Source Water Assessment

A Hydrogeologic Susceptibility and Vulnerability Assessment for Alaska Tok Water Drinking Water System, Tok, Alaska

PWSID # 381765.001

June 2004

DRINKING WATER PROTECTION PROGRAM REPORT 1478
Alaska Department of Environmental Conservation

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Alaska Tok Water
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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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Source Water Assessment for Alaska Tok Water Source of Public Drinking Water, Tok, Alaska

Drinking Water Protection Program
Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

Alaska Tok Water has one Public Water System (PWS) well. It is assumed that the well (PWSID# 381765.001) has been used as a drinking water source since it was drilled in 1998.

The well is a Class B (transient/non-community) water system located in Tok, Alaska. Available records do not indicate if there is secondary storage of drinking water. The untreated drinking water source is derived directly from the wellhead. Available records do not indicate if this system operates year round, but is assumed to. This well serves approximately 0 non-residents and 50 residents through one service connection. The wellhead received a susceptibility rating of **Low** and the aquifer received a susceptibility rating of **High**. Combining these two ratings produce a **Low** rating for the natural susceptibility of the well.

Identified potential and current sources of contaminants for the primary public drinking water source are many and include, but are not limited to: an aboveground fuel tank, a large capacity septic system, campgrounds and RV parks, electric power generation (fossil fuels), gasoline station (with repair shop), residential areas, and roads (See Table 1). These identified potential and existing sources of contamination are considered as sources of bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals. Overall, the water well received a vulnerability rating of **High** for the bacteria and viruses, and **High** for nitrates and nitrites, and a vulnerability rating of **High** for volatile organic chemicals contaminant categories.

ALASKA TOK WATER PUBLIC DRINKING WATER SYSTEM

The Alaska Tok Water well is a Class B (transient/non-community) public water system. The well is located in Tok, Alaska. (Sec. 18, T018N, R013E, Copper River Meridian; see Map A of Appendix A). Tok is located at the junction of the Alaska Highway and the Tok Cutoff to the Glenn Highway, at 1,635' elevation, 200 miles southeast of Fairbanks. It is 93 miles from the Canadian border and is the first major community upon entering Alaska. The community of Tok has a population of 1,435 (ADCED, 2003). Average annual precipitation in Tok is 11 inches, with 33 inches of snow. Tok has an extreme temperature range, from –71 to 99.

The community of Tok obtains most of their water supply from individual wells. Over half of households have individual septic tanks and the remaining households utilize outhouses or honeybuckets (ADCED, 2003). Tok receives electrical power from Alaska Power Company, which is operated privately. Power generating facilities are diesel. Refuse is collected by JD Refuse and transported to the local landfill, which is operated by JD Refuse Service (ADCED, 2003).

According to information supplied by ADEC for the Alaska Tok Water PWS, the depth of the primary water well is 120 feet below the ground surface. The well is not screened and is completed in an unconfined aquifer. Unconfined aquifers are more susceptible to groundwater impacts resulting from the downward migration of surface contaminants. The well is not located within a floodplain.

Information acquired from a November 1999 sanitary survey for the public water system indicated that the land surface was sloped away from the well. Generally, land surfaces that slope away from the wellhead promote surface water drainage, which reduces potential of contaminant migration down the well casing annulus. The well is grouted according to ADEC regulations. Proper grouting provides added protection against contaminants traveling along the well casing annulus and into source waters.

Tok is in the eastern reaches of the Tanana-Kuskokwim Lowland, a broad depression bordering the Alaska Range on the north. Coalescing alluvial fans composed of moderately well-sorted silt, sand and gravel are the principal surficial deposits in the Tok area. The thickness of the unconsolidated material is estimated to be as much as 760 meters. Not all of this thickness is alluvium; however,

because alluvial deposits are typically not deposited below sea level. It is likely that deep sediments in the area are poorly sorted lacustrine, glacial, or marine sediments of low permeability. The area was glaciated in at least three episodes, which is evidenced by the presence of terminal moraines in the Delta and Gerstle River valleys and in the valleys of several small creeks draining the north face of the Alaska Range. Five major soil types exist in the Big Delta area: Salchaket, Jarvis, Nenana, Chena, and Tanana. These soils range in drainage from the somewhat poorly drained Salchaket to well drained Chena. The area lies in the discontinuous permafrost zone (Nelson, 1995).

ALASKA TOK WATER DRINKING WATER PROTECTION AREA

In order to evaluate whether a drinking water source is at risk, we must first evaluate what are the most likely pathways for surface contamination to reach the groundwater. 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 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 Alaska Tok Water PWS. The input parameters describing the attributes of the aquifer in this calculation were adopted from Groundwater (Freeze and Cherry, 1979). Available geology and groundwater contours were also considered to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at a meaningful protection area.

The protection areas established for wells by the ADEC are usually separated into four zones, limited by the watershed. These zones correspond to differences in the time-of-travel (TOT) of the water moving through the aquifer to the well (Please refer to the Guidance Manual for Class B Public Water Systems for additional information).

The time of travel for contaminants within the water varies and is dependent on the physical and chemical characteristics of each contaminant. The following is a summary of the four protection area zones for wells and the calculated time-of-travel for each:

Table 1. Definition of Zones

Zone	Definition
A	¼ the distance for the 2-yr. time-of-travel
B	Less than the 2 year time-of-travel
C	Less Than the 5 year time-of-travel
D	Less than the 10 year time-of-travel

The DWPA for the Alaska Tok Water PWS was determined using an analytical calculation and includes Zones A, B, C, and D (See Map A of Appendix A).

INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES

The Drinking Water Protection Program has completed an inventory of potential and existing sources of contamination within the Alaska Tok Water DWPA. This inventory was completed through a search of agency records and other publicly available information. Potential sources of contamination to the drinking water aquifer include a wide range of categories and types. 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 B public water system assessments, three categories of drinking water contaminants were inventoried. They include:

- Bacteria and viruses,
- Nitrates and/or nitrites,
- Volatile organic chemicals.

The sources are displayed on Map C of Appendix C and summarized in Table 1 of Appendix B.

RANKING OF CONTAMINANT RISKS

Once the potential and existing sources of contamination have been identified, they are 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 function of toxicity and volumes of specific contaminants associated with that source. Rankings include:

- Low,
- Medium,

- High, and
- Very High.

The time-of-travel for contaminants within the water varies and is dependent on the physical and chemical characteristics of each contaminant. 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 4 in Appendix B contain the ranking of potential and existing sources of contamination with respect to bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals.

VULNERABILITY OF THE ALASKA TOK WATER 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 eight 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 naturally occurring attributes of the water source and influences on the groundwater system that might lead to contamination. 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 contamination that has or may have occurred, but has not arrived or been detected at the well. Lastly, Chart 4 contains the 'Vulnerability Analysis for Bacteria and Viruses'. Charts 5 through 8 contain the Contaminant Risks and Vulnerability Analyses for nitrates and nitrites and volatile 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:

Natural Susceptibility Ratings	
40 to 50 pts	Very High
30 to < 40 pts	High
20 to < 30 pts	Medium
< 20 pts	Low

The Alaska Tok Water's water well is completed in an unconfined aquifer. Unconfined aquifers are more susceptible to potential groundwater quality impacts posed by the migration of surface water contaminants downward from the surface. Table 2 shows the susceptibility scores and ratings for this PWS.

Table 2. Susceptibility

	Score	**Rating**
Susceptibility of the Wellhead	0	Low
Susceptibility of the Aquifer	18	High
Natural Susceptibility	18	Low

Contaminant risks to a drinking water source depend on the type, number or density, and distribution of contaminant sources. This score has been derived from an examination of existing and historical contamination that has been detected at the drinking water source through routine sampling. It also evaluates potential sources of contamination. Flow charts are used to assign a point score, and ratings are assigned in the same way as for the natural susceptibility:

Contaminant Risk Ratings	
40 to 50 pts	Very High
30 to < 40 pts	High
20 to < 30 pts	Medium
< 20 pts	Low

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

Table 3. Contaminant Risks

Category	Score	Rating
Bacteria and Viruses	50	Very High
Nitrates and/or Nitrites	50	Very High
Volatile Organic Chemicals	47	Very High

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:

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

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

Table 4. Overall Vulnerability

Category	Score	Rating
Bacteria and Viruses	70	High
Nitrates and Nitrites	70	High
Volatile Organic Chemicals	65	High

Bacteria and Viruses

The contaminant risk for bacteria and viruses is **Very High**. The risk is primarily attributed to the presence of large-capacity septic systems located in Zone A (see Table 2 – Appendix B).

Coliforms (a bacteria) are found naturally in the environment and although they aren't necessarily a health threat, they are 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. Harmful bacteria can cause diarrhea, cramps, nausea, headaches, or other symptoms (EPA, 2003). Positive samples increase the overall vulnerability of the drinking water source, indicating that the source is susceptible to bacteria and virus contamination.

No positive bacteria counts have been reported in recent (within five years) sampling events (See Chart 3 – Contaminant Risks for Bacteria and Viruses in Appendix D). Only a small amount of bacteria and viruses are required to endanger public health.

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 **High**.

Nitrates and Nitrites

The contaminant risk for nitrates and nitrites is **Very High**. The risk to this source of public drinking water is primarily attributed to the presence of large-capacity septic systems in Zone A (see Table 3 – Appendix B).

Nitrates are very mobile, moving at approximately the same rate as water. The sampling history for this well indicates that low levels of nitrates have been detected in recent sampling events. However, the reported concentrations of nitrates do not exceed the maximum contaminant level (MCL) of 10 mg/L. Nitrate concentrations in uncontaminated groundwater are typically less than 2 mg/L; therefore, nitrate concentrations above 2 mg/L may be indicative of man-made sources (See Chart 5 - Contaminant Risks for Nitrates and/or Nitrites in Appendix D).

Nitrate levels are often derived from the decomposition of organic matter in soils. Although the nitrate source is unknown, such occurrences may be attributed to septic systems or other sources. After combining the contaminant risk for nitrates and nitrites with the natural susceptibility of the well, the overall vulnerability of the well to nitrate and nitrite contamination is **High**.

Volatile Organic Chemicals

The contaminant risk for volatile organic chemicals is **Very High**. The risk is primarily attributed to the presence of underground fuel tanks, gasoline stations, DEC recognized contaminated sites, and motor vehicle waste disposal wells located in Zone A. Many other potential contaminant sources are also found within the protection area (see Table 4 – Appendix B).

All recent sampling data available in ADEC records for Alaska Tok Water was below detection levels (See Chart 7 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).
After combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is **High**.

Using the Source Water Assessment

This assessment of contaminant risks can be used as a foundation for local voluntary protection efforts as well as a basis for the continuous efforts on the part of Tok to protect public health. It is anticipated that Source Water Assessments will be updated every five years to reflect any changes in the vulnerability and/or susceptibility of the drinking water source.

REFERENCES

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Alaska Department of Environmental Conservation, Contaminated Sites Database, 2003 [WWW database], URL http://www.state.ak.us/dec/dspar/csites/cs_search.htm

Alaska Department of Environmental Conservation, Leaking Underground Storage Tank Database, 2003 [WWW database], URL http://www.dec.state.ak.us/spar/stp/ust/search/fac_search.asp

Nelson, Gordon L. 1995. Overview of Environmental and Hydrogeologic Conditions near Big Delta, Alaska. U.S. Geological Survey Open File Report 95-180 (prepared in cooperation with the FAA).

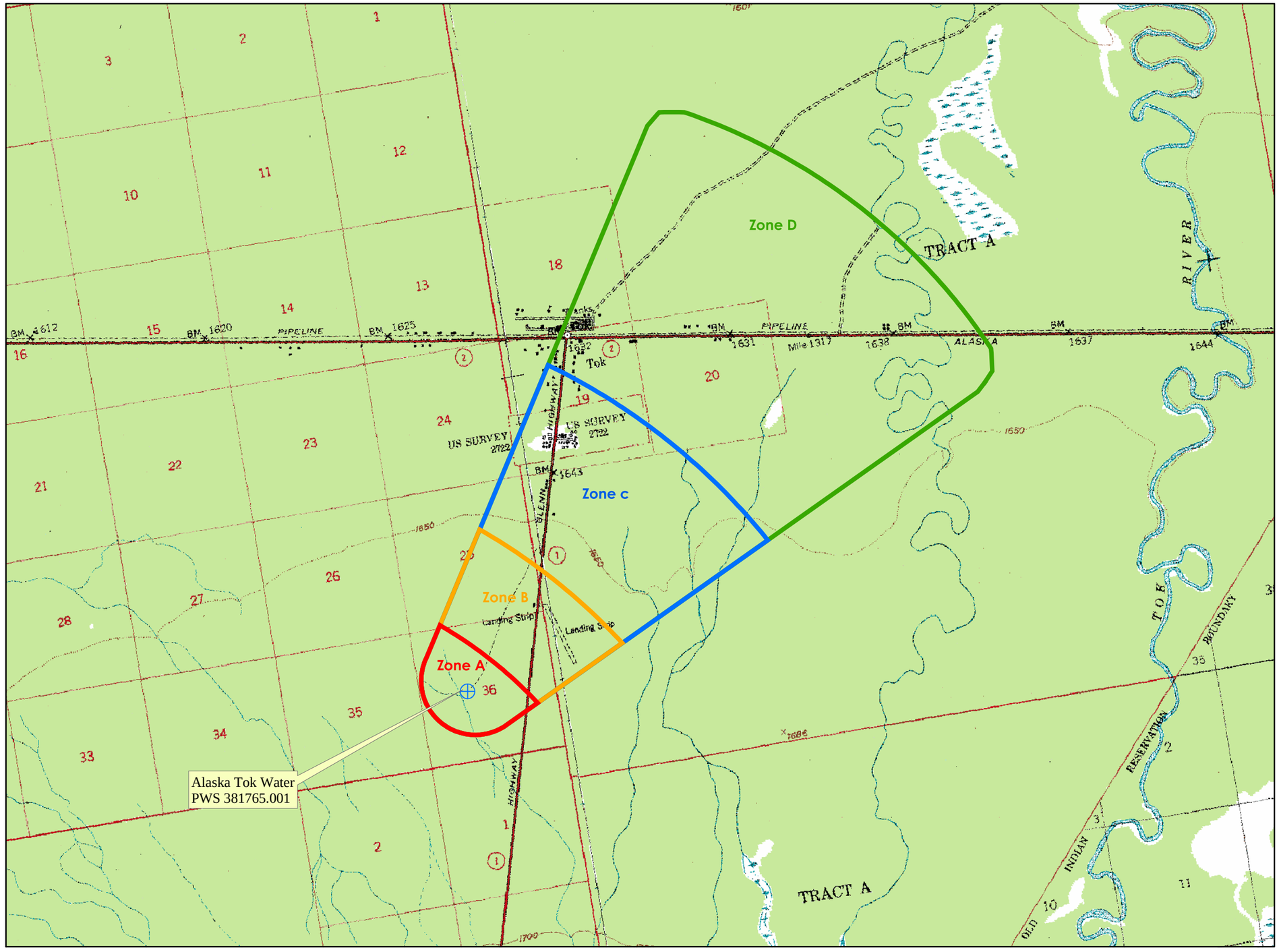
Freeze, R. A., and Cherry, J.A. 1979, Groundwater, Prentice-Hall, Englewood Cliffs, New Jersey

United States Environmental Protection Agency (EPA), 2002 [WWW document]. URL http://www.epa.gov/safewater/mcl.html.

APPENDIX A

Drinking Water Protection Area Location Map
(Map A)

Public Water Well System for PWSID 381765.001 Alaska Tok Water



LEGEND

- Public Water System Well

Groundwater Protection Zones

- Zone A – 2 Months Travel Time
- Zone B – 2 Years Travel Time
- Zone C – 5 Years Travel Time
- Zone D – 10 Years Travel Time or Watershed Boundary

Hydrography/Physical

- Parcels
- Stream
- Lake or Pond
- Contours

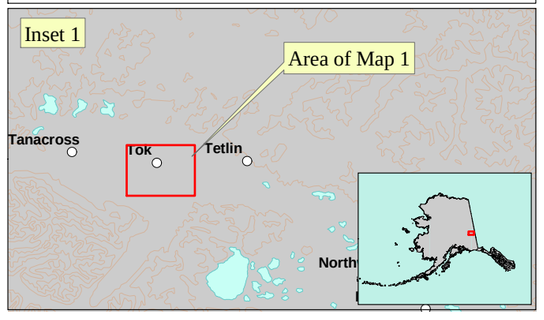
Transportation

- Primary Route (Class 1)
- Secondary Route (Class 2)
- Road (Class 3)
- Road (Class 4)
- Road (Class 5, Four-wheel drive)
- Road Ferry Crossing

Data Sources:
- Contaminant Sources, Public Water System Wells, Contours
  Alaska Department of Environmental Conservation (ADEC)
- Critical Facilities, Federal Emergency Management Agency (FEMA)

All other data:
- United States Geological Survey (USGS)
- Drinking Water Protection Areas based on "Alaska Drinking Water Protection Program - Guidance Manual for Class A Public Water Systems" published by ADEC

URS Corporation does not guarantee the accuracy or validity of the data provided.



0 0.35 0.7 1.4 2.1 2.8 Miles

Alaska Tok Water
PWS 381765.001
Appendix A Map A

APPENDIX B

Contaminant Source Inventory and Risk Ranking (Tables 1-7)

Table 1

Contaminant Source Inventory for ***Alaska Tok Water***

PWSID 381765.00

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	C	
Residential Areas	R01	R01-01	A	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-01	A	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-01	B	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-02	C	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-03	C	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-04	C	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Statu Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-05	C	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-06	C	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-07	C	C	AKGATEWAY SD-TOK SCHOOL FLD
Tanks, diesel (above ground)	T06	T06-01	C	C	AKGATEWAY SD-TOK SCHOOLS
Tanks, diesel (above ground)	T06	T06-02	C	C	
Tanks, gasoline (above ground)	T10	T10-01	C	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-02	C	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-03	C	C	
Tanks, heating oil, nonresidential (underground)	T16	T16-01	C	C	
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-12	C	C	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	C	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-01	D	C	ADOTPF - O'BRIEN CREEK
Gasoline stations (without repair shop)	C15	C15-02	D	C	ADOTPF - TOK
Gasoline stations (without repair shop)	C15	C15-03	D	C	ADOTPF - TOK
Gasoline stations (with repair shop)	C16	C16-01	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Motor /motor vehicle repair shops	C31	C31-01	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Domestic wastewater collection systems (sewer lines or lift stati	D01	D01-01	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-08	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-09	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-10	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-11	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-12	D	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-13	D	C	KNOB RIDGE MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-14	D	C	KNOB RIDGE MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-15	D	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-16	D	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-17	D	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-18	D	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-19	D	C	40 - MILE AIR LTD.

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-20	D	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-21	D	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-22	D	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-23	D	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfie Disposal Method)	D10	D10-24	D	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-01	D	C	TOK SAVEWAY
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-02	D	C	TOK SAVEWAY
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-03	D	C	FORMER VETERAN'S AIR SERVICE INC
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-04	D	C	ADFG -
Residential Areas	R01	R01-02	D	C	ADOT/PF Tok HOT 234-3G, Reckey # 1992330934901, Status: Inactive Closure of HOT that failed Tracer Tight (TT) leak test indicates contami as great as 9000 ppm at depth of 11 feet. Excavation has been filled with clean soil.
Tanks, diesel (underground)	T08	T08-01	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-02	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-03	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-04	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-05	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-06	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	U08-03	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	U08-05	D	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	U08-06	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-01	D	C	YOUNG'S CHEVRON

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Closed tanks, diesel (underground)	T09	T09-02	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-03	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-04	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-05	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-06	D	C	YOUNG'S CHEVRON
Closed tanks, diesel (underground)	T09	T09-07	D	C	
Closed tanks, diesel (underground)	T09	T09-08	D	C	
Closed tanks, diesel (underground)	T09	T09-09	D	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (above ground)	T10	T10-02	D	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-01	D	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-02	D	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-03	D	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-04	D	C	TOK POWER PLANT
Tanks, gasoline (underground)	T12	T12-05	D	C	USCG - LORSTA TOK
Tanks, gasoline (underground)	T12	T12-06	D	C	USCG - LORSTA TOK
Tanks, gasoline (underground)	T12	T12-07	D	C	CARSON TURBO HELICOPTERS
Closed tanks, gasoline (underground)	T13	T13-01	D	C	CARSON TURBO HELICOPTERS
Closed tanks, gasoline (underground)	T13	T13-02	D	C	US BORDER STATIONTok
Closed tanks, gasoline (underground)	T13	T13-03	D	C	US BORDER STATIONTok
Closed tanks, gasoline (underground)	T13	T13-04	D	C	US BORDER STATIONTok
Closed tanks, gasoline (underground)	T13	T13-05	D	C	ADOTPF - Tok Maintenance Station
Closed tanks, gasoline (underground)	T13	T13-06	D	C	ADOTPF - Tok Maintenance Station
Closed tanks, gasoline (underground)	T13	T13-07	D	C	ADOTPF - Tok Maintenance Station

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Closed tanks, gasoline (underground)	T13	T13-08	D	C	ADOTPF - Tok Maintenance Station
Closed tanks, gasoline (underground)	T13	T13-09	D	C	ADOTPF - TOK MAINTENANCE
Closed tanks, gasoline (underground)	T13	T13-10	D	C	ADOTPF - TOK MAINTENANCE
Closed tanks, gasoline (underground)	T13	T13-11	D	C	ADOTPF - TOK MAINTENANCE
Closed tanks, gasoline (underground)	T13	T13-12	D	C	ADOTPF - TOK MAINTENANCE
Tanks, heating oil, nonresidential (underground)	T16	T16-02	D	C	ADOTPF - TOK MAINTENANCE
Tanks, heating oil, nonresidential (underground)	T16	T16-03	D	C	WILLARD'S AUTO, ELEC, & GAS
Tanks, heating oil, nonresidential (underground)	T16	T16-04	D	C	WILLARD'S AUTO, ELEC, & GAS
Closed tanks, heating oil, nonresidential (underground)	T17	T17-01	D	C	NORTHSTAR - PCA TRUCKSTOP & CAFE
Closed tanks, heating oil, nonresidential (underground)	T17	T17-02	D	C	NORTHSTAR - PCA TRUCKSTOP & CAFE
Closed tanks, heating oil, nonresidential (underground)	T17	T17-03	D	C	NORTHSTAR - PCA TRUCKSTOP & CAFE
Closed tanks, heating oil, nonresidential (underground)	T17	T17-04	D	C	NORTHSTAR - PCA TRUCKSTOP & CAFE
Closed tanks, heating oil, nonresidential (underground)	T17	T17-05	D	C	NORTHSTAR - PCA TRUCKSTOP & CAFE
Closed tanks, lubricants or other petroleum products (undergrour	T21	T21-01	D	C	CROZIER INVESTMENTS
Closed tanks, lubricants or other petroleum products (undergrour	T21	T21-02	D	C	PARKER HOUSE
Closed Wastewater Holding Tank	T23	T23-01	D	C	THREE BEARS
Closed Wastewater Holding Tank	T23	T23-02	D	C	Tanacross Administrative Site
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-01	D	C	Tanacross Airfield
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-02	D	C	Alaska Power & Telephone
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-03	D	C	Alaska Power & Telephone
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-04	D	C	Tok USCG Loran Station
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-05	D	C	MI OIL CO, INC./10-20 CB
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-06	D	C	BLM-40 MI RESOURCE/TOK WELL

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-07	D	C	BLM-WALKER FORK CAMPGROUND
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-08	D	C	GATEWAY SALMON BAKE/KRANENBURG
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-09	D	C	GOLDEN BEAR CAMPER PARK
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-10	D	C	SHEFFIELD TOK
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U04-11	D	C	SHEN BIBLE CAMP
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-01	D	C	TOK-COMBINED FAC
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-02	D	C	TOK-COMMUNITY CENTER
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-03	D	C	TOK-LODGE MOTEL
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-04	D	C	TOK-LODGE QUICK STOP
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-05	D	C	TOK-RV PARK
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-06	D	C	WADSWORTH CAMPER CITY/CABANA
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-07	D	C	YOUNGS CAFÉ
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-08	D	C	HUSKY LOUNGE
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-09	D	C	1260 INN
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-10	D	C	ADOTPF MAINTENANCE STATION
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-11	D	C	VILLAGE TEXACO
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-02	D	C	IRON DOG OUTFITTERS
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-04	D	C	WADSWORTH TEXACO
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-07	D	C	ADOT&PF Northway Maintenance Camp, Reckey # 1988330111101, St Inactive Undetermined amount of fuel spilled during operation of pipelin contaminated the groundwater supply. Dates, amount of release, and heal impact are unknown.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-08	D	C	Walter Northway School

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-09	D	C	Tok River Wayside Campground, Reckey #1988330129108, Status: Inact Well at campground found to contain benzene in 1983. Original date of s type of fuel, and extent of contamination unknown. Possible source: 197 heating oil contamination.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-10	D	C	USCG Tok Loran Station, Reckey #1988330129120, Status: Inactive We casing reportedly filled by mistake during fuel delivery in early 1980's. Amount unknown. Old Army Haines-Fairbanks fuel line is also in the are Unknown contamination extent.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-11	D	C	Tundra Lodge and RV Park, Reckey #1990330116301, Status: No further remedial action planned. A leaking heating oil tank was discovered during testing on 6/12/90, tank is a 10,000 gallon heating oil tank. Groundwater 60' and is contaminated.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-12	D	C	FDIC 40-Mile Roadhouse, Tetlin Jct.
Campgrounds and RV Parks	X35	X35-01	D	C	Alaska Power & Telephone, Reckey #1991330131202, Status: Closed Diesel fuel leak from day tank inside of building.
Electric power generation (fossil fuels)	X36	X36-01	D	C	Tok Tesoro, Reckey #1991330931201, Status: Inactive, Leaking UST sto leaded, unleaded gas and/or diesel. Also surface spills from overflowing of bulk tanks.

Table 2

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water Sources of Bacteria and Viruses

PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	High	C	
Residential Areas	R01	R01-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	High	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-02	C	High	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-03	C	High	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	High	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	High	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	High	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	High	C	AKGATEWAY SD-TOK SCHOOL FLD
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-08	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-09	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-10	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-11	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-12	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-13	D	High	C	KNOB RIDGE MICROWAVE REPEATER

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water Sources of Bacteria and Viruses

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-14	D	High	C	KNOB RIDGE MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-15	D	High	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-16	D	High	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-17	D	High	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-18	D	High	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-19	D	High	C	40 - MILE AIR LTD.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-20	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-21	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-22	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-23	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-24	D	High	C	NORTHERN ENERGY CORP.

Table 3

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water
Sources of Nitrates/Nitrites

PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	High	C	
Residential Areas	R01	R01-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	High	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-02	C	High	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-03	C	High	C	TOK JUNCTION MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	High	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	High	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	High	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	High	C	AKGATEWAY SD-TOK SCHOOL FLD
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-08	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-09	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-10	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-11	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-12	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Nitrates/Nitrites

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-13	D	High	C	KNOB RIDGE MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-14	D	High	C	KNOB RIDGE MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-15	D	High	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-16	D	High	C	CATHEDRAL MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-17	D	High	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-18	D	High	C	BEAVER CREEK MICROWAVE REPEATER
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-19	D	High	C	40 - MILE AIR LTD.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-20	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-21	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-22	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-23	D	High	C	NORTHERN ENERGY CORP.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-24	D	High	C	NORTHERN ENERGY CORP.

Table 4

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water
Sources of Volatile Organic Chemicals

PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	Low	C	
Residential Areas	R01	R01-01	A	Low	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-01	A	Low	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	Low	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	Low	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	Low	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	Low	C	AKGATEWAY SD-TOK SCHOOL FLD
Tanks, diesel (above ground)	T06	T06-02	C	Medium	C	
Tanks, gasoline (above ground)	T10	T10-01	C	Medium	C	
Tanks, gasoline (above ground)	T10	T10-01	C	Medium	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-02	C	Low	C	
Tanks, heating oil, nonresidential (underground)	T16	T16-01	C	Low	C	
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-12	C	High	C	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	High	C	
Gasoline stations (without repair shop)	C15	C15-01	D	High	C	ADOTPF - O'BRIEN CREEK

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Volatile Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-02	D	High	C	ADOTPF - TOK
Gasoline stations (without repair shop)	C15	C15-03	D	High	C	ADOTPF - TOK
Gasoline stations (with repair shop)	C16	C16-01	D	High	C	6TH INF.DIV.(LT.)& U.S.ARMY GAR.
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-01	D	High	C	TOK SAVEWAY
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-02	D	High	C	TOK SAVEWAY
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-03	D	High	C	FORMER VETERAN'S AIR SERVICE INC
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-04	D	High	C	ADFG -
Tanks, diesel (underground)	T08	T08-01	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-02	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-03	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-04	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-05	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	T08-06	D	High	C	YOUNG'S CHEVRON
Tanks, gasoline (underground)	T12	T12-01	D	High	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-02	D	High	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-03	D	High	C	WESTMARK INN (TUNDRA LODGE)
Tanks, gasoline (underground)	T12	T12-04	D	High	C	TOK POWER PLANT
Tanks, gasoline (underground)	T12	T12-05	D	High	C	USCG - LORSTA TOK
Tanks, gasoline (underground)	T12	T12-06	D	High	C	USCG - LORSTA TOK

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Volatile Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Tanks, gasoline (underground)	T12	T12-07	D	High	C	CARSON TURBO HELICOPTERS
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-01	D	High	C	Tanacross Airfield
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-02	D	High	C	Alaska Power & Telephone
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-03	D	High	C	Alaska Power & Telephone
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-04	D	High	C	Tok USCG Loran Station
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-05	D	High	C	MI OIL CO, INC./10-20 CB
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-06	D	High	C	BLM-40 MI RESOURCE/TOK WELL
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-07	D	High	C	BLM-WALKER FORK CAMPGROUND
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-08	D	High	C	GATEWAY SALMON BAKE/KRANENBURG
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-09	D	High	C	GOLDEN BEAR CAMPER PARK
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-10	D	High	C	SHEFFIELD TOK
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-11	D	High	C	SHEN BIBLE CAMP
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-01	D	High	C	TOK-COMBINED FAC
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-02	D	High	C	TOK-COMMUNITY CENTER
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-03	D	High	C	TOK-LODGE MOTEL

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Volatile Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-04	D	High	C	TOK-LODGE QUICK STOP
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-05	D	High	C	TOK-RV PARK
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-06	D	High	C	WADSWORTH CAMPER CITY/CABANA
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-07	D	High	C	YOUNGS CAFÉ
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-08	D	High	C	HUSKY LOUNGE
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-09	D	High	C	1260 INN
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-10	D	High	C	ADOTPF MAINTENANCE STATION
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-11	D	High	C	VILLAGE TEXACO
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-02	D	High	C	IRON DOG OUTFITTERS
Tanks, diesel (underground)	T08	U08-03	D	High	C	YOUNG'S CHEVRON
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-04	D	High	C	WADSWORTH TEXACO
Tanks, diesel (underground)	T08	U08-05	D	High	C	YOUNG'S CHEVRON
Tanks, diesel (underground)	T08	U08-06	D	High	C	YOUNG'S CHEVRON
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-07	D	High	C	ADOT&PF Northway Maintenance Camp, Reckey # 1988330111101, Sta Inactive Undetermined amount of fuel spilled during operation of pipeline contaminated the groundwater supply. Dates, amount of release, and healt impact are unknown.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-08	D	High	C	Walter Northway School

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Volatile Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-09	D	High	C	Tok River Wayside Campground, Reckey #1988330129108, Status: Inacti Well at campground found to contain benzene in 1983. Original date of sp type of fuel, and extent of contamination unknown. Possible source: 1976 heating oil contamination.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-10	D	High	C	USCG Tok Loran Station, Reckey #1988330129120, Status: Inactive Wel casing reportedly filled by mistake during fuel delivery in early 1980's. Amount unknown. Old Army Haines-Fairbanks fuel line is also in the area. Unknown contamination extent.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-11	D	High	C	Tundra Lodge and RV Park, Reckey #1990330116301, Status: No further remedial action planned. A leaking heating oil tank was discovered during testing on 6/12/90, tank is a 10,000 gallon heating oil tank. Groundwater i 60' and is contaminated.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-12	D	High	C	FDIC 40-Mile Roadhouse, Tetlin Jct.

Table 5

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	Low	C	
Residential Areas	R01	R01-01	A	Low	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-01	A	Low	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	Low	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	Low	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	Low	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	Low	C	AKGATEWAY SD-TOK SCHOOL FLD
Tanks, gasoline (above ground)	T10	T10-01	C	Medium	C	
Tanks, gasoline (above ground)	T10	T10-01	C	Medium	C	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-02	C	Low	C	
Tanks, heating oil, nonresidential (underground)	T16	T16-01	C	Low	C	
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-12	C	Low	C	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	Low	C	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-01	D	High	C	TOK SAVEWAY

Table 5 (continued)

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-02	D	High	C	TOK SAVEWAY
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-03	D	High	C	FORMER VETERAN'S AIR SERVICE INC
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-04	D	High	C	ADFG -

Table 6

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water
Sources of Synthetic Organic Chemicals

PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	Low	C	
Residential Areas	R01	R01-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	Low	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	Low	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	Low	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	Low	C	AKGATEWAY SD-TOK SCHOOL FLD
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-12	C	Low	C	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	Low	C	

Table 7

Contaminant Source Inventory and Risk Ranking for Alaska Tok Water
Sources of Other Organic Chemicals

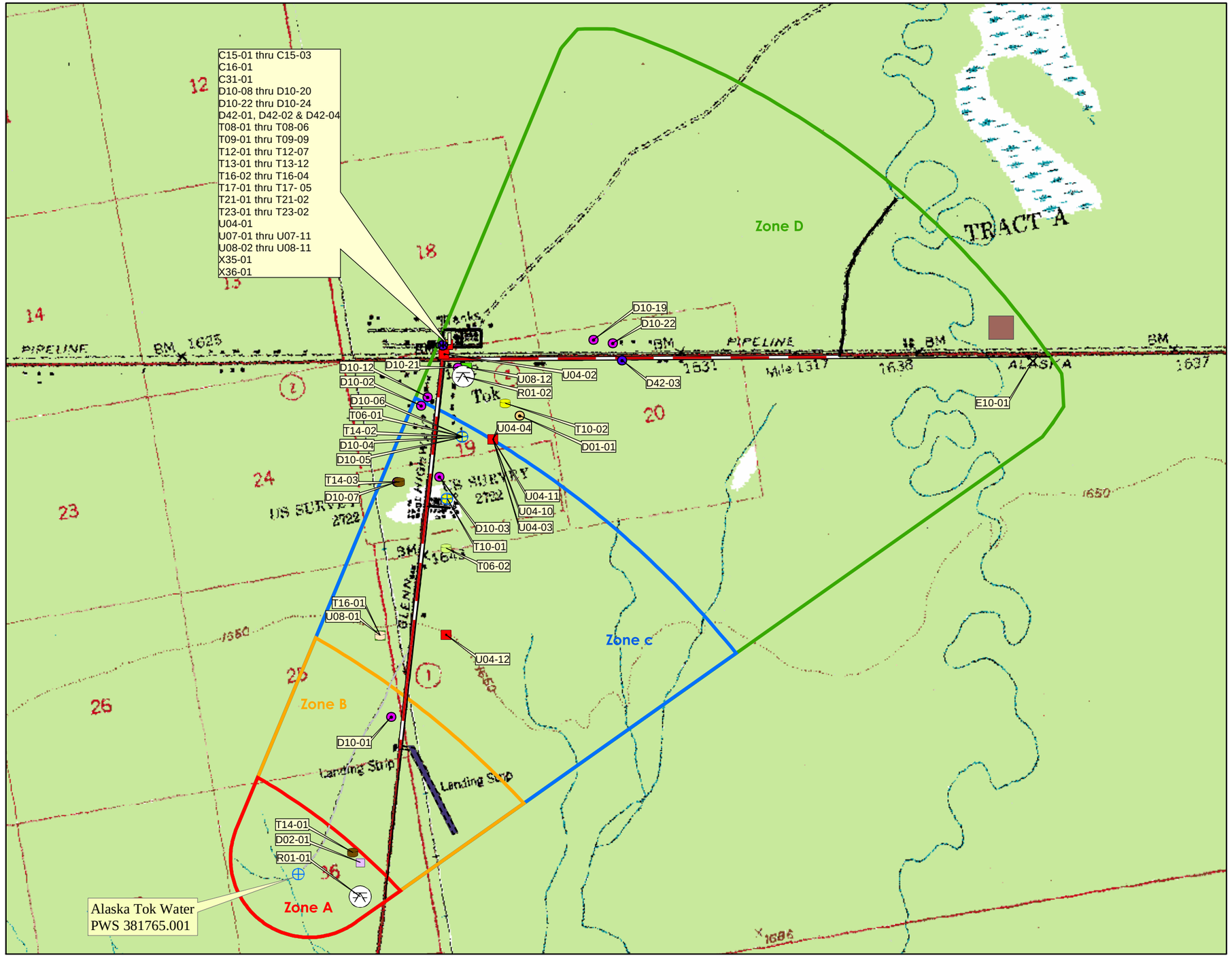
PWSID 381765.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Domestic wastewater treatment plant disposal ponds/lagoons	D02	D02-01	A	Low	C	
Residential Areas	R01	R01-01	A	Low	C	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	C	SOURDOUGH CAMPGROUND
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-04	C	Low	C	AT&T Alascom Tok Terminal Station, Reckey # 1997330114007, Status: Active DRO/RRO contaminated soil at the truck fill stand and DRO contaminated soil at the former 4,000 gallon AST site.
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-05	C	Low	C	GOLDEN BEAR MOTEL
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-06	C	Low	C	TOK-LODGE
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-07	C	Low	C	AKGATEWAY SD-TOK SCHOOL FLD
Contaminated sites, DEC recognized, non-Superfun non-RCRA	U04	U04-12	C	Low	C	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-01	C	Low	C	
Electric power generation (fossil fuels)	X36	X36-01	D	High	C	Tok Tesoro, Reckey #1991330931201, Status: Inactive, Leaking UST stor leaded, unleaded gas and/or diesel. Also surface spills from overflowing of bulk tanks.

APPENDIX C

Drinking Water Protection Area
and Potential and Existing Contaminant Sources
(Map C)

Public Water Well System for PWSID 381765.001 Alaska Tok Water
Showing Potential and Existing Sources of Contamination



0 0.25 0.5 1 1.5 2 Miles

LEGEND

Public Water System Well

Groundwater Protection Zones

- Zone A – 2 Months Travel Time
- Zone B – 2 Years Travel Time
- Zone C – 5 Years Travel Time
- Zone D – 10 Years Travel Time

Hydrography/Physical

- Parcels
- Stream
- Lake or Pond
- Contours

Transportation

- Primary Route (Class 1)
- Secondary Route (Class 2)
- Road (Class 3)
- Road (Class 4)
- Road (Class 5, Four-wheel drive)
- Road Ferry Crossing

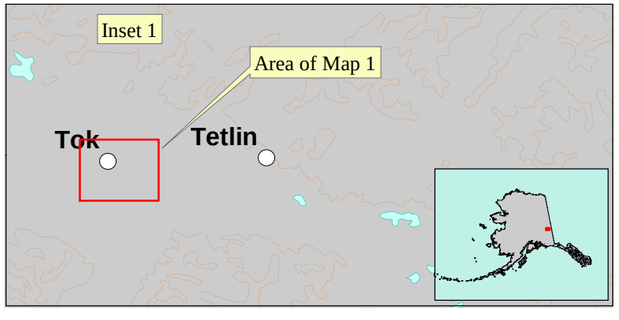
Existing or Potential Contaminant Sources

- Gasoline stations without repair shops (C15)
- Gasoline stations with repair shops (C16)
- Motor/motor vehicle repair shops (C31)
- Domestic wastewater collection system (sewer lines or lift stations) (D01)
- Injection wells (Class V) Large-Capacity Septic System (drainfield disposal method) (D10)
- Injection wells (Class V) motor vehicle waste disposal well (D42)
- Lawns and Gardens (R01)
- Tanks, diesel (aboveground) (T06)
- Tanks, diesel (underground) (T08)
- Closed tanks, diesel (underground) (T09)
- Tanks, gasoline (aboveground) (T10)
- Tanks, gasoline, (underground) (T12)
- Closed tanks, gasoline (underground) (T13)
- Tanks, heating oil, nonresidential (aboveground) (T14)
- Tanks, heating oil, nonresidential (underground) (T16)
- Closed tanks, heating oil, nonresidential (underground) (T17)
- Tanks, lubricants or other petroleum products (underground) (T21)
- Closed Wastewater Holding Tank (T23)
- Contaminated sites, DEC recognized, non-Superfund, non-RCRA
- Open Leaking Underground Fuel Storage Tank (LUST) (lubricants or petroleum products) (U07)
- Closed Leaking Underground Fuel Storage Tank (LUST) (lubricants or petroleum products) (U08)
- Campground or RV Park (X35)
- Electric Power Generation (fossil fuels) (X36)
- Domestic Wastewater Treatment Plant Disposal Lagoon (D02)
- Landfills (Municipal, Class III) (D51)
- Airport or landing strip (X14)

Data Sources:
- Contaminant Sources, Public Water System Wells, Contours Alaska Department of Environmental Conservation (ADEC)
- Critical Facilities, Federal Emergency Management Agency (FEMA)

All other data:
- United States Geological Survey (USGS)
- Drinking Water Protection Areas based on "Alaska Drinking Water Protection Program - Guidance Manual for Class A Public Water Systems" published by ADEC

URS Corporation does not guarantee the accuracy or validity of the data provided.



Alaska Tok Water
PWS 381765.001
Appendix C Map C

APPENDIX D

Vulnerability Analysis for Public Drinking Water Source (Charts 1-8)

Chart 1. Susceptibility of the wellhead - Alaska Tok Water (PWS No. 381765.001)

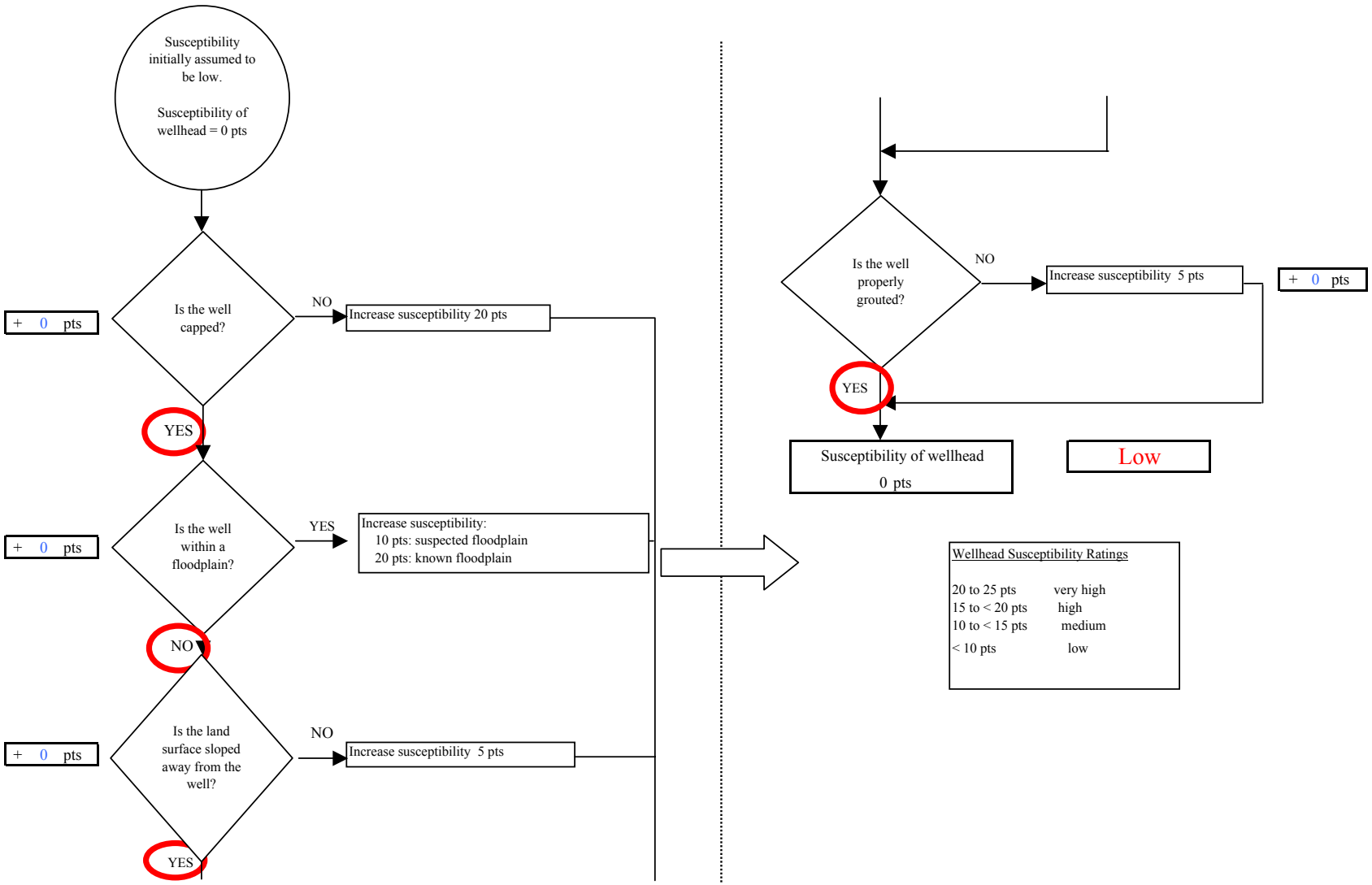


Chart 2. Susceptibility of the aquifer Alaska Tok Water (PWS No. 381765.001)

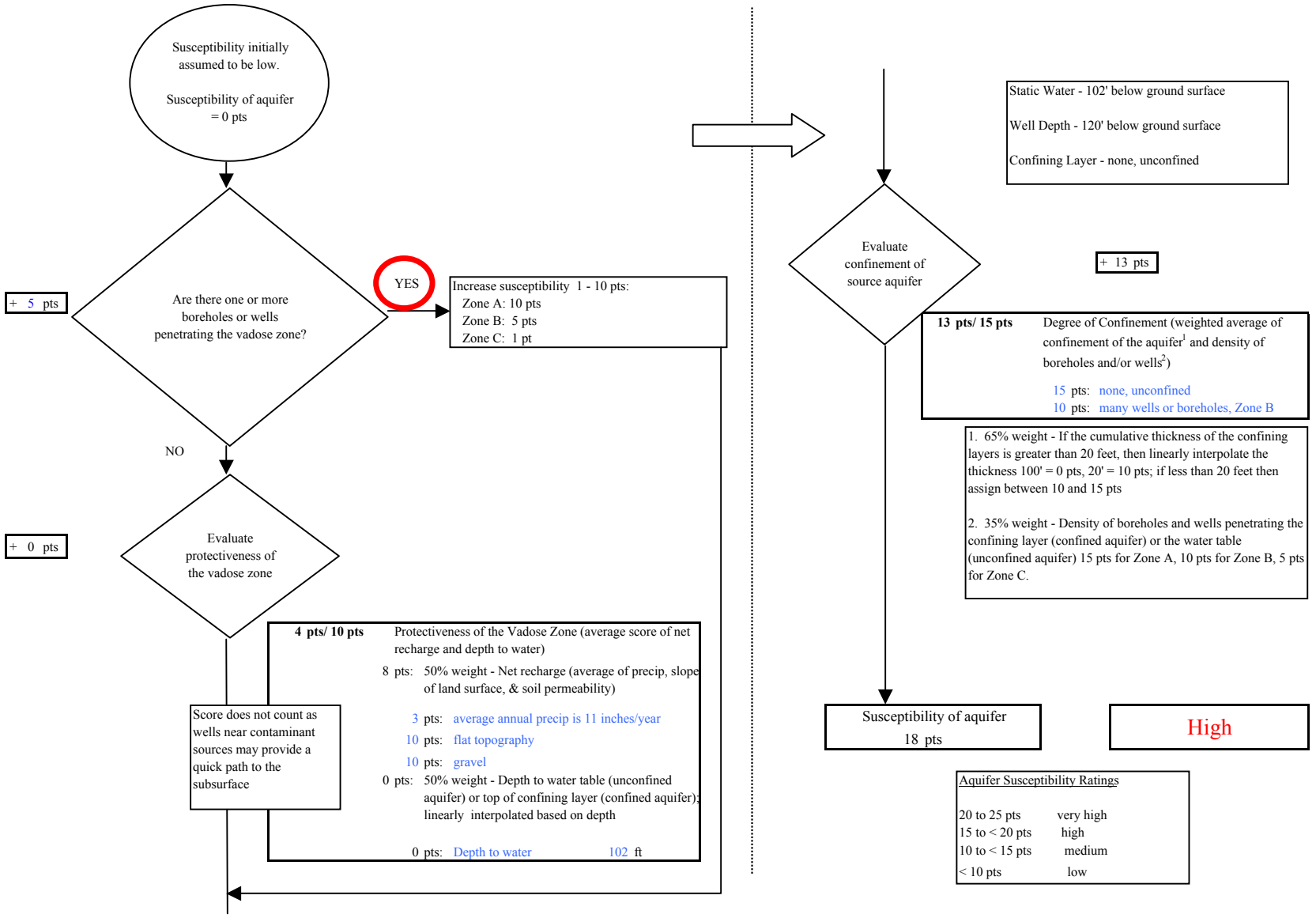
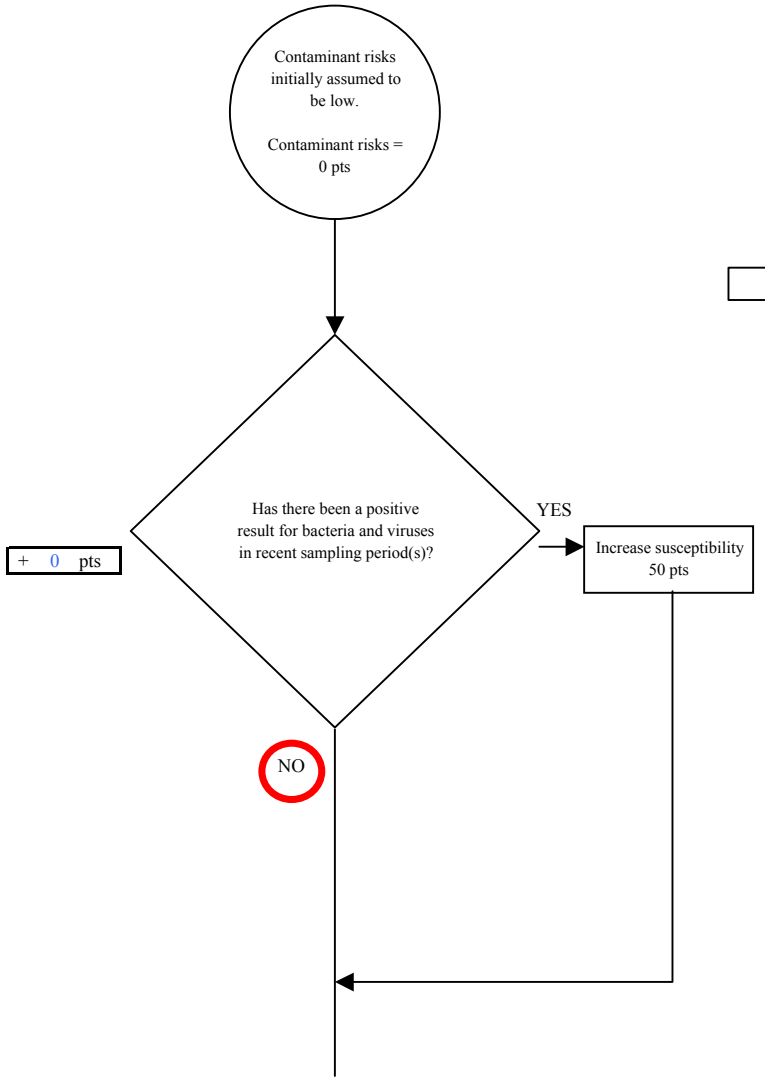
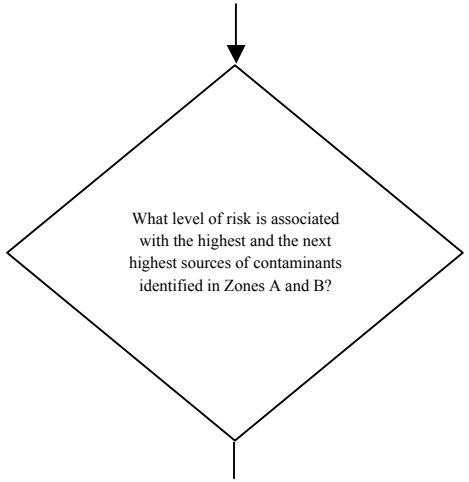


Chart 3. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Bacteria & Viruses





+ 40 pts

Risk Rankings for Contaminant Sources Identified in Zones A and B

	Zone A	Zone B	Total
Very Highs(s)	0	0	0
High(s)	1	1	2
Medium(s)	0	0	0
Low(s)	1	0	1

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

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 3. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Bacteria & Viruses

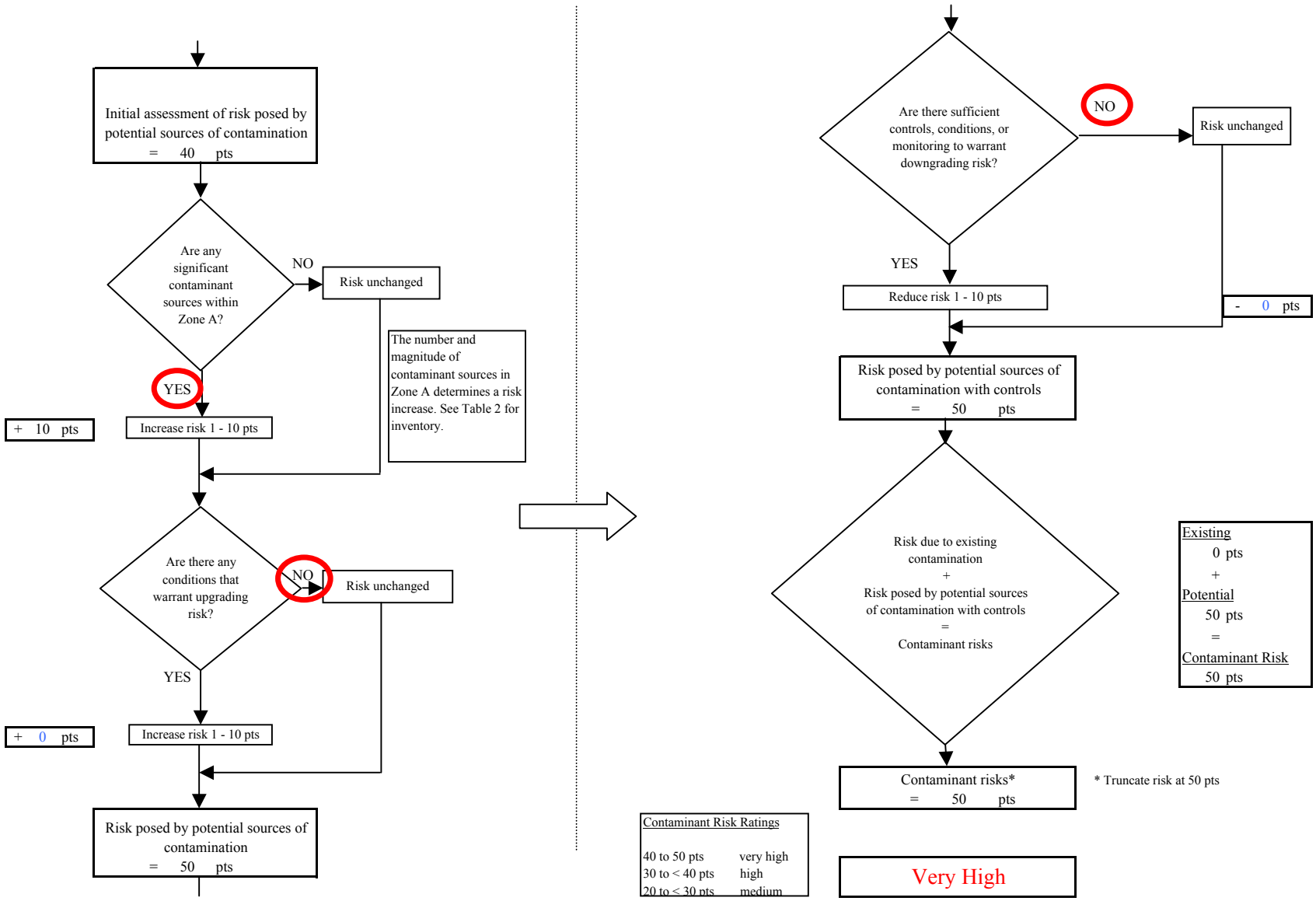


Chart 4. Vulnerability analysis for Alaska Tok Water (PWS No. 381765.001) - Bacteria & Viruses

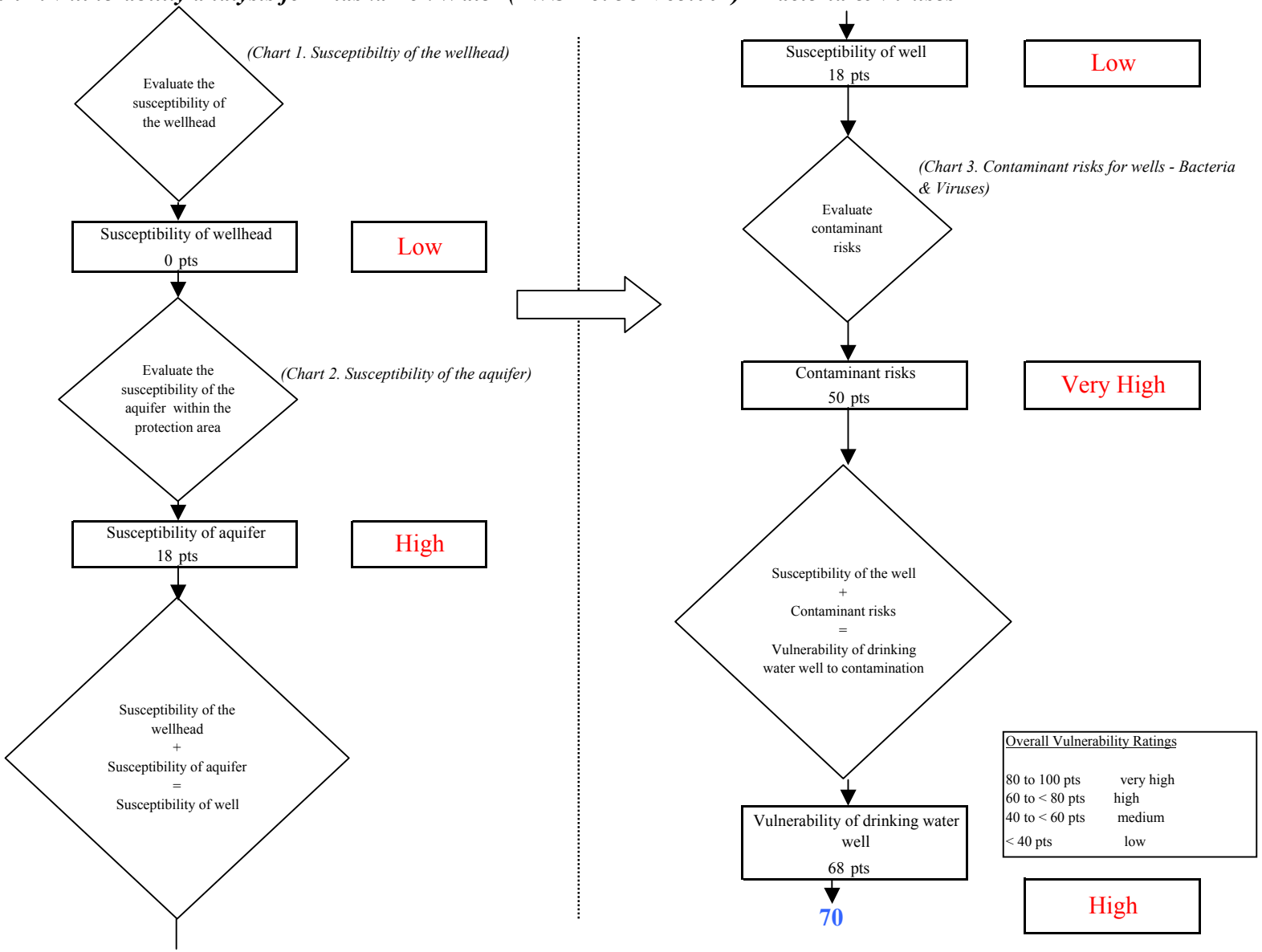


Chart 5. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Nitrates and Nitrites

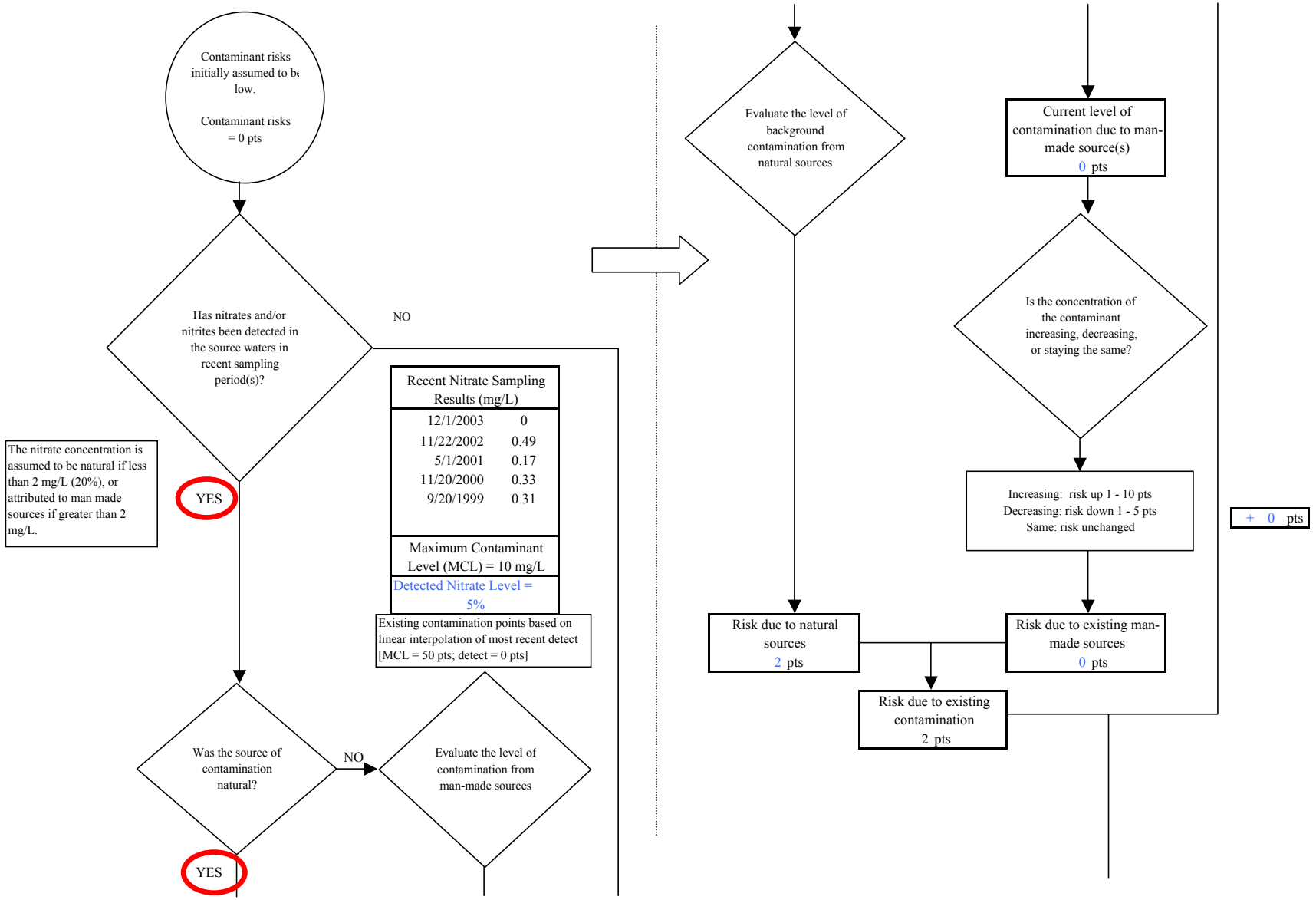


Chart 5. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Nitrates and Nitrites

+ 40 pts

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?

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

	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	1	7	8
Medium(s)	0	0	0
Low(s)	1	1	2

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 40

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individua 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.

Initial assessment of risk posed by potential sources of contamination = 40 pts

Is the source aquifer fractured rock or karst?

YES

NO

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

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 10 pts

The number and magnitude of contaminant sources in Zone A determines a risk increase. See Table 3 for inventory.

Chart 5. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Nitrates and Nitrites

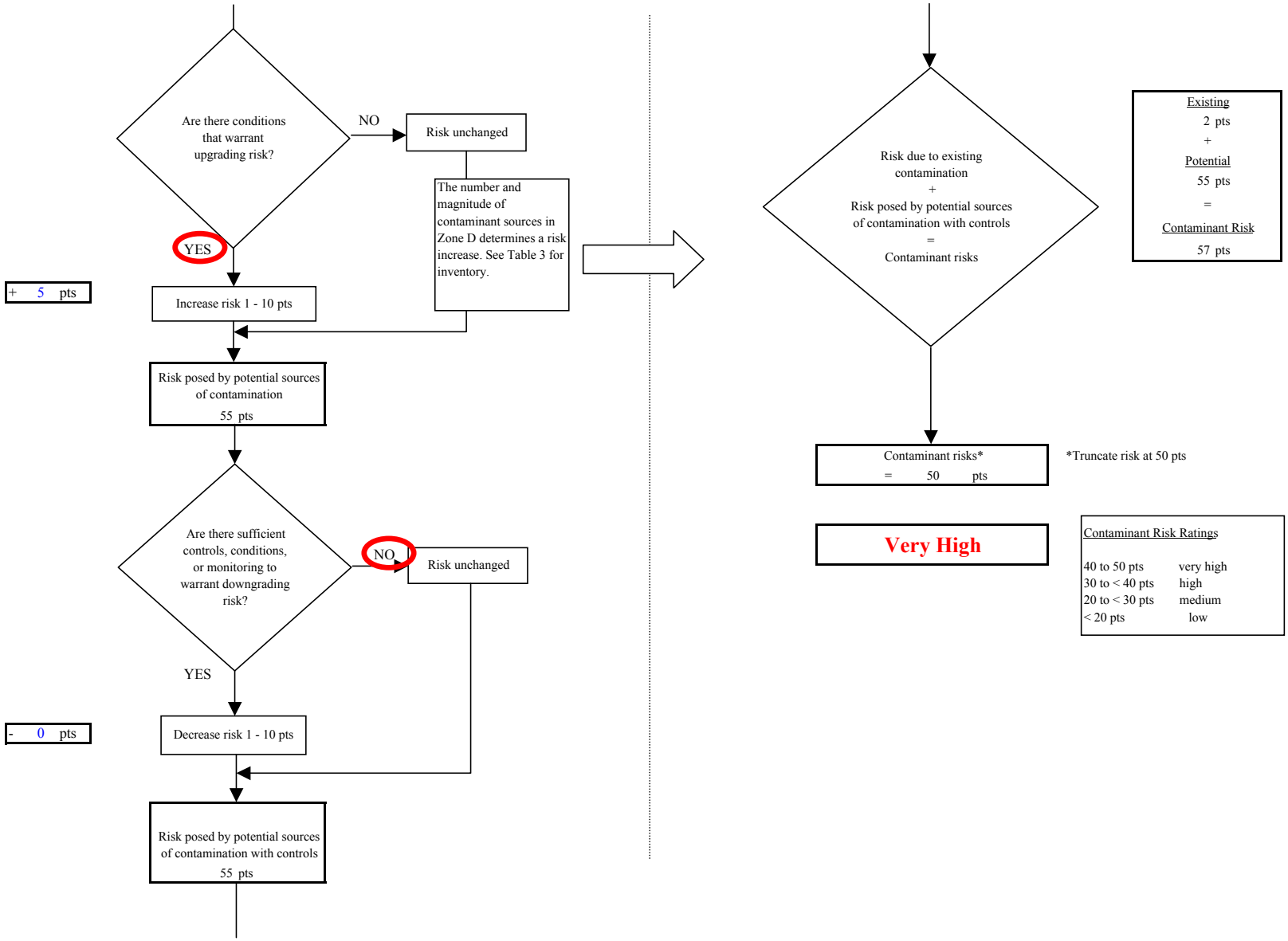


Chart 6. Vulnerability analysis for Alaska Tok Water (PWS No. 381765.001) - Nitrates and Nitrites

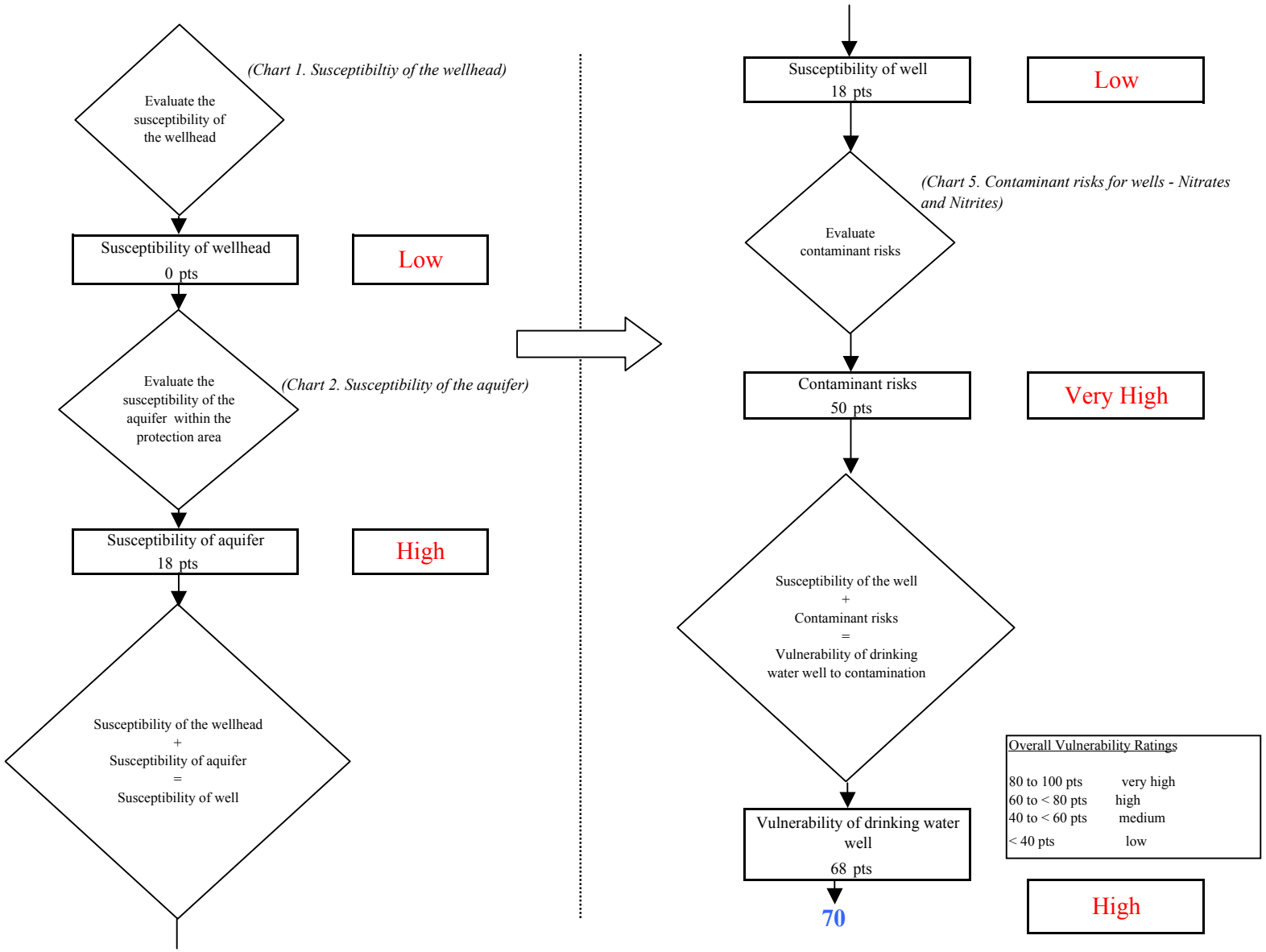


Chart 7. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Volatile Organic Chemicals

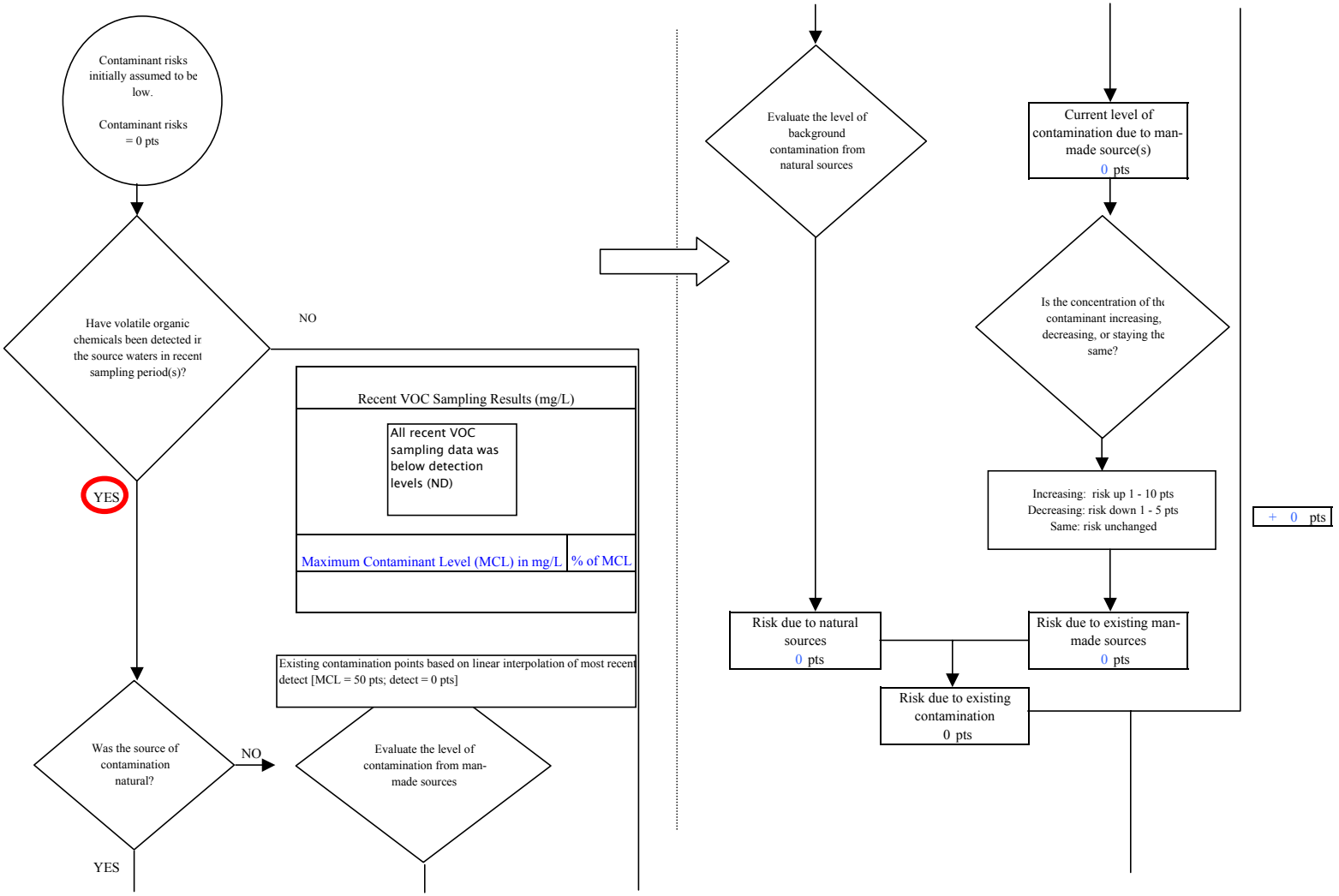
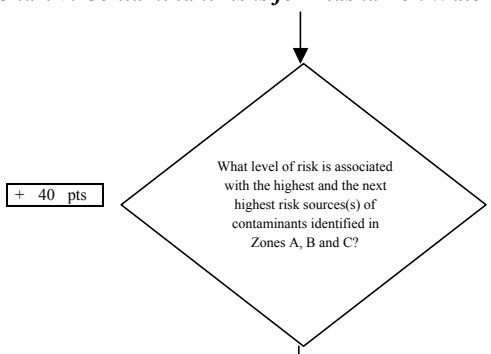


Chart 7. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Volatile Organic Chemicals



+ 40 pts

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

	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	2	2
Medium(s)	0	3	3
Low(s)	4	5	9

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 40

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in tl 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.

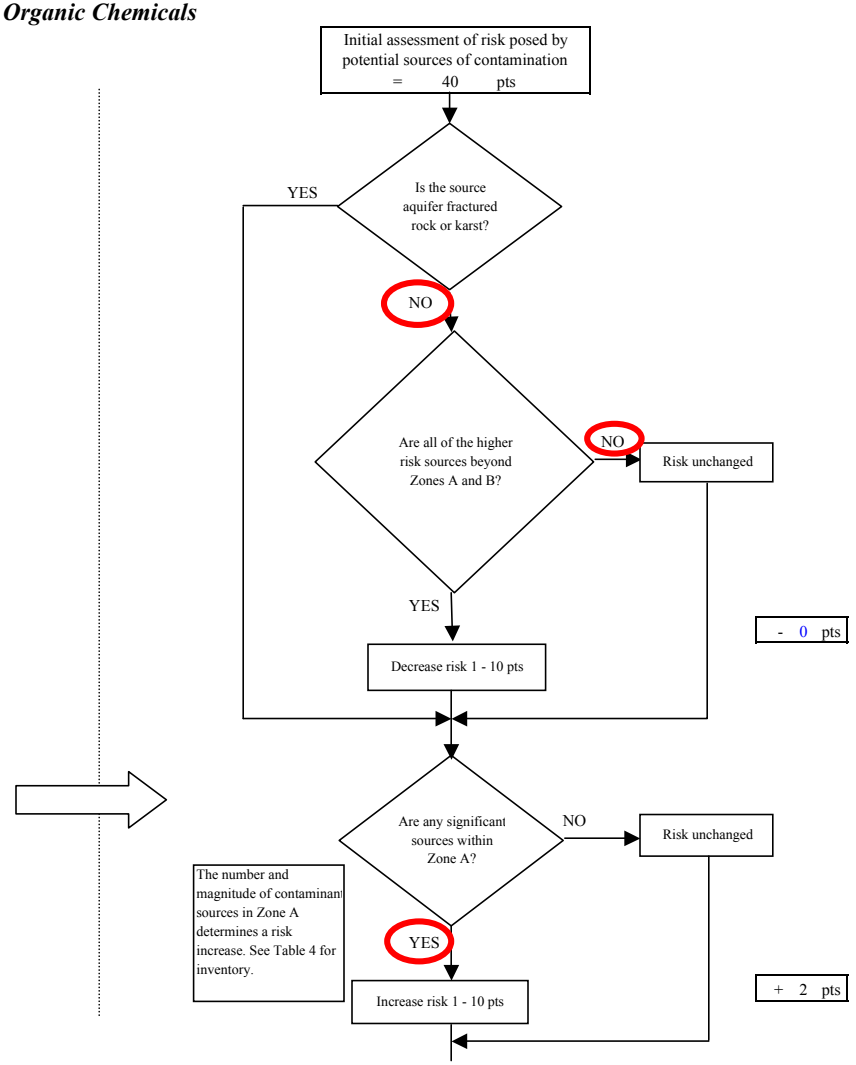


Chart 7. Contaminant risks for Alaska Tok Water (PWS No. 381765.001) - Volatile Organic Chemicals

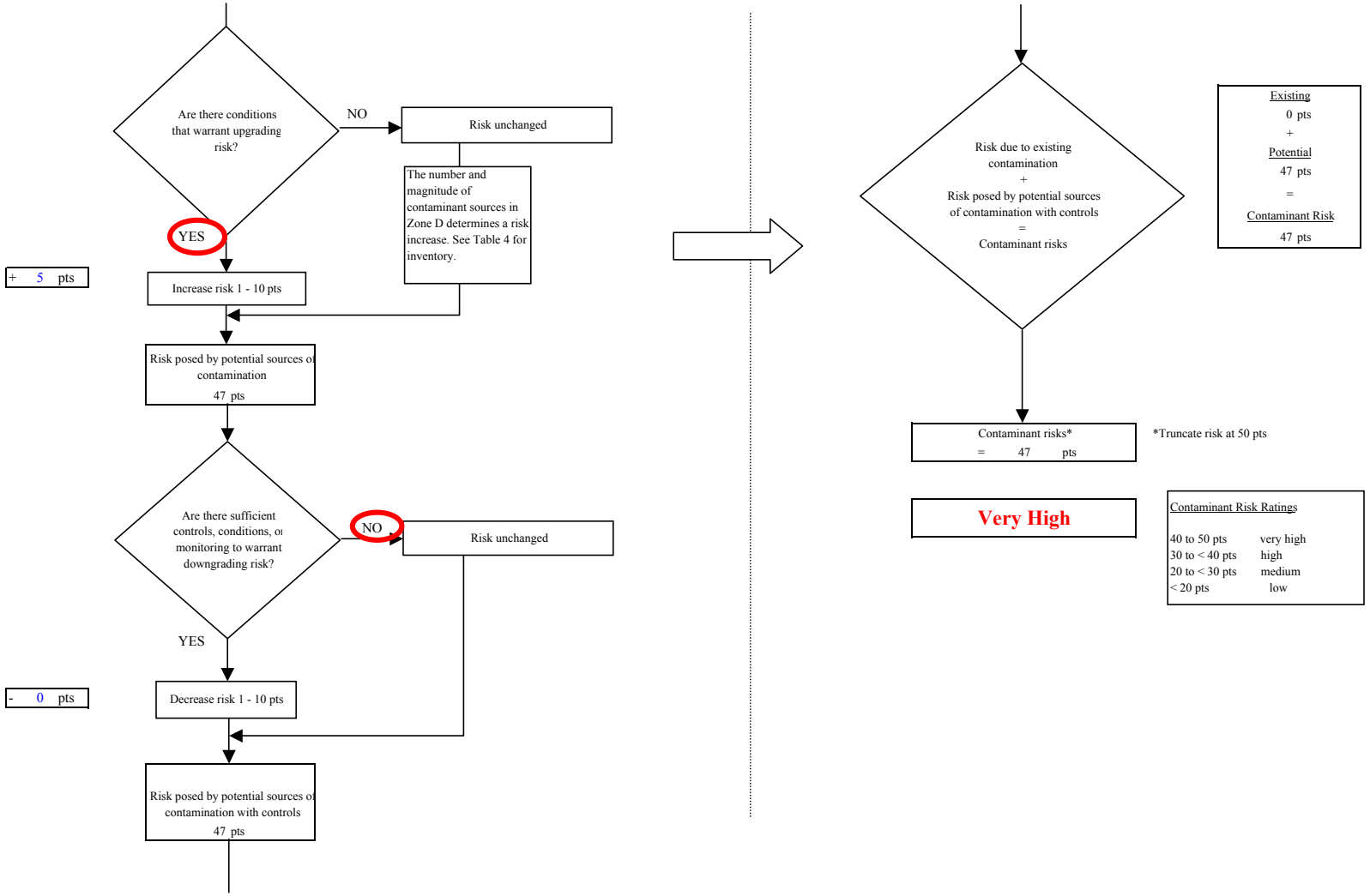


Chart 8. Vulnerability analysis for Alaska Tok Water (PWS No. 381765.001) - Volatile Organic Chemicals