cryptosporidium*, *Giardia*, Norwalk virus, and enteroviruses. Exposure may potentially result in disease (e.g., gastroenteritis) or in a carrier state in which an infection does not clinically manifest itself in the individual but can be spread to others. These enteric organisms are usually associated with self-limited gastrointestinal illness but can develop into more serious diseases in sensitive populations such as immune-compromised individuals, infants, young children, and especially the elderly.

The disease risk is a function of the number and types of pathogens in the Class B biosolids relative to the exposure levels and infective dose. Because data are sparse on what constitutes an infective dose, it is prudent public health practice to minimize workers' contact with Class B biosolids and soil or dusts containing Class B biosolids during production and application, and at land application sites during the period when public access is restricted. Class A biosolids may also present some health risk to workers, since some chemicals and biologic constituents in Class A biosolids are not regulated by the EPA.

## Can workers be exposed to pathogens from biosolids?

Workers could be exposed to pathogens and irritants when working with Class B biosolids during the period when public access is restricted. During a NIOSH field investigation at one biosolids land application and storage site that did not comply with EPA requirements, the following was observed:

- NIOSH interviewed employees who worked in all phases of the biosolids operation. Some employees reported repeated episodes of gastrointestinal illness after working with the biosolids, either at the treatment plant or during land application.
- NIOSH observed among workers an inconsistent awareness, provision, and use of protective equipment and hygiene practices appropriate for handling Class B biosolids (or biosolids that do not comply with EPA standards).
- NIOSH collected bulk samples from different locations within the biosolids storage site and found measurable concentrations of fecal coliforms. Fecal coliforms are used as an indicator for the presence of other enteric microorganisms. Enteric bacteria were detected in air samples collected at the land application site.
- The local department of environmental services recently informed NIOSH that biosolids applied at this site intermittently exceeded (by up to 4.5 times) the EPA fecal coliform upper limit for Class B biosolids prior to the NIOSH survey.
- The substandard biosolids were applied at the agricultural site before the monitoring results were received from the laboratory.

EPA reports that high-pressure spray applications may result in some aerosolization of pathogens and that application or incorporation of dewatered biosolids may cause very localized fine particulate/dusty conditions. Also, farm workers may be exposed to biosolids after application and during the restricted period. Ancillary workers (for example, laborers hired to clean trucks that were used to haul biosolids) can be exposed to biosolids. Exposures to substandard biosolids can occur when these materials are loaded and hauled to approved landfills or incinerators for disposal.

Additional study of worker exposures to pathogens and other toxics possibly present in Class B biosolids is needed. This will reduce scientific uncertainty about these issues and allow further refinement of worker precautions.

## What should employers do to prevent work-related illness?

To protect workers who have direct contact with Class B biosolids and thus are likely to have an exposure to pathogens, employers should provide a basic level of protection, including appropriate measures from those listed below. While the measures are worded to refer to Class B biosolids, most also apply to tasks involving contact with sewage, untreated or partially treated sludge, or substandard biosolids.

Provide basic hygiene recommendations for workers.

Basic hygiene precautions are important for workers handling biosolids. The following list, originally developed by EPA, provides a good set of hygiene recommendations.

1. Wash hands thoroughly with soap and water after contact with biosolids.
2. Avoid touching face, mouth, eyes, nose, genitalia, or open sores and cuts while working with biosolids.
3. Wash your hands before you eat, drink, or smoke and before and after using the bathroom.
4. Eat in designated areas away from biosolids-handling activities.
5. Do not smoke or chew tobacco or gum while working with biosolids.
6. Use barriers between skin and surfaces exposed to biosolids.
7. Remove excess biosolids from footgear prior to entering a vehicle or a building.
8. Keep wounds covered with clean, dry bandages.
9. Thoroughly but gently flush eyes with water if biosolids contact eyes.
10. Change into clean work clothing on a daily basis and reserve footgear for use at worksite or during biosolids transport.

11. Do not wear work clothes home or outside the work environment.
12. Use gloves to prevent skin abrasion.

In addition, NIOSH recommends the following steps to provide a more comprehensive set of precautions for use by employers and employees:

Provide appropriate protective equipment, hygiene stations, and training.

*Personal Protective Equipment (PPE).*—Appropriate PPE should be provided for all workers likely to have exposure to biosolids. The choices of PPE include goggles, splash-proof face shields, respirators, liquid-repellent coveralls, and gloves. Face shields should be made available for all jobs in which there is a potential for exposure to spray or high-pressure leaks, or aerosolized biosolids during land application. Management and employee representatives should work together to determine which job duties are likely to result in this type of exposure, to conduct appropriate on-site monitoring, and to determine which type of PPE is needed in conjunction with a qualified safety and health professional. If respirators are needed, a comprehensive program would include respirator fit-testing and training or retraining.

*Hygiene and Sanitation.*—Hand-washing stations with clean water and mild soap should be readily available whenever contact with biosolids occurs. In the case of workers in the field, portable sanitation equipment, including clean water and soap, should be provided. Cabs should be wiped down and cleaned of residual mud (or settled dust) frequently to reduce potential for exposure to biosolids.

*Training.*—Periodic training on standard hygiene practices for biosolids workers should be conducted by qualified safety and health professionals to cover issues such as the following:

- Frequent and routine hand washing (the most valuable safeguard in preventing infection by agents present in biosolids), especially before eating or smoking
- The proper use of appropriate PPE, such as coveralls, boots, gloves, goggles, respirators, and face shields
- The removal of contaminated PPE and the use of available on-site showers, lockers, and laundry services
- Proper storage, cleaning, or disposal of contaminated PPE
- Instructions that work clothes and boots should not be worn home or outside the immediate work environment
- Prohibition of eating, drinking, or smoking while working in or around biosolids
- Procedures for controlling exposures to chemical agents that may be in biosolids

*Reporting.*—Workers should be trained to report potentially work-related illnesses or symptoms to the appropriate supervisory or health care staff. This may aid in the early detection of work-related health effects.

*Immunizations.*—Ensure that all employees are up-to-date on tetanus-diphtheria immunizations, since employees are at risk of soil-contaminated injuries. Current CDC recommendations do not support hepatitis A vaccination for sewage workers.


Extend good environmental practices to prevent and minimize occupational exposures.

- Where feasible, substituting Class A biosolids could reduce the pathogen exposure risks during land application compared to applying Class B biosolids. Feasibility may be affected by local customer preferences, since the two types of biosolids vary in the nutrient value they provide to end-users.
- Monitor the source material coming from the wastewater treatment facility. Check monitoring results to assure they meet specified Class B or Class A standards prior to land application operations.
- Monitor stored biosolids prior to application to assure that the biosolids are properly stabilized and that unacceptable regrowth or cross-contamination from substandard material has not occurred.
- Where local conditions permit, inject biosolids below the soil or incorporate (thoroughly mix) into tilled soil. This will minimize post-application worker contact with applied biosolids and prevent resuspension into the air during periods of dryness.
- On windy days, avoid spreading or disturbing dry biosolids (e.g., compost) that would create dust.

- On windy days, avoid spreading biosolids by high-pressure spray.
- Avoid unnecessary mechanical disturbance and contact with land-applied Class B biosolids during the period when public access is restricted.
- Equip heavy equipment used at storage and application facilities with sealed, positive-pressure, air-conditioned cabs that contain filtered air-recirculation units.
- Monitor worker exposures when adjusting precautions to address site-specific issues.

## For More Information

Additional information about biosolids and preventive measures can be obtained from the following government Web sites:

- [Environmental Protection Agency \(EPA\): \*Biosolids\*](#).   
(The EPA site includes links to professional associations that address biosolids.)
- [National Center for Infectious Diseases \(NCID\): \*Viral Hepatitis Resource Center\*](#).

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