Skagway Drinking Water System
Public Water System (PWS)

DRINKING WATER SOURCE PROTECTION PLAN

PWSID #110601

Tim Gladden
Certified Water/Wastewater Superintendent
Phone: 907-983-2071

Scott Hahn, Borough Manager
Protection Plan Contact
Phone: 907-983-2297

Review and Update Annually

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Prepared with assistance from Charles F. Kaucic, Sr., Source Water Protection Specialist
Alaska Rural Water Association (ARWA)
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I. Management Plan

A. Drinking Water Source Protection Planning Team  
   (Individuals that contributed to the development of the plan)

   Tom Smith, Borough Manager; Emily Deach, Borough Clerk; Tim Gladden  
   Water/Wastewater Department Superintendent; Tyson Ames, Water Operator; A J  
   Conley, Taiya Inlet Watershed Council; Chuck Kaucic; Alaska Rural Water  
   Association (ARWA); Steve Burnham Jr., Borough Assembly Member

Implementation Team  
   (Individuals that will oversee the application of the plan and updating)

   Scott Hahn, Borough Manager; Tim Gladden, Water/Wastewater Superintendent;  
   Tyson Ames, Water Operator

B. Purpose

To meet the requirements of the Safe Drinking Water Act (SDWA) as amended in 1986 and 1996, Alaska developed a report titled Alaska’s Drinking Water Protection Program – Source Water Assessment and Wellhead [Drinking Water Source] Protection Plans that was approved by EPA in April, 2000. The plan describes a single program known as the Drinking Water Protection Program (DWPP) that meets all of the SDWA 1986 and 1996 Amendment requirements through three components: source water assessments of PWS, groundwater protection, and drinking water source protection.

While Alaska Department of Environmental Conservation (ADEC) is completing source water assessments for each public water system in Alaska, individual public water systems or local communities are encouraged to complete Drinking Water Source Protection Management Plans (Plan) that meet the specific needs of their public water system or community. This report is intended to meet the technical requirements for the completion of the Plan for The Municipality of Skagway Drinking Water System, Skagway, Alaska as required by the SDWA.

A Plan is designed to protect the groundwater used by communities from contamination. Appendix A of this Plan, “Source Water Assessment, A Hydrogeologic Susceptibility and Vulnerability Assessment for the Skagway Water System,” establishes protected areas overlying the aquifer yielding water to the well and extends up-gradient. The extent of the up-gradient protection area is
determined by modeling of the aquifer and projecting the well’s capture zone as determined for several months’ time of travel (Zone A) and two years travel time (Zone B). This long term planning is necessary to provide an early warning mechanism in the event of up-gradient contamination; however, preventing the contamination of a water supply through education and public awareness remains the primary goal.

Most instances of aquifer contamination become known when trace levels of a contaminant are detected through routine monitoring. Drinking water systems that have completed a Plan will have information on groundwater flow and aquifer characteristics; a detailed contaminant source inventory; and an implementation plan that determines the best response to ensure the continued quality of the water supply.

C. Community Overview

**Current Population:** 968 (2010 US Census)

**Incorporation Type:** 1st Class Borough

**Borough Located In:** Municipality of Skagway

**School District:** Skagway Borough School District

**Village Council:** Skagway Traditional Council

**Regional Native Corporation:** Sealaska Corporation

**Supporting Environmental Group:** Taiya Inlet Watershed Council

D. Influencing Factors

The Municipality of Skagway Drinking Water Source Protection Committee identified in Section A above worked on the formation of this plan. The major reason of the formation of this plan is protection of the Borough’s water source for the community of users and to minimize threats to the existing water source protection area. A strong desire to protect and maintain or improve on the current quality of Skagway’s drinking water supply is the favored goal of this plan.
Community awareness and education about the drinking water source within the watershed borders is a main focus of developing this plan. The possibility of fuel spills due to the railroad or recreational use of ATV’s in the water shed or a natural disaster such as a catastrophic flood are areas of concern to be addressed within this plan.

The primary goal of this plan is to establish a framework of implementable strategies to assist in protecting and preserving the quality of Skagway’s drinking water supply.

E. Geographic Setting and Description of the Aquifer

The Skagway River Valley is filled with unconsolidated sediments from the Pleistocene & Holocene age (Balding, 1975). Geophysical measurements near First Avenue in Skagway indicate that the unconsolidated sediments are about 585 feet in that part of the valley. At that location, 25 feet of alluvial deposits overlie about 120 ft of sandy deltaic deposits which are underlain by about 440 ft of glacial & glaciomarine deposits (Balding, 1975) Farther upriver (NE), alluvial deposits appear to be at least 50 to 65 ft thick. These deposits consist of sandy gravel & gravelly sand with cobble & boulder horizons. Grain size & layering within these sediments suggest that the alluvial sands & gravels were deposited bars & channel-fill deposits of a braided river. Assuming that the river gradient during deposition was similar to the present gradient of the Skagway River, bedding within the alluvial deposits should be approximately parallel to the ground surface. The conclusion is supported by the possible correlation of a cobble layer from City Well # 3 to monitoring well MW-1.

Location and Climate

Skagway is located 90 miles northeast of Juneau at the northernmost end of Lynn Canal, at the head of Taiya Inlet. It lies 108 road miles south of Whitehorse and is just west of the Canadian border with British Columbia. It lies at approximately 59.458330° North Latitude and -135.313890° West Longitude (Sec. 11, T028S, R059E, Copper River Meridian). The area encompasses 452.4 sq. miles of land and 11.9 sq. miles of water.

Skagway experiences a maritime climate with cool summers and mild winters. Average summer temperatures range from 45 to 67 °F; winter temperatures average 18 to 37 °F. Within the shadow of the mountains, Skagway receives less rain than is typical of Southeast Alaska, averaging 26 inches of precipitation per year and 39 inches of snow.
History, Culture and Demographics

Skagway was originally known by the Tlingits as Skagua, meaning "windy place"; it was used by the Chilkoots and Chilkats for hunting and fishing. In 1896, gold was discovered 600 miles away in the Yukon; Skagway acted as the starting-off point for prospectors. In 1897 a post office, a church, and a newspaper were founded in Skagway, and its population rose to 10,000. In 1900, Skagway became the first incorporated city in Alaska, beating Juneau by a day. The Bank of Alaska opened in Skagway in 1916. The first tourism boom began in the mid-1920s. During WWII, Skagway stationed as many as 3,000 troops, who worked to construct the Alcan Highway. There was a major flood of the Skagway River in 1967 that breached area dikes. The Klondike Highway to Dawson City opened in 1979. In 1994, the city dock collapsed and sent a tidal wave across the bay; the dock was rebuilt within the year. The city was dissolved in 2007 and became the first first-class borough in Alaska that same year.

A federally-recognized tribe is located in the community -- the Skagway Village. Skagway is predominantly a tourist community, with historical Tlingit influences. Downtown buildings have been colorfully restored to reflect the history of the gold rush through the Chilkoot Pass.

According to Census 2010, there were 590 housing units in the community and 410 were occupied. Its population was 3.7 percent American Indian or Alaska Native; 91 percent white; 0.5 percent Asian; 0.1 percent Pacific Islander; 4.2 percent of the local residents had multi-racial backgrounds. Additionally, 2.3 percent of the population was of Hispanic descent.

Facilities, Utilities, Schools and Health Care

Water is produced from three wells near 15th and Alaska Streets and is stored in a tank and piped throughout Skagway. Piped sewage receives primary treatment with an ocean outfall. Demands on the system nearly double each summer with the influx of tourism-business operators. Almost all homes are fully plumbed. Some houses use individual wells and septic systems. The landfill is closed; however, the Borough operates an incinerator, baler, and ash fill facility. The community participates in recycling and annual hazardous waste disposal events. Alaska Power & Telephone Company, based in Skagway, provides power to Southeast and the Interior. It owns and operates diesel and hydro systems in Skagway and diesel systems in Tok, Hydaburg, and Craig. Electricity is provided by Alaska Power Company.

There is one school located in the community, attended by 96 students.

Local hospitals or health clinics include Dahl Memorial Clinic. The clinic is a qualified Emergency Care Center. Itinerant care from Juneau's Bartlett Regional
Hospital. Emergency Services have limited highway marine air floatplane and helicopter access. Emergency service is provided by 911 Telephone Service and volunteers. Auxiliary health care is provided by Skagway Volunteer Fire Dept./EMS (907-983-2450/907-983-2300).

Economy

The tourist industry flourishes in Skagway as a port of call for cruise ships and a transfer site for rail and interior bus tours. Road travelers also visit the community. The Klondike Gold Rush Historical Park and White Pass and Yukon Railroad are major attractions. An Economic Impact Study conducted by the City of Skagway in 1999 found that 51% of the owners of visitor-related businesses are not year-round residents. Trans-shipment of lead/zinc ore, fuel, and freight occurs via the Port and Klondike Highway to and from Canada. In 2010, five residents held commercial fishing permits.

The 2005-2009 American Community Survey (ACS) estimated 664\(^1\) residents as employed. The public sector employed 19.9\(^1\) of all workers. The local unemployment rate was 10.8\(^1\). The percentage of workers not in labor force was 13.6\(^1\). The ACS surveys established that average median household income (in 2009 inflation-adjusted dollars) was $71,295 (MOE +/-$4,544)\(^1\). The per capita income (in 2009 inflation-adjusted dollars) was $32,801 (MOE +/-$7,210)\(^1\). About 9.3\(^1\) of all residents had incomes below the poverty level.

\(^1\) All ACS statistics are published with their respective margin of error (MOE). Some of the statistics here are calculated from the original ACS data. The MOE was unable to be carried through the calculations.

Transportation

The Klondike and Alaska Highways provide a connection through British Columbia and the Yukon Territory, Canada, to the lower 48 states or north to Interior Alaska. Skagway is accessed by air, road, and water services. The state owns the 3,550\(^\prime\) long by 75\(^\prime\) wide paved runway and a seaplane base at the boat harbor, with scheduled air taxis. Skagway receives regular state ferry and barge services. A breakwater, ferry terminal, cruise ship dock, small boat harbor, boat launch, and boat haul-out are available. The White Pass and Yukon Route Company owns two deep draft docks for cargo loading and storage. Freight arrives by barge, ferry, and truck.

Threats to the existing water supply can come from a multitude of potential sources; residential septic tanks, fuel storage/transfer, or former/current contaminated sites in the watershed.
F. The Public Drinking Water System and Source Wells

The community of Skagway is a Class A (community) water system located in Skagway, Alaska. The system consists of three wells within downtown Skagway. Well #1 is located on the corner of 15th Avenue & Main St. Wells #2 & #3 are located on the corner of 15th Avenue & Alaska St. The public water system lies in the Skagway River valley at an elevation of less than 20 feet above sea level. Additionally, the system has two 150,000 gallon storage tanks and the drinking water source is untreated. This Municipal system operates year round and serves approximately 968 residents & up to 14,000 seasonal visitors through 410 service connections.

The depths of the three wells are between 70 & 80 feet below the ground surface. They are all screened in a semi-confined aquifer consisting of large gravel & fine to coarse sands. The soils above the aquifer consist of gravelly clay till & cemented gravel. The wells’ static water levels are about 10 ft below the ground surface. Capacities are: Well #1 – 250 GPM; Well #2 – 250 GPM & Well #3 – 550 GPM.

G. Drinking Water Source Protection Area (DWPA)

The most probable area for contamination to reach the drinking water well is the area that contributes water to the well, the groundwater recharge area. This area is designated as the drinking water protection area (DWPA). Because releases of contaminants within the protection area are most likely to impact the drinking water well, this area will serve as the focus for voluntary protection efforts. An analytical calculation was used to determine the size and shape of the DWPA for the Skagway PWS. The most probable contaminants are surficial releases particularly within the immediate vicinity of the 3 wells. The wood chip pile located up gradient of the wells in the White Pass Yukon Route Railroad yard are equally susceptible and septic tanks and holding tanks across the bridge are the most prevalent concerns.
H. Contaminant Source Inventory

The DEC Contaminant Source Inventory description, tables and maps are included in Appendix A.

I. Contaminated Sites Program; Database Inventory (Appendix C)

There were 12 total files (sites) with 4 in open status for the Skagway area. All sites are within the drinking Water Protection area.

J. Strategies for Implementation

The following implementation plan was developed based on community input during the planning workshop, and following meetings. The items are NOT placed in priority and several could be pursued at once.
## Drinking Water Source Management Implementation Plan

<table>
<thead>
<tr>
<th>#</th>
<th>Contamination Type/Concern</th>
<th>Zone Area</th>
<th>Risk Level</th>
<th>Protection Tool</th>
<th>Strategy</th>
<th>Schedule</th>
<th>Implementation Date/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All</td>
<td>Area wide</td>
<td>N/A</td>
<td>Taiya Inlet Watershed Council</td>
<td>Continue involving the Assembly in all environmental activities</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>All</td>
<td>Area wide</td>
<td>Mod.</td>
<td><strong>Public education of Source Water Protection Zone:</strong></td>
<td>Research available tools and begin planning methods of outreach, such as the Alaska Jr Water Ranger program &amp; school curriculum activities, watershed information display board, and CCR stuffers.</td>
<td>Immediately</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>All</td>
<td>Area wide</td>
<td>Mod.</td>
<td><strong>Public education of Source Water Protection Zone boundaries:</strong></td>
<td>Post Drinking Water Source Protection Area signs to mark boundary and a map of the protection boundary on an existing sign/kiosk.</td>
<td>Immediately</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Approved backflow Boiler Assemblies</td>
<td>All facilities</td>
<td>Med</td>
<td>Design Standards: Zoning Ordinance</td>
<td>Require all boiler water feed lines to have an approved backflow assembly installed.</td>
<td>Present – 1 year</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>All</td>
<td>A</td>
<td>Mod</td>
<td><strong>Public education of Source Water Protection Zone:</strong></td>
<td>Conduct annual school outreach programs to include tour of water treatment plant and overview of process and operations within municipality’s water system.</td>
<td>1 year; on-going</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Contaminated Sites</td>
<td>Area Wide</td>
<td>Mod</td>
<td>Contaminated Sites Program; Database Inventory</td>
<td>Coordinate efforts with the state DEC contaminated sites program to review and update the contaminated sites database inventory for the purpose of reducing and or closing out open/active sites.</td>
<td>1 year; on-going</td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Problem Description</td>
<td>Priority</td>
<td>Area</td>
<td>Mod</td>
<td>Best Management Practices</td>
<td>Details</td>
<td>Status</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>------</td>
<td>-----</td>
<td>---------------------------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>7</td>
<td>Septic effluent Area Wide Mod</td>
<td></td>
<td></td>
<td></td>
<td>Public education of Best Management Practices: preventive maintenance</td>
<td>Public information on proper care &amp; maintenance of existing systems. Letter or mailing stuffers to be created for distribution</td>
<td>1 year; ongoing</td>
</tr>
<tr>
<td>8</td>
<td>Contaminated wood chip pile site in watershed A High</td>
<td></td>
<td></td>
<td></td>
<td>Best Management Practices: Prevention</td>
<td>Monitor progress of DEC directed cleanup of covered wood chip pile site to prevent spread of contamination.</td>
<td>Upon issue - 1 year</td>
</tr>
<tr>
<td>9</td>
<td>Inadequate Backflow devices Area Wide High</td>
<td></td>
<td></td>
<td></td>
<td>Design Standards: Best Management Practices, Backflow Prevention</td>
<td>Require installation of approved backflow devices on existing &amp; future commercial &amp; industrial facilities.</td>
<td>1-3 years</td>
</tr>
<tr>
<td>10</td>
<td>Increase system capacity Area Wide High</td>
<td></td>
<td></td>
<td></td>
<td>Design Standards: Best Management Practices, Supply</td>
<td>Due to need to cut off filling of cruise ships while water storage tanks recover. Obtain funding for installation of new well #4 &amp; a new 250,000 gallon redwood storage tank.</td>
<td>1-3 years</td>
</tr>
<tr>
<td>11</td>
<td>Improperly abandoned wells Area Wide Mod</td>
<td></td>
<td></td>
<td></td>
<td>Well Decommissioning</td>
<td>Inventory unknown sites; decommission improperly abandoned wells located in Drinking Water Protection Area. Securing potential grants for properly closing out public and private wells. Use methods published in Water Wells, Appendix H (AWWA 2006) or alternate method approved by DEC. See DEC DW Regs 18 AAC 80.015; consider mailer to request/collect data from residents</td>
<td>1-3 years</td>
</tr>
<tr>
<td>12</td>
<td>All Area Wide Mod</td>
<td></td>
<td></td>
<td></td>
<td>Water Rights application filled with the State of Alaska DNR</td>
<td>A “certificate of appropriation” (water rights) will ensure the applicant to have legal standing to assert those rights against conflicting water users who do not have water rights.</td>
<td>3 issued; 2 are pending</td>
</tr>
</tbody>
</table>
K. Other Priorities and Strategies for Implementation:

- Respond & follow up to the two pending Water Rights applications filed with the State of Alaska DNR; contact Ted Deats

**Pending: LAS 26586 & 26587**

- A “certificate of appropriation” (water rights) will ensure the applicant to have legal standing to assert those rights against conflicting water users who do not have water rights.
- A person with water rights has priority to use water over persons who later file for water rights from the same source.

**NOTE:** Skagway has 3 water rights issued:

  ADL #'s- 43985, 43986, 43987

- Calcium Storage – Municipal storage, mixed pile storage & State DOT for Highways, State roads & Airport
  - Work to install containment to prevent runoff into water system

- Car & Bus washing – educate public & businesses to dangers of non-point source pollution caused by discharge of detergents.

- Fertilizer & herbicide use at School – work to establish a formal agreement with school staff to submit an MSDS to Water staff for approval.

- Lawn care products use – issue an annual, seasonal general op ed

L. Implementation and Endorsement:

As illustrated in the previous table (Section I.), the Skagway Drinking Water Source Protection Committee (identified by Section A above) through workshops, meetings with local officials, and referencing the water system’s Source Water Assessment, have identified numerous areas of concern and risks throughout the course of the planning period, as well as strategies to improve drinking water source protection. Some of these strategies can be addressed immediately while other protection strategies will span over longer periods. For these reasons this plan is intended to be updated on an annual basis or as new information becomes available. While the State of Alaska Department of Environmental Conservation (DEC) currently does not require a drinking water source water protection program, having an Endorsed Drinking Water Protection Plan is promoted by the State through incentives for communities and water systems to proactively protect their drinking water source. Communities and water systems may qualify for
current and future incentives, such as grants and reduced sanitary survey frequency, if they have a State of Alaska Endorsed Drinking Water Protection Plan. There are several methods for State endorsement, including:

**Formal written plan meeting the following criteria:**
- A description of the planning team participants' roles and responsibilities.
- A delineation of the drinking water source protection area (already completed by DEC in the Source Water Assessment).
- An inventory of potential sources of contamination that includes a plan for routine and regular updates (already completed by DEC in the Source Water Assessment).
- A summary of the deficiencies affecting source water noted within the 2007 sanitary survey and action plans to correct the deficiencies.
- A summary of management tools and protection strategies that will be pursued to manage potential sources of contamination.
- Prioritization and implementation plan for protection strategies.
- A contingency plan or Emergency Response Plan (ERP) identifying alternative water sources.
- Planning team identifies a timeframe to review and regularly update the plan (recommend annually).

A community/water system has an ordinance/agreement or a well-defined protection program and formally requests their community/water system be considered for Endorsement by the State of Alaska:

**Protection Program:** A program that identifies prioritizes and establishes activities (a minimum of 2) to mitigate the risk of potential contaminant sources within the drinking water protection area. For example, public education, backhaul programs, hazardous waste recycling, purchase of property or rights to develop, water conservation, and community involvement.

**Agreements:** Written agreement between community water system and other entities that directly or indirectly contribute to the protection of public drinking water sources. For example, land use restrictions.

**Regulatory Measures:** Active and enforceable ordinances requiring regulatory protection activities within a drinking water protection area such as zoning
ordinances, subdivision ordinances, site plan review, design standards and operating standards (Best Management Practices).

It is a recommendation of this plan that the Skagway Drinking Water System request this plan be considered for endorsement by DEC. For assistance the DEC contact is Charley Palmer, Environmental Program Specialist, 907-269-0292

II. Contingency Plan

A. Purpose

The contingency plan identifies the principal threats to the source water, designates an emergency response coordinator, describes a series of potential response scenarios planned in the event the drinking water source is threatened or contaminated, and describes a plan for an alternate source of water in the event the drinking water source is permanently disabled.

B. Possible Threats

<table>
<thead>
<tr>
<th>Risks</th>
<th>Responsible Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spills from vehicles &amp; transport trucks.</td>
<td>Owner</td>
</tr>
<tr>
<td>Possible fuel spill from fuel distribution facilities</td>
<td>Private Operators</td>
</tr>
<tr>
<td>Leaks from above ground fuel storage tanks</td>
<td>Owner</td>
</tr>
<tr>
<td>Residential on-site septic tanks/drain fields and outhouses</td>
<td>Owner</td>
</tr>
<tr>
<td>Vandalism</td>
<td>Owner</td>
</tr>
<tr>
<td>Natural disasters:</td>
<td>Owner</td>
</tr>
<tr>
<td>o Earthquake</td>
<td>Owner</td>
</tr>
<tr>
<td>o Wind event</td>
<td>Owner</td>
</tr>
<tr>
<td>o Freezing water lines</td>
<td>Owner</td>
</tr>
<tr>
<td>o Wild fires</td>
<td>Land owner</td>
</tr>
<tr>
<td>o Flooding</td>
<td>Owners</td>
</tr>
<tr>
<td>Leaks from above ground fuel storage tanks or generators</td>
<td>Owner</td>
</tr>
</tbody>
</table>
C. **Emergency Coordination**

The emergency coordinator for the Skagway Drinking Water System is the Mayor; the contact phone number is: **907-983-2297**.

The backup emergency coordinator is the Deputy Mayor: the contact phone number is: **907-983-2297**.

The emergency coordinator is familiar with the borough and state DEC procedures and is responsible for contacting the appropriate officials should a spill or other threat to the public drinking water source occur.

**Where to Report a Spill**

**During normal business hours** call the nearest DEC Area Response Team Office or fax a completed spill report form to the nearest DEC Area Response Team Office.


<table>
<thead>
<tr>
<th>Area</th>
<th>Phone</th>
<th>FAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast (Juneau)</td>
<td>465-5340</td>
<td>465-2237</td>
</tr>
</tbody>
</table>

D. **Emergency Procedures**

Imminent threat = immediately shut down pumps.

Important valves and switches should be tagged and labeled to expedite the shut-down process.

1. Turn off main control box power switch.
   
a. Use lock out system.

2. Close main intake water valve to storage tank
   
a. Use lock out system.

3. Call Water Superintendent or Water Operator on duty.

4. Start the testing procedure to determine where the contaminant is in the system, and what components are impacted.
Important valve locations need to be tagged and noted on a building floor plan map and posted in water plant. A copy of the locations should be placed in the Appendix of this plan.

Under ideal conditions, the system can operate without the well by using water from the water storage tank for approximately 15 days.

E. Emergency and Alternate Water Sources

If the wells are out of service for more than 15 days, an emergency supply of water may need to be arranged. The short-term plan is to haul water from the river, and wells around town.

Should a total loss of water occur, the services of a design engineer and well driller will need to be retained to assess the options. Plans and specifications for any new well will require DEC, Drinking Water and Wastewater Program review and approval prior to construction.

F. Communication Plan

The nature of the public drinking water system must allow the wells to be isolated from the distribution system in the event of a spill that threatens the source water quality in Zone A of the Wellhead Protection Area. If it is determined that the source water was exposed to a contaminant, the appropriate well will remain off-line until sampling proves the water to be safe, and an evaluation done in cooperation with the Alaska Department of Environmental Conservation is completed.

The water emergency will be communicated to the public using one or more of the following techniques:
- Door-to-door
- Phone call list
- Public Postings on information bulletin board
- Using the emergency response vehicle PA system
- On-Air broadcast
APPENDIX A

SOURCE WATER ASSESSMENT, A HYDROGEOLOGIC SUSCEPTIBILITY AND VULNERABILITY ASSESSMENT FOR THE SKAGWAY DRINKING WATER SYSTEM, SKAGWAY, ALASKA
Source Water Assessment

A Hydrogeologic Susceptibility and Vulnerability Assessment for the Skagway Water System
Skagway, Alaska
PWSID 110601

October 2004
Source Water Assessment for the
Skagway Water System
Skagway, Alaska
PWSID 110601

October 2004

DRINKING WATER PROTECTION PROGRAM REPORT #: 1568

The Drinking Water Protection Program (DWPP) is producing Source Water Assessments in compliance with the Safe Drinking Water Act Amendments of 1996. Each assessment includes a delineation of the source water area, an inventory of potential and existing contaminant sources that may impact the water, a risk ranking for each of these contaminants, and an evaluation of the potential vulnerability of these drinking water sources.

These assessments are intended to provide public water systems owners/operators, communities, and local governments with the best available information that may be used to protect the quality of their drinking water. The assessments combine information obtained from various sources, including the U.S. Environmental Protection Agency, Alaska Department of Environmental Conservation (ADEC), public water system owners/operators, and other public information sources. The results of this assessment are subject to change if additional data becomes available. It is anticipated this assessment will be updated every five years to reflect any changes in the vulnerability and/or susceptibility of public drinking water source. If you have any additional information that may affect the results of this assessment, please contact the Program Coordinator of DWPP, (907) 269-7521.
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</thead>
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<td>Rank of Contaminant Risks</td>
</tr>
<tr>
<td>1</td>
<td>Vulnerability of Skagway Water System</td>
</tr>
<tr>
<td>1</td>
<td>Drinking Water System</td>
</tr>
<tr>
<td>1</td>
<td>References</td>
</tr>
</tbody>
</table>

TABLE

<table>
<thead>
<tr>
<th>TABLE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Definition of Zones</td>
<td>2</td>
</tr>
<tr>
<td>2. Susceptibility</td>
<td>3</td>
</tr>
<tr>
<td>3. Contaminant Risks</td>
<td>3</td>
</tr>
<tr>
<td>3. Overall Vulnerability</td>
<td>4</td>
</tr>
</tbody>
</table>

APPENDICES

APPENDIX

A. Skagway Water System Drinking Water Protection Area (Map 1)
B. Contaminant Source Inventory and Risk Ranking for Skagway Water System (Table 1-7)
C. Skagway Water System Potential Contaminant Sources (Map 2)
D. Vulnerability Analysis for Contaminant Source Inventory and Risk Ranking for Skagway Water System Public Drinking Water Source (Charts 1 – 14)
EXECUTIVE SUMMARY

This source water assessment provides an evaluation of the vulnerability to potential contamination of the public water system serving Skagway Water System. This Class A (community) water system consists of three wells in downtown Skagway, Alaska. The water system received a natural susceptibility rating of Very High. This rating is a combination of a susceptibility rating of Very High for the actual wellhead and a High rating for the aquifer in which the well is drawing water from. Identified potential and current sources of contamination for the Skagway Water System public water system include: sewer lines, residential areas, fuel storage tanks, roads, a campground, a rail corridor and yard, foot trails, and DEQ-recognized contaminated sites. These are considered as a source of bacteria and viruses, nitrates and/or nitrites, volatile organic chemicals, heavy metals, cyanide and other inorganic chemicals, synthetic organic chemicals, and other organic chemicals. Combining the natural susceptibility of the well with the contaminant risk, the public water system for Skagway Water System received an overall vulnerability rating of Very High for bacteria and viruses, High for nitrates and/or nitrites, volatile organic chemicals, synthetic organic chemicals, and Medium for heavy metals, cyanide, and other inorganic chemicals. This assessment can be used as a foundation for local voluntary protection efforts as well as a basis for the continuous efforts on the part of the Skagway Water System to protect public health.

SKAGWAY PUBLIC DRINKING WATER SYSTEM

The Skagway Water System public water system is a Class A (community) water system. The system consists of three wells within downtown Skagway, Alaska (Copper River Meridian, T28S, R59E, Section 12) (See Map 1 of Appendix A). Well #1 is located on the corner of 15th Avenue and Main Street, and well #2 and well #3 are located on the corner of 15th Avenue and Alaska Street. Skagway is located 90 miles northeast of Juneau at the northernmost end of Lynn Canal, at the head of Taiya Inlet.

The Skagway Water System public water system lies in the Skagway River valley at an elevation of less than 20 feet above sea level.

Most residents of Skagway use the city's piped water and sewer system although some use individual wells and septic systems (ADCD, 2002). Most residents use fuel oil to heat their homes and businesses, and the remainder use either wood, bottled gas, or another source (ADCD, 2002). The community operates an incinerator, and participates in recycling and annual hazardous waste disposal events for disposal of refuse (ADCD, 2002).

The depths of the wells vary between 70 and 80 feet below the ground surface. They are all screened in a semi-confined aquifer consisting of large gravel and fine to coarse sands. The soils above the aquifer consist of gravelly clay till and cemented gravel. The static water level in the wells is about 10 feet below the ground surface.

The Skagway Water System public drinking water system serves approximately 862 residents and 600 non-residents through 410 service connections.

SKAGWAY WATER SYSTEM DRINKING WATER PROTECTION AREA

The pathways most likely for surface contamination to reach the groundwater are identified as the first step in determining a drinking water system's risk. These areas are determined by looking at the characteristics of the soil, groundwater, aquifer, and well.

The most probable area for contamination to reach the drinking water wells is the area that contributes water to the well, the groundwater capture zone. The groundwater capture zone is located in the area circling the well (the area influenced by pumping) and also the area of the water table upgradient of the well, usually forming a parabola shape.

There are many different ways of calculating the size of capture zones. This assessment uses a combination of two simple groundwater flow equations, the Thiem and uniform flow equations for all groundwater wells screened in unconsolidated material. The orientation of the capture zone is then drawn using a water table elevation map (if available) or a land surface elevation map of the area. The capture zone calculated in this assessment is only a best guess using the information and resources available to us, and may differ slightly from the actual capture zone.
The parameters used to calculate the shape of this capture zone are general for the area and were obtained from area well logs in the area and the Groundwater textbook by Freeze and Cherry (Freeze and Cherry, 1979).

Only limited information is available for the aquifer Skagway Water System’s public water system well draws its water from. The orientation of the capture zone was drawn based on the assumption that groundwater flow direction is generally the same direction as the topography.

Because of uncertainties and changing site conditions, a factor of safety is added to the groundwater capture zone to form the drinking water protection area for the well.

The protection areas established for wells are usually separated into four zones, limited by the watershed. These zones correspond to times of travel (TOT) of the water moving through the aquifer to the well (plus the factor of safety).

The following is a summary of the four zones for wells and the calculated time-of-travel for each:

Table 1. Definition of Zones

<table>
<thead>
<tr>
<th>Zone</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>¼ the distance for the 2-yr. time-of-travel</td>
</tr>
<tr>
<td>B</td>
<td>Less than 2 years time-of-travel</td>
</tr>
<tr>
<td>C</td>
<td>Less than 5 years time-of-travel</td>
</tr>
<tr>
<td>D</td>
<td>Less than 10 years time-of-travel</td>
</tr>
</tbody>
</table>

The time of travel for contaminants within the water varies with their unique physical and chemical characteristics.

The drinking water protection area outlined for the Skagway Water System on Map 1 of Appendix A will serve as the focus for voluntary protection efforts.

INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES

The Drinking Water Protection Program (DWPP) has completed an inventory of potential and existing sources of contamination within the Skagway Water System protection area. This inventory was completed through a search of agency records and other publicly available information. Potential drinking water contaminants are found within agricultural, residential, commercial, and industrial areas, but can also occur within areas that have little or no development.

For the basis of all Class A public water system assessments, six categories of drinking water contaminants were inventoried. They include:

- Bacteria and viruses;
- Nitrate and/or nitrites;
- Volatile organic chemicals;
- Heavy metals, cyanide, and other inorganic chemicals;
- Synthetic organic chemicals; and
- Other inorganic chemicals.

The sources are displayed on Map 2 of Appendix C and summarized in Table I of Appendix B.

RANKING OF CONTAMINANT RISKS

Once the potential and existing sources of contamination have been identified, they are each assigned a ranking according to what type and level of risk they represent. Ranking of contaminant risks for a "potential" or "existing" source of contamination is a combination of toxicity and volume associated with that source. Rankings include:

- Low;
- Medium;
- High; and
- Very High.

Bacteria and Viruses are only inventoried in Zones A and B because of their short life span. Only "Very High" and "High" rankings are inventoried within the outer Zone D due to the probability of contaminant dilution by the time the contaminants get to the well.

Tables 2 through 7 in Appendix B contain the ranking of inventoried potential and existing sources of contamination with respect to the six contaminant categories.

VULNERABILITY OF SKAGWAY WATER SYSTEM DRINKING WATER SYSTEM

Vulnerability of a drinking water source to contamination is a combination of two factors:

- Natural susceptibility; and
- Contaminant risks.

Appendix D contains fourteen charts, which together form the 'Vulnerability Analysis' for a source water assessment for a public drinking water source. Chart 1 analyzes the 'Susceptibility of the Wellhead' to contamination by looking at the construction of the well and its surrounding area. Chart 2 analyzes the 'Susceptibility of the Aquifer' to contamination by looking at the properties of the aquifer and the presence of other wells or boreholes in the area. Chart 3 analyzes 'Contaminant Risks' for the drinking water source with respect to Bacteria and Viruses. The "Contaminant Risks" portion of the analysis considers potential sources of contaminants as well as a review of
the water system's contaminant sample results. Lastly, Chart 4 combines the results of the first three charts to produce the 'Vulnerability Analysis for Bacteria and Viruses'. Charts 5 through 14 contain the Contaminant Risks and Vulnerability Analyses for nitrates and nitrites, volatile organic chemicals, heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals, and other organic chemicals, respectively.

A score for the Natural Susceptibility is reached by considering the properties of the well and the aquifer.

Susceptibility of the Wellhead (0 – 25 Points)  
(Chart 1 of Appendix D)

+ 

Susceptibility of the Aquifer (0 – 25 Points)  
(Chart 2 of Appendix D)

= 

Natural Susceptibility (Susceptibility of the Well)  
(0 – 50 Points)

A ranking is assigned for the Natural Susceptibility according to the point score:

<table>
<thead>
<tr>
<th>Natural Susceptibility Ratings</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 to 50 pts</td>
<td>Very High</td>
</tr>
<tr>
<td>30 to &lt; 40 pts</td>
<td>High</td>
</tr>
<tr>
<td>20 to &lt; 30 pts</td>
<td>Medium</td>
</tr>
<tr>
<td>&lt; 20 pts</td>
<td>Low</td>
</tr>
</tbody>
</table>

The wellheads for the Skagway Water System received a Very High Susceptibility rating. All three of the wells are located within the floodplain of the Skagway River. Flood waters have the ability to quickly transfer large amounts on contaminants existing on the surface down through the well into the groundwater. The 6/17/02 Sanitary Survey indicates each well is capped with a sanitary seal and the land surface is sloped away from each of the wells; however none of the wells are grouted. A sanitary seal prevents potential contaminants from entering the well from the inside while grouting helps to prevent potential contaminants from traveling down the outside of the well casing.

The aquifer the Skagway Water System well is completed in received a High Susceptibility rating. Although the soils above the aquifer in the area provide some protection from surface contaminants, the shallow water table allows potential contaminants to come into contact with the water table with little natural filtering where they can disperse quickly. If private wells exist in the area, they can also provide a quick pathway for contaminants to travel down into the aquifer if the wells are not grouted correctly. Table 2 summarizes the Susceptibility scores and ratings for Skagway Water System.

<table>
<thead>
<tr>
<th>Table 2. Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susceptibility of the Wellhead</td>
</tr>
<tr>
<td>Susceptibility of the Aquifer</td>
</tr>
<tr>
<td>Natural Susceptibility</td>
</tr>
</tbody>
</table>

The Contaminant Risk has been derived from an evaluation of the routine sampling results of the water system and the presence of potential sources of contamination. Contaminant risks to a drinking water source depend on the type and distribution of contaminant sources. Flow charts are used to assign a point score, and ratings are assigned in the same way as for the natural susceptibility:

<table>
<thead>
<tr>
<th>Contaminant Risk Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 to 50 pts</td>
</tr>
<tr>
<td>30 to &lt; 40 pts</td>
</tr>
<tr>
<td>20 to &lt; 30 pts</td>
</tr>
<tr>
<td>&lt; 20 pts</td>
</tr>
</tbody>
</table>

Table 3 summarizes the Contaminant Risks for each category of drinking water contaminants.

<table>
<thead>
<tr>
<th>Table 3. Contaminant Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>Bacteria and Viruses</td>
</tr>
<tr>
<td>Nitrates and/or Nitrites</td>
</tr>
<tr>
<td>Volatile Organic Chemicals</td>
</tr>
<tr>
<td>Heavy Metals, Cyanide, and Other Inorganic Chemicals</td>
</tr>
<tr>
<td>Synthetic Organic Chemicals</td>
</tr>
<tr>
<td>Other Organic Chemicals</td>
</tr>
</tbody>
</table>

Finally, an overall vulnerability score is assigned for each water system by combining each of the contaminant risk scores with the natural susceptibility score:
Natural Susceptibility (0 – 50 points) + Contaminant Risks (0 – 50 points) = Vulnerability of the Drinking Water Source to Contamination (0 – 100).

Again, rankings are assigned according to a point score:

<table>
<thead>
<tr>
<th>Overall Vulnerability Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 to 100 pts</td>
</tr>
<tr>
<td>60 to &lt; 80 pts</td>
</tr>
<tr>
<td>40 to &lt; 60 pts</td>
</tr>
<tr>
<td>&lt; 40 pts</td>
</tr>
</tbody>
</table>

Table 4 contains the overall vulnerability scores (0 – 100) and ratings for each of the six categories of drinking water contaminants. Note: scores are rounded off to the nearest five.

Table 4. Overall Vulnerability

<table>
<thead>
<tr>
<th>Category and Viruses</th>
<th>Score</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria and Viruses</td>
<td>90</td>
<td>Very High</td>
</tr>
<tr>
<td>Nitrates and/or Nitrites</td>
<td>60</td>
<td>High</td>
</tr>
<tr>
<td>Volatile Organic Chemicals</td>
<td>75</td>
<td>High</td>
</tr>
<tr>
<td>Heavy Metals, Cyanide, and Other Inorganic Chemicals</td>
<td>50</td>
<td>Medium</td>
</tr>
<tr>
<td>Synthetic Organic Chemicals</td>
<td>60</td>
<td>High</td>
</tr>
<tr>
<td>Other Organic Chemicals</td>
<td>70</td>
<td>High</td>
</tr>
</tbody>
</table>

Bacteria and Viruses

The sewer lines are the greatest risk of bacteria and viruses to this water system.

Only a small amount of bacteria and viruses are required to endanger public health. Coliforms (a bacterium) are found naturally in the environment and although they aren’t necessarily a health threat, it is an indicator of other potentially harmful bacteria in the water, more specifically, fecal coliforms and E. coli which only come from human and animal fecal waste (EPA, 2002). Harmful bacteria can cause diarrhea, cramps, nausea, headaches, or other symptoms (EPA, 2002). Routine sampling has most recently detected coliforms in the water on 7/30/03 (verified on 8/5/03). Fecal coliform and E. Coli were not detected in the water.

After combining the contaminant risk for bacteria and viruses with the natural susceptibility of the well, the overall vulnerability of the well to contamination is very high.

Nitrates and Nitrites

The sewer lines also represent the greatest risks of nitrates and nitrites to this water system.

Nitrates are very mobile, moving at approximately the same rate as water. Nitrates have been detected in significant concentrations in the water for the Skagway Water System.

After combining the contaminant risk for nitrates and nitrites with the natural vulnerability of the well, the overall vulnerability of the well to contamination is high.

Volatile Organic Chemicals

The railroad yard and the DEC-recognized contaminated sites represent the greatest risk of volatile organic chemical contamination to the well.

There are three DEC-recognized contaminated sites located within the protection area. The ADEC Contaminated Sites program identifies, assesses, and ensures cleanup of contaminated sites based on their prioritized order. Priority is based on risk to human health and the environment, including risk to public drinking water wells. Specific information on each of these sites can be found on the internet at [http://www.dec.state.ak.us/spar/cs/search/csites/search.asp](http://www.dec.state.ak.us/spar/cs/search/csites/search.asp).

Trichloroethylene was detected most recently on 12/30/03 at a concentration of 0.00083 mg/L or 17% of its Maximum Contaminant Level (MCL). An MCL is the concentration of a contaminant allowed in the drinking water by the Environmental Protection Agency (EPA). Trichloroethylene was also detected on 12/16/02 and 11/27/00 at around the same concentration as the result on 12/30/03. 1,1,2-Trichloroethene, Dichloromethane, and Tetrachloroethylene have also been detected but in very low concentrations with respect to their MCLs. No other volatile organic chemicals have been detected recently.

After combining the contaminant risk for volatile organic chemicals with the natural vulnerability of the well, the overall vulnerability of the well to contamination is high.

Heavy Metals, Cyanide, and Other Inorganic Chemicals

Again, the sewer lines represent the greatest risk of heavy metals, cyanide, and other inorganic chemicals identified for this water system.

Arsenic, Barium, Chromium, Fluoride, and Nickel have all been detected in this water system but in concentrations well below their respective MCLs. No other heavy metals have been detected during recent routine sampling.
After combining the contaminant risk for heavy metals, cyanide and other inorganic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

**Synthetic Organic Chemicals**

The rail corridor and railroad yard represent the greatest risk of synthetic organic chemicals to this public water system.

No synthetic organic chemicals were detected during the most recent sampling on 1/25/93.

After combining the contaminant risk for synthetic organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is high.

**Other Organic Chemicals**

The railroad yard also represents the greatest risk of other organic chemicals for this source of public drinking water.

No other organic chemicals have been sampled for in this water system.

After combining the contaminant risk for other organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is high.
REFERENCES


APPENDIX A

Skagway Water System
Drinking Water Protection Area Location Map
(Map 1)
Map 1: City of Skagway - Drinking Water Protection Areas

PWSID: 110601

Data Sources:
- Background Image: USGS 1:63,000 mapping
- Lakes, streams, & roads: U.S. Forest Service, Tongass

Legend:
- City of Skagway - wells
- Zone A Protection Area
- Zone B Protection Area
- Zone C Protection Area
- Zone D Protection Area

Protection Zones for the City of Skagway were delineated based upon watershed area and groundwater flow information.
APPENDIX B

Contaminant Source Inventory and Risk Ranking for Skagway Water System
(Tables 1-7)
<table>
<thead>
<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID tag</th>
<th>Zone</th>
<th>Map Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>A</td>
<td>2</td>
<td>Assumed 6 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01</td>
<td>A</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Tanks, heating oil, nonresidential (aboveground)</td>
<td>T14</td>
<td>T14-1</td>
<td>A</td>
<td>2</td>
<td>Information provided by the water system operator; 4,000 gallon insulated double wall tank</td>
</tr>
<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
<td>U04</td>
<td>U04-3</td>
<td>A</td>
<td>2</td>
<td>From ADEC Contaminated Sites Data; Skagway Diesel Spill Well #2; RecKey 1997110100301</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>A</td>
<td>2</td>
<td>From USGS 1:24k mapping; six roads</td>
</tr>
<tr>
<td>Campgrounds and RV Parks</td>
<td>X35</td>
<td>X35-1</td>
<td>A</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
</tr>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>B</td>
<td>2</td>
<td>Assumed 9 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01-2</td>
<td>B</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
<td>U04</td>
<td>U04-1</td>
<td>B</td>
<td>2</td>
<td>From ADEC Contaminated Sites data; Skagway State Street Mystery; RecKey 1998110132201</td>
</tr>
<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
<td>U04</td>
<td>U04-2</td>
<td>B</td>
<td>2</td>
<td>From ADEC Contaminated Sites data; White Pass Coach Cleaning Shop; RecKey 2000110118901</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>B</td>
<td>2</td>
<td>From USGS 1:24k mapping; nine roads</td>
</tr>
<tr>
<td>Rail corridors</td>
<td>X30</td>
<td>X30-1</td>
<td>B</td>
<td>2</td>
<td>From USGS 1:24k mapping</td>
</tr>
<tr>
<td>Dog walking areas/foot trails</td>
<td>X46</td>
<td>X46-1</td>
<td>B</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
</tr>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>C</td>
<td>2</td>
<td>Assumed 6 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01-3</td>
<td>C</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>C</td>
<td>2</td>
<td>From USGS 24k mapping; six roads</td>
</tr>
<tr>
<td>Railroad yards</td>
<td>X31</td>
<td>X31-1</td>
<td>C</td>
<td>2</td>
<td>From USGS 1:24k mapping</td>
</tr>
</tbody>
</table>
### Table 2

**Contaminant Source Inventory and Risk Ranking for City of Skagway**

**Sources of Bacteria and Viruses**

<table>
<thead>
<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID tag</th>
<th>Zone</th>
<th>Risk Ranking for Analysis</th>
<th>Map Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>A</td>
<td>Medium</td>
<td>2</td>
<td>Assumed 6 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; six roads</td>
</tr>
<tr>
<td>Campgrounds and RV Parks</td>
<td>X35</td>
<td>X35-1</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
</tr>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>B</td>
<td>Medium</td>
<td>2</td>
<td>Assumed 9 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01-2</td>
<td>B</td>
<td>Low</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>B</td>
<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; nine roads</td>
</tr>
<tr>
<td>Dog walking areas/foot trails</td>
<td>X46</td>
<td>X46-1</td>
<td>B</td>
<td>Low</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
</tr>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
<td>D01</td>
<td>C</td>
<td>Medium</td>
<td>2</td>
<td>Assumed 6 sewer lines from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01-3</td>
<td>C</td>
<td>Low</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>C</td>
<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; six roads</td>
</tr>
<tr>
<td>Contaminant Source Type</td>
<td>Contaminant Source ID</td>
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<td>Residential Areas</td>
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<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
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<td>Low</td>
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</tr>
<tr>
<td>Campgrounds and RV Parks</td>
<td>X35</td>
<td>X35-1</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
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<td>X20</td>
<td>B</td>
<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; nine roads</td>
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<td>Dog walking areas/foot trails</td>
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<td>B</td>
<td>Low</td>
<td>2</td>
<td>From <a href="http://www.skagway.org">http://www.skagway.org</a> information</td>
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<tr>
<td>Residential Areas</td>
<td>R01</td>
<td>R01-3</td>
<td>C</td>
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<td>Highways and roads, paved (cement or asphalt)</td>
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<td>C</td>
<td>Low</td>
<td>2</td>
<td>From USGS 24k mapping; six roads</td>
</tr>
</tbody>
</table>
### Table 4

**Contaminant Source Inventory and Risk Ranking for City of Skagway**

**Sources of Volatile Organic Chemicals**

<table>
<thead>
<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID tag</th>
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<td>R01</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Tanks, heating oil, nonresidential (aboveground)</td>
<td>T14</td>
<td>T14-1</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>Information provided by the water system operator; 4,000 gallon insulated double wall tank</td>
</tr>
<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
<td>U04</td>
<td>U04-3</td>
<td>A</td>
<td>High</td>
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<td>From ADEC Contaminated Sites Data; Skagway Diesel Spill Well #2; RecKey 1997110100301</td>
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<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; six roads</td>
</tr>
<tr>
<td>Campgrounds and RV Parks</td>
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<td>A</td>
<td>Low</td>
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</tr>
<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
<td>U04</td>
<td>U04-1</td>
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<td>High</td>
<td>2</td>
<td>From ADEC Contaminated Sites data; Skagway State Street Mystery; RecKey 1998110132201</td>
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<tr>
<td>Contaminated sites, DEC recognized, non-Superfund, non-RCRA</td>
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<td>B</td>
<td>High</td>
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<td>Low</td>
<td>2</td>
<td>From USGS 1:24k mapping; nine roads</td>
</tr>
<tr>
<td>Rail corridors</td>
<td>X30</td>
<td>X30-1</td>
<td>B</td>
<td>Medium</td>
<td>2</td>
<td>From USGS 1:24k mapping</td>
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<tr>
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<td>R01-3</td>
<td>C</td>
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<td>Highways and roads, paved (cement or asphalt)</td>
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<td>2</td>
<td>From USGS 24k mapping; six roads</td>
</tr>
<tr>
<td>Railroad yards</td>
<td>X31</td>
<td>X31-1</td>
<td>C</td>
<td>High</td>
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<td>From USGS 1:24k mapping</td>
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Page 3
### Table 5

**Contaminant Source Inventory and Risk Ranking for City of Skagway**

**Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals**

<table>
<thead>
<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID tag</th>
<th>Zone</th>
<th>Risk Ranking for Analysis</th>
<th>Map Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
<td>D01</td>
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<td>Low</td>
<td>2</td>
<td>Assumed from USGS 1:24k mapping</td>
</tr>
<tr>
<td>Tanks, testing oil, nonresidential (aboveground)</td>
<td>T14</td>
<td>T14-1</td>
<td>A</td>
<td>Low</td>
<td>2</td>
<td>Information provided by the water system operator; 4,000 gallon insulated double wall tank</td>
</tr>
<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
<td>X20</td>
<td>A</td>
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<tr>
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<td>C</td>
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<td>2</td>
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### Contaminant Source Inventory and Risk Ranking for City of Skagway

**Sources of Synthetic Organic Chemicals**

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<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID tag</th>
<th>Zone</th>
<th>Risk Ranking for Analysis</th>
<th>Map Number</th>
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<tbody>
<tr>
<td>Domestic wastewater collection systems (sewer lines or lift stations)</td>
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<td>2</td>
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</tr>
<tr>
<td>Rail corridors</td>
<td>X30</td>
<td>X30-1</td>
<td>B</td>
<td>Medium</td>
<td>2</td>
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<tr>
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<td>R01-3</td>
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<tr>
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### Contaminant Source Inventory and Risk Ranking for City of Stagway

#### Sources of Other Organic Chemicals

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<tr>
<th>Contaminant Source Type</th>
<th>Contaminant Source ID</th>
<th>CS ID Tag</th>
<th>Zone</th>
<th>Risk Ranking for Analysis</th>
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<tr>
<td>Highways and roads, paved (cement or asphalt)</td>
<td>X20</td>
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<td>X31-1</td>
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</tbody>
</table>
APPENDIX C

Skagway Water System
Potential Contaminant Sources
(Map 2)
Map 2: Potential and Existing Contaminant Sources

PWSID: 110601

Data Sources:
Background image - USGS 1:63,000 mapping
Lakes, streams, & roads - U.S. Forest Service

Protection Zones for the City of Skagway were delineated based upon watershed area and groundwater flow information.

Legend
- City of Skagway - Well
- Zone A Protection Area
- Zone B Protection Area
- Residential Areas
APPENDIX D

Vulnerability Analysis for Skagway Water System
Public Drinking Water Source
(Charts 1-14)
Chart 1. Susceptibility of the wellhead - City of Skagway

- Susceptibility initially assumed to be low.
- Susceptibility of wellhead - 0 pts

- Information based on 6/17/02 Sanitary

- Is the well capped?
  - NO: Increase susceptibility 20 pts
  - YES: All three wells are capped with a sanitary

- Is the well within a floodplain?
  - NO: Increase susceptibility; 10 pts: suspected floodplain, 20 pts: known floodplain
  - YES: All three wells are within the floodplain

- Is the land surface sloped away from the well?
  - NO: Increase susceptibility 5 pts
  - YES: Very High

- None of the three wells are grouted

- Is the well properly grouted?
  - NO: Increase susceptibility 5 pts
  - YES: Susceptibility of wellhead 25 pts

- Wellhead Susceptibility Ratings:
  - 20 to 25 pts: very high
  - 15 to < 20 pts: high
  - 10 to < 15 pts: medium
  - < 10 pts: low
Chart 2. Susceptibility of the aquifer - City of Skagway

Susceptibility initially assumed to be low.
Susceptibility of aquifer = 0 pts

Are there one or more boreholes or wells penetrating the vadose zone?

YES

Increase susceptibility 1 - 10 pts:
Zone A: 10 pts
Zone B: 5 pts
Zone C: 1 pt

Evaluates confinement of source aquifer

- 8 pts

NO

Evaluate protectiveness of the vadose zone

- 7 pts

Seventy-seven points

Protectiveness of the Vadose Zone (average score of net recharge, depth to water)
6 pts: 50% weight - Net recharge (average of precip, slope of land surface, & soil permeability)
5 pts: average annual precip is 26 inches/year
6 pts: gravel, sand, clay till
6 pts: glacial sand
8 pts: 50% weight - Depth to water table (unconfined aquifer) or top of confining layer (confined aquifer); linearly interpolated based on depth
8 pts: Depth to water table 10 ft

Susceptibility of aquifer

High

Aquifer Susceptibility Ratings
20 to 25 pts very high
15 to <20 pts high
10 to <15 pts medium
< 10 pts low

Semi-confinement with ~20 ft of clay till and
12 pts: cemented gravel
0 pts: no known wells in the protection area
Chart 3. Contaminant risks for City of Skagway - Bacteria & Viruses

Contaminant risks initially assumed to be low.
Contaminant risks = 0 pts

Total coliform was detected in well #1 on 7/30/03 (verified on
+ 50 pts

Has there been a positive result for bacteria and viruses in recent sampling period(s)?

YES
Increase susceptibility 50 pts

NO

What level of risk is associated with the highest and the next highest sources of contaminants identified in Zones A and B?

+ 20 pts

Risk Rankings for Contaminant Sources Identified in Zones A and B

<table>
<thead>
<tr>
<th>Zone A</th>
<th>Zone B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Low(s)</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Matrix Score 20

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "low" or "medium" based on the density.
Chart 3. Contaminant risks for City of Skagway - Bacteria & Viruses

- Initial assessment of risk posed by potential sources of contamination = 20 pts

  - Are any significant contaminant sources within Zone A?
    - NO → Risk unchanged
    - YES → Increase risk 1 - 10 pts

  - Are there any conditions that warrant upgrading risk?
    - NO → Risk unchanged
    - YES → Increase risk 1 - 10 pts

- Risk posed by potential sources of contamination = 20 pts

- Are there sufficient controls, conditions, or monitoring to warrant downgrading risk?
  - NO → Risk unchanged
  - YES → Reduce risk 1 - 10 pts = 0 pts

- Risk posed by potential sources of contamination with controls = 20 pts

- Risk due to existing contamination + Risk posed by potential sources of contamination with controls = Contaminant risks

- Contaminant risks* = 50 pts

* Truncate risk at 50 pts

Contaminant Risk Ratings
- 40 to 50 pts = very high
- 30 to < 40 pts = high
- 20 to < 30 pts = medium
- < 20 pts = low

Very High
Chart 4. Vulnerability analysis for City of Skagway - Bacteria & Viruses

(Chart 1. Susceptibility of the wellhead)

Evaluate the susceptibility of the wellhead

Susceptibility of wellhead 25 pts → Very High

(Chart 2. Susceptibility of the aquifer)

Evaluate the susceptibility of the aquifer within the protection area

Susceptibility of aquifer 15 pts

Susceptibility of the wellhead + Susceptibility of aquifer = Susceptibility of well

(Chart 3. Contaminant risks for wells - Bacteria & Viruses)

Evaluate contaminant risks

Contaminant risks 50 pts → Very High

Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination

Vulnerability of drinking water well 90 pts

Overall Vulnerability Ratings
- 80 to 100 pts: Very High
- 60 to < 80 pts: High
- 40 to < 60 pts: Medium
- < 40 pts: Low

Very High
Chart 5. Contaminant risks for City of Skagway - Nitrates and Nitrites

Contaminant risks initially assumed to be low.
Contaminant risks = 0 pts

Has nitrates and/or nitrites been detected in the source waters in recent sampling period(s)?

NO or UNKNOWN

YES

Recent Nitrates Sampling Results (mg/L)

<table>
<thead>
<tr>
<th>Date</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/30/2003</td>
<td>0.236</td>
</tr>
<tr>
<td>8/5/2002</td>
<td>0.226</td>
</tr>
<tr>
<td>11/27/2001</td>
<td>0.270</td>
</tr>
<tr>
<td>12/14/2000</td>
<td>0.370</td>
</tr>
<tr>
<td>7/28/1999</td>
<td>ND</td>
</tr>
</tbody>
</table>

Results are from well #1: results from well #2 and #3 are similar.

Maximum Contaminant Level (MCL) = 10 mg/L
Detected Nitrate Level = 2%

Existing contamination points based on linear interpolation of most recent detect
[MCL = 50 pts; detect = 0 pts]

Was the source of contamination natural?

NO

Evaluate the level of contamination from natural sources

YES

Evaluate the level of contamination from man-made source(s)

Current level of contamination due to man-made source(s) = 0 pts

Is the concentration of the contaminant increasing, decreasing, or staying the same?

Increasing: risk up 1 - 10 pts
Decreasing: risk down 1 - 5 pts
Same: risk unchanged

Risk due to natural sources = 1 pts

Risk due to existing man-made sources = 0 pts

Risk due to existing contamination = 1 pts
Chart 5. Contaminant risks for City of Skagway - Nitrates and Nitrates

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

<table>
<thead>
<tr>
<th>Risk Levels for Contaminant Sources identified in Zones A, B and C</th>
<th>Zone A</th>
<th>Zones B&amp;C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Low(s)</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
<th>VERY HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 pts</td>
<td>20 pts</td>
<td>30 pts</td>
<td>40 pts</td>
</tr>
</tbody>
</table>

Initial assessment of risk posed by potential sources of contamination = 20 pts

Is the source aquifer fractured rock or karst?

Are all of the higher risk sources beyond Zones A and B?

Are any significant sources within Zone A?

Matrix Score = 20 pts

Note: Septic systems, sewercines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "low" or "medium" based on the density.
Chart 5. Contaminant risks for City of Skagway - Nitrates and Nitrites

- Are there conditions that warrant upgrading risk? 
  - NO: Risk unchanged
  - YES: Increase risk 1 - 10 pts
    - Risk posed by potential sources of contamination 20 pts
      - Are there sufficient controls, conditions, or monitoring to warrant downgrading risk? 
        - NO: Risk unchanged
          + 0 pts
        - YES: Decrease risk 1 - 10 pts
          - Risk posed by potential sources of contamination with controls 20 pts

Risk due to existing contamination + Risk posed by potential sources of contamination with controls = Contaminant risks

Contaminant risks* = 21 pts

*Truncate risk at 50 pts

Medium

Existing 1 pts + Potential 20 pts = Contaminant Risk 21 pts

Contaminant Risk Ratings

- 40 to 50 pts: very high
- 30 to < 40 pts: high
- 20 to < 30 pts: medium
- < 20 pts: low
Chart 6. Vulnerability analysis for City of Skagway - Nitrates and Nitrites

(Chart 1. Susceptibility of the wellhead)

Evaluate the susceptibility of the wellhead

Susceptibility of wellhead
25 pts

Very High

(Chart 2. Susceptibility of the aquifer)

Evaluate the susceptibility of the aquifer within the protection area

Susceptibility of aquifer
15 pts

High

(Chart 5. Contaminant risks for wells - Nitrates and Nitrites)

Evaluate contaminant risks

Contaminant risks
21 pts

Medium

Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination

Vulnerability of drinking water well
61 pts

High

Overall Vulnerability Ratings

- 80 to 100 pts very high
- 60 to < 80 pts high
- 40 to < 60 pts medium
- < 40 pts low
Chart 7. Contaminant risks for City of Skagway - Volatile Organic Chemicals

- Contaminant risks initially assumed to be low.
  - Contaminant risks = 0 pts

- Have volatile organic chemicals been detected in the source waters in recent sampling period(s)?
  - NO
  - Evaluate the level of background contamination from natural sources
  - Recent Trichloroethylene Sampling Results (mg/L)
    - 12/30/2003: 0.00083
    - 12/16/2002: 0.00078
    - 12/18/2001: ND
    - 11/27/2000: 0.0009
    - 7/28/1999: ND
    - Sample results are from Well #1; results from Well #2 are similar; Trichloroethylene was not detected in Well #2
  - Maximum Contaminant Level (MCL) = 0.005 mg/L
  - Detected Level = 17%

- Existing contamination points based on linear interpolation of most recent detect
  - MCL = 50 pts; detect = 0 pts

- Was the source of contamination natural?
  - NO
  - Evaluate the level of contamination from man-made sources

- Risk due to natural sources = 0 pts
- Risk due to existing man-made sources = 8 pts

- Risk due to existing contamination = 8 pts
- Current level of contamination due to man-made source(s) = 8 pts

- Is the concentration of the contaminant increasing, decreasing, or staying the same?
  - Increasing: risk up 1 - 10 pts
  - Decreasing: risk down 1 - 5 pts
  - Staying the same: risk unchanged
  - - 0 pts
Chart 7. Contaminant risks for City of Skagway - Volatile Organic Chemicals

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

+ 40 pts

---

Risk Levels for Contaminant Sources identified in Zones A, B and C

<table>
<thead>
<tr>
<th>Zone A</th>
<th>Zones B&amp;C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Low(s)</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

---

Matrix Score - 40

---

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either " lows" or "mediums" based on the density.
Chart 8. Vulnerability analysis for City of Skagway - Volatile Organic Chemicals

(Chart 1. Susceptibility of the wellhead)

Evaluate the susceptibility of the wellhead

Susceptibility of wellhead 25 pts

Very High

(Chart 2. Susceptibility of the aquifer)

Evaluate the susceptibility of the aquifer within the protection area

Susceptibility of aquifer 15 pts

High

(Chart 7. Contaminant risks for wells - Volatile Organic Chemicals)

Evaluate contaminant risks

Contaminant risks 38 pts

High

Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination

Overall Vulnerability Ratings

- 80 to 100 pts very high
- 60 to < 80 pts high
- 40 to < 60 pts medium
- < 40 pts low

Vulnerability of drinking water well 78 pts

75

High
Chart 9. Contaminant risks for City of Skagway - Heavy Metals, Cyanide and Other Inorganic Chemicals

Contaminant risks initially assumed to be low.
Contaminant risks = 0 pts

Have heavy metals, cyanide or other inorganic chemicals been detected in the source waters in recent sampling period(s)?

YES

Recent Metals Sampling Results (mg/L)
1/27/2001 ND
Arsenic, Barium, Chromium, Fluoride, and Nickel were detected but in concentrations well below their respective MCLs.

Existing contamination points based on linear interpolation of most recent detect (MCL = 50 pts; detect = 0 pts)

NO

Evaluate the level of background contamination from natural sources

Is the concentration of the contaminant increasing, decreasing, or staying the same?

Increasing: risk up 1 - 10 pts
Decreasing: risk down 1 - 5 pts
Same: risk unchanged

Risk due to natural sources 0 pts

Risk due to existing man-made sources 0 pts

Risk due to existing contamination 0 pts
Chart 9. Contaminant risks for City of Skagway - Heavy Metals, Cyanide and Other Inorganic Chemicals

What level of risk is associated with the highest and the next highest risk sources of contaminants identified in Zones A, B and C?

+ 10 pts

<table>
<thead>
<tr>
<th>Risk Levels for Contaminant Sources identified in Zones A, B and C</th>
<th>Zone A</th>
<th>Zones B&amp;C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Low(s)</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

Matrix Score = 10

Note: Septic systems, sewers, and roads each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "low" or "medium" based on the density.

Initial assessment of risk posed by potential sources of contamination = 10 pts

Is the source aquifer fractured rock or karst?

YES

NO

Are all of the higher risk sources beyond Zones A and B?

YES

- 0 pts

NO

Risk unchanged

Are any significant sources within Zone A?

YES

Increase risk 1 - 10 pts

NO

Risk unchanged

+ 0 pts
Chart 9. Contaminant risks for City of Skagway - Heavy Metals, Cyanide and Other Inorganic Chemicals

1. Are there conditions that warrant upgrading risk?
   - YES: Increase risk 1-10 pts
   - NO: Risk unchanged

2. Risk posed by potential sources of contamination 10 pts

3. Are there sufficient controls, conditions, or monitoring to warrant downgrading risk?
   - YES: Decrease risk 1-10 pts
   - NO: Risk unchanged

4. Risk posed by potential sources of contamination with controls 10 pts

5. Risk due to existing contamination
   + Risk posed by potential sources of contamination with controls = Contaminant risks

6. Existing 0 pts
   + Potential 10 pts = Contaminant Risk 10 pts

Contaminant risks* = 10 pts

*Truncate risk at 50 pts

Low Contaminant Risk Ratings
- 40 to 50 pts: very high
- 30 to < 40 pts: high
- 20 to < 30 pts: medium
- < 20 pts: low
Chart 10. Vulnerability analysis for City of Skagway - Heavy Metals, Cyanide and Other Inorganic Chemicals

(Chart 1. Susceptibility of the wellhead)
Evaluate the susceptibility of the wellhead

Susceptibility of wellhead
25 pts

(Chart 2. Susceptibility of the aquifer)
Evaluate the susceptibility of the aquifer within the protection area

Susceptibility of aquifer
15 pts

(Chart 9. Contaminant risks for wells - Heavy Metals, Cyanide and Other Inorganic Chemicals)
Evaluate contaminant risks

Contaminant risks
10 pts

Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination

Vulnerability of drinking water well
50 pts

Overall Vulnerability Ratings
80 to 100 pts = very high
60 to < 80 pts = high
40 to < 60 pts = medium
< 40 pts = low

Medium

Very High

Low

Medium
Chart 11. Contaminant risks for City of Skagway - Synthetic Organic Chemicals

Contaminant risks initially assumed to be low.
Contaminant risks = 0 pts

Have synthetic organic chemicals been detected in the source waters in recent sampling period(s)?

YES

Recent SOC Sampling Results (mg/L)
1/25/1993 ND

Evaluate the level of contamination from natural sources

NO

Existing contamination points based on linear interpolation of most recent detect
MCL = 50 pts; detect = 0 pts

Was the source of contamination natural?

YES

Evaluate the level of contamination from man-made sources

NO

Current level of contamination due to man-made source(s)
0 pts

Is the concentration of the contaminant increasing, decreasing, or staying the same?

Increasing: risk up 1 - 10 pts
Decreasing: risk down 1 - 5 pts
Same: risk unchanged

Risk due to natural sources
0 pts

Risk due to existing man-made sources
0 pts

Risk due to existing contamination
0 pts
Chart 11. Contaminant risks for City of Skagway - Synthetic Organic Chemicals

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

+ 20 pts

Risk Levels for Contaminant Sources identified in Zones A, B and C

<table>
<thead>
<tr>
<th>Level</th>
<th>Zone A</th>
<th>Zones B&amp;C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Low(s)</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Initial assessment of risk posed by potential sources of contamination = 20 pts

Is the source aquifer fractured rock or karst?

NO

Are all of the higher risk sources beyond Zones A and B?

NO

Risk unchanged

- 0 pts

Matrix Score = 20

Note: Septic systems, seeptraps, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

YES

Decrease risk 1 - 10 pts

Are any significant sources within Zone A?

NO

Risk unchanged

+ 0 pts

YES

Increase risk 1 - 10 pts
Chart 11. Contaminant risks for City of Skagway - Synthetic Organic Chemicals

- **Risk due to existing contamination**
  - Risk posed by potential sources of contamination with controls
  - Contaminant risks

- **Medium**
  - Contaminant Risk Ratings:
    - 40 to 50 pts: very high
    - 30 to < 40 pts: high
    - 20 to < 30 pts: medium
    - < 20 pts: low
Chart 12. Vulnerability analysis for City of Skagway - Synthetic Organic Chemicals

(Chart 1. Susceptibility of the wellhead)

Evaluate the susceptibility of the wellhead

Susceptibility of wellhead
25 pts

Very High

(Chart 2. Susceptibility of the aquifer)

Evaluate the susceptibility of the aquifer within the protection area

Susceptibility of aquifer
15 pts

High

Susceptibility of the wellhead + Susceptibility of aquifer = Susceptibility of well

Susceptibility of the well

Contaminant risks
20 pts

Medium

(Chart 11. Contaminant risks for wells - Synthetic Organic Chemicals)

Evaluate contaminant risks

Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination

Vulnerability of drinking water well
60 pts

High

Overall Vulnerability Ratings
- 80 to 100 pts very high
- 60 to < 80 pts high
- 40 to < 60 pts medium
- < 40 pts low

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Chart 13. Contaminant risks for City of Skagway - Other Organic Chemicals

Contaminant risks initially assumed to be low.
Contaminant risks = 0 pts

Have other organic chemicals been detected in the source waters in recent sampling period(s)?

- NO

Existing contamination points based on linear interpolation of most recent detect
[MCL = 30 pts; detect = 0 pts]

Was the source of contamination natural?

- NO

Evaluate the level of contamination from natural sources

- YES

Evaluate the level of contamination from man-made source(s)

Current level of contamination due to man-made source(s) = 0 pts

Is the concentration of the contaminant increasing, decreasing, or staying the same?

- Increasing: risk up 1 - 10 pts
- Decreasing: risk down 1 - 5 pts
- Same: risk unchanged

Risk due to existing contamination = 0 pts

Risk due to natural sources = 0 pts

Risk due to existing man-made sources = 0 pts

+ 0 pts
Chart 13. Contaminant risks for City of Skagway - Other Organic Chemicals

What level of risk is associated with the highest and the next highest risk sources of contaminants identified in Zones A, B and C?

Risk Levels for Contaminant Sources identified in Zones A, B and C

<table>
<thead>
<tr>
<th>Level</th>
<th>Zone A</th>
<th>Zones B&amp;C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High(s)</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Medium(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Low(s)</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Matrix Score: 30

Note: Septic systems, sewer lines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either “low” or “medium” based on the density.
Chart 13. Contaminant risks for City of Skagway - Other Organic Chemicals

1. Are there conditions that warrant upgrading risk?
   - NO: Risk unchanged
   - YES: Increase risk 1 - 10 pts

2. Risk posed by potential sources of contamination
   - 30 pts

3. Are there sufficient controls, conditions, or monitoring to warrant downgrading risk?
   - NO: Risk unchanged
   - YES: Decrease risk 1 - 10 pts

4. Risk posed by potential sources of contamination with controls
   - 30 pts

Risk due to existing contamination + Risk posed by potential sources of contamination with controls = Contaminant risks

Contaminant risks* = 30 pts

*Truncate risk at 30 pts

High

Contaminant Risk Ratings
40 to 50 pts very high
30 to < 40 pts high
20 to < 30 pts medium
< 20 pts low
Chart 14. Vulnerability analysis for City of Skagway - Other Organic Chemicals

- Evaluate the susceptibility of the wellhead
  - Susceptibility of wellhead 25 pts
    - Evaluate the susceptibility of the aquifer within the protection area
      - Susceptibility of aquifer 15 pts
        - Susceptibility of the wellhead + Susceptibility of aquifer = Susceptibility of well
          - Overall Vulnerability Rating:
            - 80 to 100 pts = very high
            - 60 to < 80 pts = high
            - 40 to < 60 pts = medium
            - < 40 pts = low

- Evaluate contaminant risks
  - Contaminant risks 30 pts
    - Susceptibility of the well + Contaminant risks = Vulnerability of drinking water well to contamination
      - Vulnerability of drinking water well 70 pts
        - Overall Vulnerability Rating: High
APPENDIX B

ANNUAL DRINKING WATER QUALITY REPORT
This report is provided to inform you about the quality of your drinking water, and how it compares to national drinking water standards.

Please take a moment to review this important information.

Common Drinking Water Impurities

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the land or underground, it can pick up substances or impurities such as microbes, inorganic and organic chemicals, dissolved minerals and radioactive substances. Impurities can result from natural causes or human and animal activity, and can be located some distance from the affected water supply. Impurities that may be present in drinking water include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from wildlife, livestock, or septic systems.
- **Organic Chemicals**, including synthetic and volatile organic chemicals which can originate in petroleum products, industrial byproducts, urban runoff and septic systems.
- **Radioactive contaminants** which can be naturally occurring or can result from mining, oil and gas production.
- **Pesticides and herbicides**, which can come from agricultural activity, residential usage, and urban runoff.
- **Inorganic impurities**, such as salts and metals, which can come from natural sources, mining, farming, wastewater discharges, oil and gas production and urban runoff.

All drinking water, including the best bottled water, may be reasonably expected to contain at least small amounts of some impurities. However, the presence of these impurities does not necessarily indicate the water is a health risk. More information about impurities and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline (800-426-4791).

Water Quality Testing

Because of the numerous potential sources and varieties of impurities, state and federal law mandates the routine testing for all impurities (over 80) known to pose a risk to public health. Some impurities can affect water sources quickly and others are not expected to vary significantly from year to year. Thus, testing schedules also vary from monthly to once every nine years, depending on risk and the impurity tested. Your water system is routinely monitored for all applicable hazardous impurities. However, of those impurities, only those detected in routine testing are listed in the Table of Detected Impurities of this report.

Lead: A Contaminant You Can Control

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Your water service provider is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When a tap has been unused for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 sec. to 2 min. before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at www.epa.gov/safewater/lead.
Lead and Copper

The Lead and Copper rule requires water to be tested for its ability to cause lead and copper to leach from your home's plumbing. To be in compliance with the Lead and Copper Rule, 90% of the results must be less than or equal to the action level. The testing sites were chosen as the most likely to show impurities based on the age of their plumbing.

Filters

Although your water is rigorously tested to assure it's safety, it may have aesthetic qualities you find objectionable such as iron, manganese, calcium, or sulfur smell. If you choose to filter, here are some tips to consider.

Filter Maintenance

Many homes have cartridge style water filters installed either under the kitchen sink or large whole house filters installed where the water enters the house. These filters can be a source of harmful bacteria if they are not regularly maintained. As a general rule, filter cartridges should be replaced every 6 months although individual manufacturers specifications may vary. Symptoms of a plugged filter may be dirty water, unpleasant odor, or low pressure.

Filter Selection

Improper media selection can cause poor results.

- For mineral removal such as iron, calcium and manganese, water softening, RO, or green sand filtration is recommended.
- For taste and odor associated with chlorine and sulfur (rotten eggs), use carbon cartridge media.
- For fine particle removal, 5-10 micron cartridge media is best.
- Because of high maintenance costs, 1 micron cartridges are only recommended when contamination from surface runoff is suspected. Skagway's aquifer is adequately protected from surface contamination and 1 micron filters are not advised.

CAUTION: If a filter, including softeners, is not in use, it should be bypassed to prevent bacterial growth from contaminating your drinking water.

Vulnerable Populations

Some people may be more vulnerable to impurities in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Waivers

To eliminate unnecessary testing expense, Skagway Water Utility has applied for and received testing waivers for asbestos (no asbestos piping in system) and pesticides and other organic chemicals (no applicable potential source is found in the collection area). These waivers must be reviewed and renewed periodically at which time any change in impurity sources or new science is applied in the approval process.

Coliform Bacteria

Of all potential impurities, drinking water is most vulnerable to bacteria. The presence of coliform bacteria has been proven to be a reliable indicator of bacterial and viral contamination, and as a result, your water is tested for coliform bacteria twice a month. In July of 2013, a routine sample indicated positive for coliform bacteria, however immediate re-sampling showed no sign of coliform bacteria. The utility and ADEC concluded sampling or lab error caused the problem.

Run Before You Drink!

Drinking water impurities may become concentrated in your home's plumbing during prolonged periods of inactivity. It is always a good idea to allow a faucet to run until cold before taking a drink.

System Protection

Although Skagway Water Utility personnel strive to adequately protect your water source and distribution system, you, the customer, also play a vital role in system protection:

- Properly dispose of hazardous waste.
- Support environmentally sound programs in our community and state.
- Report suspicious activity around your drinking water system installations.

Lead and Copper

The Lead and Copper rule requires water to be tested for its ability to cause lead and copper to leach from your home's plumbing. To be in compliance with the Lead and Copper Rule, 90% of the results must be less than or equal to the action level. The testing sites were chosen as the most likely to show impurities based on the age of their plumbing.

Excellent Water Quality!

Monitoring results show Skagway's water quality far exceeds State and Federal requirements including FDA requirements for bottled water!
ALS Water Investigation

In October and December, 2012, as part of the MOS Amyotrophic Lateral Sclerosis (ALS) investigation, the potable water supply of the municipality was sampled and tested for metals, volatile and semi-volatile organic contaminants, relevant neurotoxins (e.g. microcystin), associated compounds (e.g. BMAA) and a broad suite of other contaminants of specific relevance to ALS and other motor neuron diseases. The full list of constituents tested in MOS drinking water included and exceeded all of those normally recommended and/or prescribed by the USEPA and State of Alaska at detection levels meeting or exceeding normal protocols. The results of this sampling program indicated that MOS well water supplies were found to be free of any contaminants of concern for ALS and met or exceeded all other drinking water standards.

System Maintenance

Skagway Water Utility water source and distribution system is routinely maintained and tested by the Skagway Department of Public Works.

Did You Know?

Each Year, Skagway’s Water Utility spends thousands of dollars on water testing to ensure your water is safe to drink. Only the impurities that are detected are reported in this report but hundreds of other potential contaminates are routinely tested for and remain undetected. Skagway’s Water Utility is committed to providing pure, chlorine and fluoride free water to all its service area.

Questions or Emergencies?

If you have any questions, need to report an emergency or are simply interested in learning more about Skagway’s drinking water system, the department management is pleased to assist you. Office hours are 7:00-4:00 Mon-Fri. Tel: (907)-983-2071 24 Hour Emergency response is available at (907)-612-0046 or (907)-612-0051.

Definitions and Terms

MCLG (Maximum Contaminant Level Goal) The level of contamination below which there is no known or expected health risk.
MCL (Maximum Contaminant Level) The highest level of contamination allowable in drinking water.
AL (Action Level) The concentration of a contaminant which, when exceeded, triggers treatment or other requirements that a water system must follow.
ppb (Parts Per Billion) This measure corresponds to one penny in $10,000,000 or one minute in 2000 years.
pCi/L (Picocuries Per Liter) A measure of radioactivity.

TABLE OF DETECTED IMPURITIES

<table>
<thead>
<tr>
<th>Impurity</th>
<th>Sample Date</th>
<th>Level Detected</th>
<th>MCL</th>
<th>MCLG</th>
<th>Likely Source</th>
<th>Violation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Coliform</td>
<td>7-24-2013</td>
<td>Positive</td>
<td>1 per year</td>
<td>0</td>
<td>Naturally Present in the environment</td>
<td>N</td>
</tr>
<tr>
<td>Lead</td>
<td>2012</td>
<td>15 ppb</td>
<td>AL=15 ppb</td>
<td>0</td>
<td>Corrosion of household plumbing, erosion of natural deposits.</td>
<td>N</td>
</tr>
<tr>
<td>Copper</td>
<td>2012</td>
<td>890 ppb</td>
<td>AL=1300 ppb</td>
<td>1300 ppb</td>
<td>Corrosion of household plumbing, erosion of natural deposits.</td>
<td>N</td>
</tr>
<tr>
<td>Nitrate</td>
<td>2013</td>
<td>0.25-4.41 ppb</td>
<td>10 ppb</td>
<td>10 ppb</td>
<td>Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits.</td>
<td>N</td>
</tr>
<tr>
<td>Barium</td>
<td>2011</td>
<td>52-77 ppb</td>
<td>2000 ppb</td>
<td>2000 ppb</td>
<td>Naturally present in the environment.</td>
<td>N</td>
</tr>
<tr>
<td>Gross Beta</td>
<td>2010</td>
<td>4.5 pCi/L</td>
<td>4 pCi/L</td>
<td>0</td>
<td>Erosion of natural deposits.</td>
<td>N</td>
</tr>
<tr>
<td>Combined Uranium</td>
<td>2010</td>
<td>0.7 pCi/L</td>
<td>30 pCi/L</td>
<td>0</td>
<td>Erosion of natural deposits.</td>
<td>N</td>
</tr>
<tr>
<td>Combined Radium</td>
<td>2010</td>
<td>0.87 pCi/L</td>
<td>5 pCi/L</td>
<td>0</td>
<td>Erosion of natural deposits.</td>
<td>N</td>
</tr>
</tbody>
</table>
APPENDIX C

CONTAMINATED SITES DATABASE FOR SKAGWAY, AK AREA
# Contaminated Sites Program

State of Alaska > DEC > SPAR > CSP > Database Search > Results

## CSP Database Search Results

**Records Found: 24**

<table>
<thead>
<tr>
<th>Hazard ID</th>
<th>Site Name</th>
<th>Location</th>
<th>Status</th>
<th>File ID</th>
<th>Closure Details</th>
<th>Open Sites with Institutional Controls</th>
<th>Cleanup Chronology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 400</td>
<td>White Pass &amp; Yukon Railroad Yard</td>
<td>NE of 23rd Avenue Bridge, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 401</td>
<td>Skagway (Nahku) Ore Terminal</td>
<td>State Street South at Skagway Harbor, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 2374</td>
<td>Petro Marine Skagway Truck Rack</td>
<td>10 Beach Road near, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 2376</td>
<td>Princess Tours Skagway</td>
<td>14th and State Streets, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.013</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 2539</td>
<td>PAPI Pipeline</td>
<td>Skagway and North to B.C., Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.003</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 2540</td>
<td>White Pass 6-Mile Spill</td>
<td>6 Miles North of Skagway, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.010</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 2541</td>
<td>Skagway Tank Farm</td>
<td>1 Mile Klondike Highway, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.011</td>
<td>Complete - Institutional Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 2542</td>
<td>White Pass 14-Mile Dump</td>
<td>White Pass Railroad, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.006</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 2544</td>
<td>White Pass 9-Mile Dump Site</td>
<td>Mi. 9 White Pass Railroad, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.012</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 2690</td>
<td>Skagway Diesel Spill Well #2</td>
<td>15th &amp; Alaska Streets, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.008</td>
<td>Complete</td>
<td></td>
<td></td>
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<tr>
<td>11 2694</td>
<td>Skagway Wharf Tanks Area</td>
<td>Skagway Boat Harbor, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.009</td>
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<td></td>
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<tr>
<td>12 2983</td>
<td>Skagway State Street Mystery</td>
<td>20th and State Streets, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.007</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>13 3268</td>
<td>White Pass Coach Cleaning Shop</td>
<td>21st and State Streets, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.002</td>
<td>Complete</td>
<td></td>
<td></td>
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<tr>
<td>14 4450</td>
<td>Alaska Liquor Store HOT</td>
<td>290 2nd Avenue, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.38.014</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 23080</td>
<td>Skagway Public Works Shop</td>
<td>Public Works Shop; Block 10, lot 8, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.26.007</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 23750</td>
<td>Skagway ADOT&amp;PF Maintenance Station</td>
<td>2 Mile Klondike Highway, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.26.006</td>
<td>Complete</td>
<td></td>
<td></td>
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<tr>
<td>17 24418</td>
<td>Skagway AT&amp;T</td>
<td>2nd and Main St., Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.26.002</td>
<td>Complete</td>
<td></td>
<td></td>
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<tr>
<td>18 24478</td>
<td>Skagway Westours Bus Facility</td>
<td>East 9th or 10th between Spring Street and Broadway, Skagway, AK 99840</td>
<td>Cleanup</td>
<td>1526.26.001</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Code</td>
<td>Site Name</td>
<td>Address Details</td>
<td>Status</td>
<td>Phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>24514</td>
<td>Chevron - Hoovers</td>
<td>Streets, Skagway, AK 99840</td>
<td>Complete</td>
<td>1526.26.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>24944</td>
<td>Skagway Public Works Maintenance Shop</td>
<td>5th and Alaska Street - Lots 7 - 10 of Block 10, Skagway, AK 99840</td>
<td>Cleanup Complete</td>
<td>1526.26.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>25086</td>
<td>Services Unlimited</td>
<td>State &amp; Second Streets, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.26.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>25184</td>
<td>Residence - 475B 7th Avenue</td>
<td>475B 7th Avenue, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.015</td>
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<td></td>
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<tr>
<td>23</td>
<td>25643</td>
<td>NPS Klondike Gold Rush Natl Park - Meyer Building</td>
<td>SW Corner of 5th Avenue and State Street, Skagway, AK 99840</td>
<td>Cleanup Complete</td>
<td>1526.38.016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>26058</td>
<td>ADOT&amp;PF Skagway Maintenance Station</td>
<td>2.5 Mile Klondike Highway, Skagway, AK 99840</td>
<td>Open</td>
<td>1526.38.017</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For questions about contaminated sites information, please contact: [Ewonne Reese](mailto:ewonne.reese@alaska.gov), Environmental Program Specialist, (907) 465-5229.

For CSP database technical support or assistance, please contact: [Jeremy Frank](mailto:jeremy.frank@alaska.gov), Analyst Programmer, (907) 465-5267.
APPENDIX D

ADEC, OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION FORM
# Alaska Department of Environmental Conservation
## Oil & Hazardous Substances Spill Notification

<table>
<thead>
<tr>
<th>ADEC Spill #</th>
<th>ADEC File #</th>
<th>ADEC LC</th>
</tr>
</thead>
</table>

### Person Reporting
- Phone Number
- Reported How? [ ] Troopers [ ] Phone [ ] Fax

### Date/Time of Spill
- Date/Time Discovered
- Date/Time Reported

### Location/Address
- Lat.
- Long.

### Substance Type
- A) CR, EHS, HS, NC, PW, UNK
- B) CR, EHS, HS, NC, PW, UNK

### Potential Responsible Party
- C-Plan Holder? [ ] Yes [ ] No

### Facility Type
- [ ] >400 GT Vessel

### Source of Spill
- [ ] Accident
- [ ] Human Factors
- [ ] Structural/Mechanical
- [ ] Other

### Cleanup Actions

### Disposal Methods and Location

### Resources Affected/Threatened
- Water sources, wildlife, wells, etc.

### Comments

---

### DEC Use Only

<table>
<thead>
<tr>
<th>Spill Name, If Any</th>
<th>Names of DEC Staff Responding</th>
<th>C-Plan Mgr Notified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[ ] No [ ] Yes</td>
</tr>
</tbody>
</table>

### Dec Response
- Phone follow-up [ ] Field Visit [ ] Took Report [ ]
- Case Load Code
  - First and Final [ ] Open/No LC [ ] LC Assigned [ ]
- Cleanup Closure Action
  - [ ] NFA [ ] Monitoring [ ] Transferred to CS or STR

### Status of Case (Circle)
- Open [ ] Closed [ ]

### Date Case Closed

### Comments:

### Report Prepared By

### Date

Revised June 19, 2006
ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION

<table>
<thead>
<tr>
<th>ADEC SPILL #</th>
<th>ADEC FILE #</th>
<th>ADEC LC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERSON REPORTING</th>
<th>PHONE NUMBER</th>
<th>REPORTED HOW?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob Cleveland</td>
<td>235-7556</td>
<td>phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE/TIME OF SPILL</th>
<th>DATE/TIME DISCOVERED</th>
<th>DATE/TIME REPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/15/05 0830</td>
<td>4/15/05 0900</td>
<td>4/15/05 1015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCATION/ADDRESS</th>
<th>LAT.</th>
<th>SUBSTANCE TYPE</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perl Rock, south side of Perl Island</td>
<td>59 06'N</td>
<td>A) CR EHS HS NC PW UNK</td>
<td>A) North Slope Crude Oil</td>
</tr>
<tr>
<td>Kennedy Entrance Cook Inlet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LONG.</td>
<td>151 41'W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUANTITY SPILLED</th>
<th>QUANTITY CONTAINED</th>
<th>QUANTITY RECOVERED</th>
<th>QUANTITY DISPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>380,000 bbis</td>
<td>0 gallons</td>
<td>0 gallons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 pounds</td>
<td>0 pounds</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POTENTIAL RESPONSIBLE PARTY</th>
<th>FACILITY TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Plan Holder? YES ☐ NO ☐</td>
<td>TAPS trade vessel</td>
</tr>
</tbody>
</table>

SOURCE OF SPILL:
T/V Cook Inlet

CAUSE OF SPILL (List Primary Cause first):
Power loss caused vessel to drift into Perl Rock and break apart on the rocks

CLEANUP ACTIONS
None

DISPOSAL METHODS AND LOCATION
n/a

RESOURCES AFFECTED/THREATENED
- Wildlife, commercial and sport fishing, subsistence

COMMENTS:
Response actions already taken are: Command Post and ICS establishment; overflight; assessment of quantity spilled

DEC USE ONLY

<table>
<thead>
<tr>
<th>SPILL NAME, IF ANY</th>
<th>NAMES OF DEC STAFF RESPONDING</th>
<th>C-PLAN MGR NOTIFIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>T/V Cook Inlet</td>
<td></td>
<td>YES ☐ NO ☐</td>
</tr>
</tbody>
</table>

DEC RESPONSE
☐ phone follow-up ☐ field visit ☐ took report | CASELOAD CODE | CLEANUP CLOSURE ACTION |
☐ ☐ ☐ | ☐ First and Final ☐ Open/No LC ☐ LC assigned | ☐ NFA ☐ Monitoring ☐ Transferred to CS or STP |

STATUS OF CASE (circle) OPEN CLOSED DATE CASE CLOSED

COMMENTS:

REPORT PREPARED BY DATE

revised June 19, 2004
Additional Instructions Page:
ADEC Spill Notification

By clicking on the i, you’ve reached this instructional page. Here you can find special instructions on individual text fields.

Page 1:

ADEC Spill #: This number will be assigned by ADEC for internal reference.
ADEC File #: This number will be assigned by ADEC for internal reference.
ADEC LC—This number will be assigned by ADEC for internal reference.
SURF. TYPE—This is the oil receiving medium
More Information on this Form

When do you need this form?
After an oil spill has been identified.

Who fills out this form?
A representative with the responsible party.

Who signs this form?
No signature is required.

Where does this form get delivered?
To the ADEC office at: 555 Cordova St. Anchorage, AK 99501.
Discharge Notification and Reporting Requirements

AS 46.03.755 and 18 AAC 75 Article 3

Notification of a discharge must be made to the nearest Area Response Team during working hours:

Anchorage  (907) 269-3063       Fairbanks  (907) 451-2121       Juneau  (907) 465-5340
  (907) 269-7648 (FAX)          (907) 451-2362 (FAX)         (907) 465-2237 (FAX)

OR

to the 24-Hour Emergency Reporting Number during non-working hours:
1-800-478-9300 (International 1-907-428-7200)

Notification Requirements

Hazardous Substance Discharges
Any release of a hazardous substance must be reported as soon as the person has knowledge of the discharge.

Oil Discharges

■ TO WATER
  • Any release of oil to water must be reported as soon as the person has knowledge of the discharge.

■ TO LAND
  • Any release of oil in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge.
  • Any release of oil in excess of 10 gallons, but 55 gallons or less, must be reported within 48 hours after the person has knowledge of the discharge.
  • A person in charge of a facility or operation shall maintain, and provide to the Department on a monthly basis, a written record of any discharge of oil from 1 to 10 gallons.

■ TO IMPERMEABLE SECONDARY CONTAINMENT AREAS
  • Any release of oil in excess of 55 gallons must be reported within 48 hours after the person has knowledge of the discharge.

Special Requirements for Regulated Underground Storage Tank (UST) Facilities*

If your release detection system indicates a possible discharge, or if you notice unusual operating conditions that might indicate a release, you must notify the Storage Tank Program at the nearest DEC Office within 7 days:

Anchorage  (907) 269-7886
  (907) 269-7679

*Regulated UST facilities are defined at 18 AAC 78.005 and do not include heating oil tanks.

rev. June/2010
REPORT ALL

OIL AND HAZARDOUS SUBSTANCE SPILLS

ALASKA LAW REQUIRES REPORTING OF ALL SPILLS

During normal business hours
contact the nearest DEC Area Response Team office:

<table>
<thead>
<tr>
<th>Region</th>
<th>Location</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Alaska</td>
<td>Anchorage</td>
<td>(907) 269-3063</td>
<td>(907) 269-7648</td>
</tr>
<tr>
<td></td>
<td>Fairbanks</td>
<td>(907) 451-2121</td>
<td>(907) 451-2362</td>
</tr>
<tr>
<td></td>
<td>Juneau</td>
<td>(907) 465-5340</td>
<td>(907) 465-2237</td>
</tr>
</tbody>
</table>

Outside normal business hours, call:
1-800-478-9300 (International 1-907-428-7200)

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response

rev. June/2010
APPENDIX F

DNR WATER RIGHTS IN ALASKA FACT SHEET
APPLICATION FOR WATER RIGHT

INSTRUCTIONS

1. Complete one application for each water source (incomplete applications will not be accepted).
2. Attach copy of executed deed, lease agreement, or other possessory interest document for property where water will be used (applicant must own, lease, or obtain written authorization to use water on property).
3. Attach copy of legal access document (e.g. right-of-way, easement, permit) or application for legal access to water withdrawal point and transport route, if applicable, or copy of request or application for legal access to water withdrawal point.
4. Attach driller's well log for drilled wells (if already drilled and available).
5. Attach sketch, photos, plans of water system, or project description (if applicable).
6. Attach legible map that includes meridian, township, range, and section lines such as a subdivision plat, USGS topographical quadrangle, or borough tax map. Indicate location of water withdrawal, route of water transmission, water use area boundary, points of water use within boundary, and point of water return flow (if applicable).
7. Attach copy of approved ADEC water and wastewater system certificate (if applicable).
8. Attach copy of ADNR fish habitat permit (if applicable).
9. Attach notarized Statement of Beneficial Use of Water form and associated fee, if water system and water use are fully developed, and total water use does not exceed 500 gallons of water per day.
10. Attach completed Coastal Project Questionnaire (if applicable - see page 4).
11. Submit non-refundable fee (see page 4).

APPLICANT INFORMATION

Organization Name (if applicable)  Agent or Consultant Name (if applicable)

Individual Applicant Name (if applicable)  Individual Co-applicant Name (if applicable)

Mailing Address  City  State  Zip Code

Daytime Phone Number  Alternate Phone Number (optional)

Fax Number (if available)  E-Mail Address (optional)
### PROPERTY DESCRIPTIONS

**Location of Water Use**

<table>
<thead>
<tr>
<th>Subdivision Name or Survey Number</th>
<th>Lot, Block, or Tract</th>
<th>Meridian</th>
<th>Township</th>
<th>Range</th>
<th>Section</th>
<th>Quarter Sections</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>¼ 1/4</td>
</tr>
</tbody>
</table>

**Location of Water Source**

<table>
<thead>
<tr>
<th>Subdivision Name or Survey Number</th>
<th>Lot, Block, or Tract</th>
<th>Meridian</th>
<th>Township</th>
<th>Range</th>
<th>Section</th>
<th>Quarter Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>¼ 1/4</td>
</tr>
</tbody>
</table>

**Location of Water Return Flow or Discharge (if applicable)**

<table>
<thead>
<tr>
<th>Geographic Name of Water Body or Well Depth</th>
<th>Meridian</th>
<th>Township</th>
<th>Range</th>
<th>Section</th>
<th>Quarter Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>¼ 1/4</td>
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</tbody>
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### WATER SOURCE

**Ground Water**

<table>
<thead>
<tr>
<th>Type (e.g. drilled, dug)</th>
<th>Total Depth (in feet)</th>
<th>Static Water Level (in feet)</th>
<th>Date Completed</th>
<th>Well Production Capacity</th>
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</thead>
</table>

**Surface Water**

<table>
<thead>
<tr>
<th>Type (e.g. stream, lake, spring)</th>
<th>Geographic Name (if named)</th>
</tr>
</thead>
</table>

### METHOD OF TAKING WATER (IF KNOWN)

**Pump**

<table>
<thead>
<tr>
<th>Pump Intake</th>
<th>Pump Output</th>
<th>Hours Working</th>
<th>Hours/Day</th>
<th>Length of Pipe</th>
<th>Length of Pipe (from pump to point of use)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GPM</td>
<td></td>
<td></td>
<td></td>
<td>(feet)</td>
</tr>
</tbody>
</table>

**Gravity**

<table>
<thead>
<tr>
<th>Pipe Diameter</th>
<th>Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
<td>Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diversion Rate</th>
<th>GPM or CFS</th>
</tr>
</thead>
</table>

**Ditch**

| L | H | W | Feet |

**Reservoir**

<table>
<thead>
<tr>
<th>L</th>
<th>H</th>
<th>W</th>
<th>Feet</th>
<th>Water Storage</th>
</tr>
</thead>
</table>

**Dam**

<table>
<thead>
<tr>
<th>L</th>
<th>H</th>
<th>W</th>
<th>Feet</th>
<th>Water Storage</th>
</tr>
</thead>
</table>
### AMOUNT OF WATER

#### Common Water Uses and Standard Amounts

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>How Many</th>
<th>Standard Amounts</th>
<th>Total Amount Requested</th>
<th>Months of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Plumbed Single-family Home</td>
<td># Homes</td>
<td>500 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Includes irrigation of 10,000 sq. ft.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially Plumbed Single-family Home (no hot water heater)</td>
<td># Homes</td>
<td>250 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unplumbed Single-family Home (hand carry water)</td>
<td># Homes</td>
<td>75 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duplex or Triplex</td>
<td># Blds.</td>
<td>1000 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four-plex and Larger Housing</td>
<td># Units</td>
<td>250 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motel or Resort</td>
<td># Rooms</td>
<td>150 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Camps</td>
<td># People</td>
<td>50 GPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic Irrigation</td>
<td># Sq. ft.</td>
<td>250 GPD per 10,000 Sq. ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-domestic irrigation</td>
<td># Acres</td>
<td>0.5 AFY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other Water Uses

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>How Many</th>
<th>Amount</th>
<th>Total Amount Requested</th>
<th>Months of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Expected date for water system and water use to be fully developed or date when existing use started ________.

Note: Pursuant to AS 46.15.160(a)(1). Crimes, a person may not construct works for an appropriation, or divert, impound, withdraw, or use a significant amount of water from any source without a permit, certificate of appropriation, or authorization issued under this chapter.

11 AAC 93.040 sets out the required information on an application for a water right. 11 AAC 93.050 authorizes the commissioner to decide what additional information is needed to process an application for a water right. This information is made a part of the state public water records and becomes public information under AS 40.25.110 and 40.25.120. Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210.
SIGNATURE

The information presented in this application is true and correct to the best of my knowledge. I understand that per 11 AAC 93.040 and 11 AAC 93.050 additional information may be required by the department to adjudicate this application. Failure to provide requested information could result in this file being closed.

______________________________  ______________________________
Signature                                           Date

______________________________  ______________________________
Name (please print)                                   Title (if applicable)

REFERENCES

Measurement Units
GPD = gallons per day
CFS = cubic feet per second
GPM = gallons per minute
AF = acre-feet
AFY = acre-feet per year (325,851 gallons/year)
AFD = acre-feet per day (325,851 gallons/day)
MGD = million gallons per day

Conversion Table

<table>
<thead>
<tr>
<th>5,000 GPD=</th>
<th>30,000 GPD=</th>
<th>100,000 GPD=</th>
<th>500,000 GPD=</th>
<th>1,000,000 GPD=</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 CFS</td>
<td>0.05 CFS</td>
<td>0.2 CFS</td>
<td>0.8 CFS</td>
<td>1.5 CFS</td>
</tr>
<tr>
<td>3.47 GPM</td>
<td>20.83 GPM</td>
<td>68.4 GPM</td>
<td>347.2 GPM</td>
<td>694.4 GPM</td>
</tr>
<tr>
<td>5.60 AFY</td>
<td>33.60 AFY</td>
<td>112.0 AFY</td>
<td>560.1 AFY</td>
<td>1120.1 AFY</td>
</tr>
<tr>
<td>0.2 AFD</td>
<td>0.09 AFD</td>
<td>0.3 AFD</td>
<td>1.5 AFD</td>
<td>3.1 AFD</td>
</tr>
<tr>
<td>0.01 MGD</td>
<td>0.03 MGD</td>
<td>0.1 MGD</td>
<td>0.5 MGD</td>
<td>1.0 MGD</td>
</tr>
</tbody>
</table>

Fees required by regulation 11 AAC 05.010(a)(8)
- $100 for one single-family residence or duplex, or for water use associated with one single-family residence or duplex
- $1,200 for activities related to oil and gas and associated substances
- Fee varies for activities related to locatable minerals, unless the application is filed under 11 AAC 05.010(a)(9)(E)(i) or (9)(F)(i) - contact Water Resources Section for pre-application meeting
- Fee varies for hydroelectric power generation - contact Water Resources Section for pre-application meeting
- Fee varies for water removal out of a hydrologic unit under AS 46.15.035 or 46.15.037 - contact Water Resources Section for pre-application meeting
- $200 for 5,000 GPD or less for a use not listed above
- $450 for greater than 5,000 GPD and no more than 30,000 GPD for a use not listed above
- $550 for greater than 30,000 GPD and no more than 100,000 GPD for a use not listed above
- $900 for greater than 100,000 GPD for a use not listed above

Make checks payable to "Department of Natural Resources."

Coastal Zone
If this appropriation is within the Coastal Zone, and you are planning to use more than 1,000 GPD from a surface water source or 5,000 GPD from a subsurface water source, you need to submit a completed Coastal Project Questionnaire with this application. For more information on the Coastal Zone, contact the Office of Project Management and Permitting; Anchorage 269-7470, Juneau 465-3582, www.dnr.state.ak.us/aomp/.

102-102 (Rev. 2/06)
Page 4 of 4
Water Rights in Alaska

**What are water rights?**
A water right is a legal right to use surface or ground water under the Alaska Water Use Act (AS 46.15). A water right allows a specific amount of water from a specific water source to be diverted, impounded, or withdrawn for a specific use. When a water right is granted, it becomes appurtenant to the land where the water is being used for as long as the water is used. If the land is sold, the water right transfers with the land to the new owner, unless the Department of Natural Resources (DNR) approves its separation from the land. In Alaska, because water wherever it naturally occurs is a common property resource, landowners do not have automatic rights to ground water or surface water. For example, if a farmer has a creek running through his property, he will need a water right to authorize his use of a significant amount of water. Using water without a permit or certificate does not give the user a legal right to use the water.

**How do I obtain a water right?**
To obtain water rights in Alaska, you need to submit an application for water rights to the DNR office in the area of the water use. After your application is processed, you may be issued a permit to drill a well or divert the water. Once you have established the full amount of water that you use beneficially and have complied with all of the permit conditions, a certificate of appropriation may be issued. This is the legal document that establishes water rights.

**What costs are involved?**
An application for water rights must be accompanied by the appropriate filing fee as determined by 11 AAC 05.010(a)(8):
- $100 for one single-family residence or duplex, or for water use associated with one single-family residence or duplex
- $1,200 for activities related to oil and gas and associated substances
- Fee varies for activities related to locatable minerals, unless the application is filed under 11 AAC 05.010(a)(9)(E)(i) or (9)(F)(i) - contact Water Resources Section for pre-application meeting
- Fee varies for hydroelectric power generation - contact Water Resources Section for pre-application meeting
- Fee varies for water removal out of a hydrologic unit under AS 46.15.035 or 46.15.037 - contact Water Resources Section for pre-application meeting
- $200 for 5,000 gallons per day (gpd) or less for a use not listed above
- $450 for greater than 5,000 gpd and no more than 30,000 gpd for a use not listed above
- $550 for greater than 30,000 gpd and no more than 100,000 gpd for a use not listed above
- $900 for greater than 100,000 gpd for a use not listed above

To ensure that the public is notified of proposed water uses, you may be required to pay the cost of a legal advertisement in at least one issue of a local newspaper in the area of the proposed water use. Public notice is required if the appropriation is greater than 5,000 gpd. Public notice may be required for uses of less than 5,000 gpd if the water source is an anadromous fish stream or the water source has a high level of competition among water users. In addition, permit, certificate, and authorization holders are subject to an annual $50 administrative service fee. Water appropriations of 500 gpd or less for any use, appropriations of 1,500 gpd or less for a single-family residence or duplex, and reservations of water for public benefit are exempt from the annual fee.

**Why should I apply for water rights?**
1. If you have water rights, you have legal standing to assert those rights against conflicting water users who do not have water rights.
2. A person with water rights has priority to use water over persons who later file for water rights from the same source.
3. Anyone who diverts, impounds, or withdraws a significant amount of water for use, without a permit, certificate, or authorization is guilty of a misdemeanor (AS 46.15.180). A significant amount of water is defined by 11 AAC 93.035(a) and (b) as:
• the consumptive use of more than 5,000 gallons of water from a single source in a single day;
• the regular daily or recurring consumptive use of more than 500 gpd from a single source for more than 10 days per calendar year;
• the non-consumptive use of more than 30,000 gpd (0.05 cubic feet per second) from a single source; or
• any water use that may adversely affect the water rights of other appropriators or the public interest.

4. By filing for water rights, you provide valuable information about water use and water availability in Alaska. Water right records are updated and maintained in an online database. This system contains data on customers, water right status, water source (well depth or water body name), type of water use, water quantity, period of water use, water right priority date, and property description (meridian, township, range, section, quarter sections, latitude and longitude, subdivision name or survey number, tract, block, and lot). Currently, the water right database has over 24,000 records. This information allows state water managers to estimate present uses of water, determine how much water is available from streams and aquifers in the state, protect established water right holders, prevent over-appropriation of water sources, and manage the state’s water resources.

What other water resources authorizations are available from the Department of Natural Resources?
• **Dam Safety:** A certificate of approval is required for constructing or modifying a dam that impounds 50 acre-feet of water and is at least 10 feet high, or is at least 20 feet high, or poses a threat to life and property. An application form and the fee prescribed by 11 AAC 05.010(a)(8) should be filed with the Department of Natural Resources.
• **Instream Flow:** A certificate is required for maintaining a specific flow in a portion of stream or water level in a lake. An instream flow reservation can be made to protect fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes. An application form and the fee prescribed by 11 AAC 05.010(a)(8) should be filed with the Department of Natural Resources.

**How do I obtain authorization for short-term water use (temporary water use authorization)?**
A temporary water use authorization may be needed if the amount of water to be used is a significant amount, the use continues for less than five consecutive years, and the water to be used is not appropriated. This authorization does not establish a water right but will avoid conflicts with fisheries and existing water right holders. The application fee for a temporary water use authorization is $350 for all uses of water from up to five water sources.

**Where can I get more information?**
More information is available in the Department of Natural Resources' fact sheets on Administrative Service Fee, Dam Safety in Alaska, Reserving Water for Instream Use, Federal Reserved Water Rights, and Alaska Hydrologic Survey. Further information and application forms may be obtained from the following offices or visit [www.dnr.state.ak.us/mlw/water/index.htm](http://www.dnr.state.ak.us/mlw/water/index.htm).

**Department of Natural Resources**
**Water Resources Section**
Anchorage Office
550 West 7th Avenue, Suite 1020
Anchorage, AK 99501-3562
Phone: (907) 269-8600
Fax: (907) 269-8947

Fairbanks Office
3700 Airport Way
Fairbanks, AK 99709-4699
Phone: (907) 451-2790
Fax: (907) 451-2703

Juneau Office
PO Box 111020
400 Willoughby Avenue
Juneau, AK 99811-1020
Phone: (907) 465-3400
Fax: (907) 586-2954
Chuck Kaucic

From: Deats, Theodore A (DNR) [ted.deats@alaska.gov]
Sent: Monday, August 22, 2011 4:22 PM
To: chuck@arwa.org
Cc: Bussard, Daniel P (DNR); Deats, Theodore A (DNR)
Subject: Skagway Water Rights Request

Chuck,

The City of Skagway has 3 Water Right Certificates:

<table>
<thead>
<tr>
<th>ADL</th>
<th>43985</th>
<th>WATER RIGHTS</th>
<th>CERTIFICATE ISSUE</th>
<th>OWNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADL</td>
<td>43986</td>
<td>WATER RIGHTS</td>
<td>CERTIFICATE ISSUE</td>
<td>OWNER</td>
</tr>
<tr>
<td>ADL</td>
<td>43987</td>
<td>WATER RIGHTS</td>
<td>CERTIFICATE ISSUE</td>
<td>OWNER</td>
</tr>
</tbody>
</table>

**Case File:**

See Case Abstract

- **Customer id:** 000127461  |  SKAGWAY CITY OF
- **Case Status:** CERTIFICATE ISSUED  |  Status Date: 06/25/1968
- **Other num:** C0000077  |  File Location: WATER MGT-JUNEAU

**Source:** A  |  **Source Type:** DRILLED WELL  |  **Priority Date:** 12/31/1897
- **Well depth:** 80.00  |  **Date Completed:** NOT ON FILE
- **Meridian:** C  |  **Township:** 028S  |  **Range:** 059E  |  **Section:** 12  |  **Quarter Section:** NW  |  **Quarter of Quarter Section:** NE
- **Latitude:** 592756.5  |  **Longitude:** 13518200W

- **Usage:** A  |  **Sic Code:** 4941  |  **PUBLIC WATER SUPPLY**
| **Quantity:** 504000.0  |  **Gallons / Day**  |  **Starting MM/DD:** 01/01  |  **Ending MM/DD:** 12/31

- **Subdivision:** CM,T28S,R59E,SEC12,NENW
- **Creek, River, Lake:** None
- **Additional Information:** None
Case File:

See Case Abstract

Customer id: 000127461 SKAGWAY CITY OF

Case Status: CERTIFICATE ISSUED Status Date: 06/25/1968

Other num: C0000079 File Location: WATER MGT-JUNEAU

Source: A Source Type: STREAM OR RIVER Priority Date: 12/31/1897

Meridian: C Township: 027S Range: 059E Section: 35 Quarter Section: SW Quarter of Quarter Section: NE

Latitude: 592855.5 Longitude: 1351597W

Usage: A Sic Code: 4941 PUBLIC WATER SUPPLY

Quantity: 5000.0 Gallons / Day Starting MM/DD: 01/01 Ending MM/DD: 12/31

Subdivision: CM, T27S, R59E, SEC 35, NESW

Creek, River, Lake: None

Additional Information:

WEST CK-DYEA VALLEY AREA

Case File:

See Case Abstract

Customer id: 000127461 SKAGWAY CITY OF

Case Status: CERTIFICATE ISSUED Status Date: 06/25/1968

Other num: C0000078 File Location: WATER MGT-JUNEAU

Source: A Source Type: LAKE OR OUTLET Priority Date: 12/31/1898

Meridian: C Township: 028S Range: 059E Section: 13 Quarter Section: NW Quarter of Quarter Section: SW

Latitude: 592624.8 Longitude: 13515546W

Usage: A Sic Code: 4941 PUBLIC WATER SUPPLY

Quantity: 3000000.0 Gallons / Day Starting MM/DD: 01/01 Ending MM/DD: 12/31

Source: B Source Type: LAKE OR OUTLET Priority Date: 12/31/1898

Meridian: C Township: 028S Range: 059E Section: 13 Quarter Section: NW Quarter of Quarter Section: NE

Latitude: 592624.8 Longitude: 13515546W

Usage: A Sic Code: 4941 PUBLIC WATER SUPPLY

Quantity: 3000000.0 Gallons / Day Starting MM/DD: 01/01 Ending MM/DD: 12/31
<table>
<thead>
<tr>
<th>Section: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 592651.9</td>
</tr>
</tbody>
</table>

**Usage:** A  **SIC Code:** 4941  **PUBLIC WATER SUPPLY**  
**Quantity:** 0.0  **Gallons / Day**  **Starting MM/DD:** 01/01  **Ending MM/DD:** 12/31

**Subdivision:** CM, T28S, R59E, SEC13, SWNW

**Creek, River, Lake:** None

**Additional Information:**

DEWEY LAKES

---

**From:** Chuck Kaucic [mailto:chuck@arwa.org]  
**Sent:** Monday, August 22, 2011 3:19 PM  
**To:** Deats, Theodore A (DNR)  
**Subject:** FW: Wasilla Water rights request

TD,  
Here is an example.  
TX.

CK

**Chuck Kaucic**  
**Source Water Protection Specialist**  
Alaska Rural Water Association  
1075 Check Street, Suite 106  
Wasilla, AK 99654-8067

Office: 907.357.1155  
Fax: 907.357.1400  
Cell: 907.631.8158  
Email: chuck@arwa.org  
www.arwa.org

Click here to join Alaska Rural Water Association today
APPENDIX H

POTENTIAL & EXISTING CONTAMINANT SOURCES