Source Water Assessment

A Hydrogeologic Susceptibility and Vulnerability Assessment for Hilltop Truck Stop Drinking Water System,
Fairbanks area, Alaska
PWSID # 310358

September 2002

DRINKING WATER PROTECTION PROGRAM REPORT Report 684
Alaska Department of Environmental Conservation

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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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APPENDICES

Source Water Assessment for Hilltop Truck Stop Source of Public Drinking Water, Fairbanks Area, Alaska

Drinking Water Protection Program
Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

The public water system for Hilltop Truck Stop is a Class B (transient/non-community) water system consisting of one well on the Steese Highway approximately 20 miles northeast of Fairbanks, Alaska. The wellhead received a susceptibility rating of **Low** and the aquifer received a susceptibility rating of **Low**. Combining these two ratings produces a **Low** rating for the natural susceptibility of the well. Identified potential and current sources of contaminants for Hilltop Truck Stop public drinking water source include: a gasoline station, a large capacity septic system, inactive placer mines, fuel storage tanks, residential area, the Trans-Alaskan Pipeline, and a closed Leaking Underground Storage Tank (LUST) site. These identified potential and existing sources of contamination are considered as sources of bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals. Combining the natural susceptibility of the well with the contaminant risk, the public water sources for Hilltop Truck Stop received a vulnerability rating of **High** for bacteria and viruses, and a **Medium** for nitrates and/or nitrites and volatile organic chemicals.

HILLTOP TRUCK STOP PUBLIC DRINKING WATER SYSTEM

Hilltop Truck Stop public water system is a Class B (transient/non-community) water system. The system consists of one well on the west side of the Elliot Highway approximately 15 miles north of Fairbanks, Alaska (T1N, R1W, Section 2) (See Map 1 of Appendix A). Fairbanks and its surrounding communities are located in the Fairbanks North Star Borough which is near the center of Alaska (Please see the inset of Map 1 in Appendix A for location). The Borough's current population is 82,840 making it the second-largest population center in the state (ADCED, 2002). Communities located within the Borough include : College, Eielson Air Force Base, Ester, Fairbanks, Fox, Harding Lake, Moose Creek, North Pole, Pleasant Valley, Salcha, and Two Rivers.

The majority of residents the Fairbanks area have individual wells and septic systems, and the remainder haul water (ADCED, 2002). Heating oil (stored in both above and below ground 275 to 500-gallon tanks) is used for heating homes and buildings. Refuse is transported to the Fairbanks North Star Borough landfill.

The Fairbanks area includes two distinct topographic areas: the floodplain of the Tanana River and the Chena River, and the uplands north of this floodplain. This water system is located in the uplands at an elevation of approximately 1300 feet above sea level.

According to the well log for this water system, the depth of the well is 475 feet below the ground surface, and is screened in bedrock (schist). Bedrock in this area is predominantly a metamorphosed marine mud deposit, called a pelitic schist. The schist is locally intruded by granitic rocks – granite and quartz diorite. Groundwater in the bedrock is principally contained in fractures. The water wells in this area with the greatest well recharge appear to be in quartz veins, quartzite, and siliceous schist (Nelson, 1978).

Groundwater in the uplands is recharged by local precipitation. Outflow of ground water in the uplands primarily occurs two ways. In areas under artesian pressure (pressure caused by overlying permafrost), water can flow to the surface through thawed conduits within the permafrost. Otherwise groundwater will flow under the permafrost (if present) and out to the groundwater beneath the adjacent flood plain or creek valley (Nelson, 1978).

The Sanitary Survey (6/24//98) for the water system indicates the well site is not properly drained. Proper drainage on the surface helps prevent potential contaminants from travelling down the well casing. The well is grouted according to ADEC regulations. Proper grouting also provides added protection against contaminants travelling along the well casing and into source waters. A sanitary seal has been installed on the well.

This system operates year-round and serves approximately 1 resident and 50 non-residents through two service connections.

HILLTOP TRUCK STOP 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. 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 outline of the immediate watershed was used to determine the size and shape of the protection area for Hilltop Truck Stop. Available geology was also considered to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at a meaningful protection area (Please refer to the Guidance Manual for Class B Public Water Systems for additional information).

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. An analytical calculation was used to determine the size and shape of the protection area. The input parameters describing the attributes of the aquifer in this calculation were adopted from the U.S. Geological Survey (*Patrick, Brabets, and Glass, 1989*), and State of Alaska Department of Water Resources (*Jokela et. al., 1991*).

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 Hilltop Truck Stop is limited by its immediate watershed and includes only Zone A (See Map 1 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 Hilltop Truck Stop 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 2 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 HILLTOP TRUCK STOP 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 well for the Hilltop Truck Stop is completed in an unconfined aquifer. Because unconfined aquifers are recharged by surface water and precipitation that migrates downward from the surface, contaminants at the surface have the potential to adversely impact this aquifer. Table 2 shows the Susceptibility scores and ratings for Hilltop Truck Stop.

Table 2. Susceptibility

	Score	Rating
Susceptibility of the Wellhead	5	Low
Susceptibility of the Aquifer	9	Low
Natural Susceptibility	14	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	38	High
Volatile Organic Chemicals	40	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	65	High
Nitrates and Nitrites	50	Medium
Volatile Organic Chemicals	55	Medium

Bacteria and Viruses

The contaminant risk for bacteria and viruses is very high with the large capacity septic system representing the greatest risk to the drinking water well (See Chart 3 – Contaminant Risks for Bacteria and Viruses in Appendix D). Large capacity septic systems, designated a type of Class V Injection well by the Environmental Protection Agency (EPA), differ from residential septic systems in that they serve multiple dwellings, businesses, or communities.

Only a small amount of bacteria and viruses are required to endanger public health. Monitoring samples analyzed 8/15/00 were positive for bacteria and viruses (an additional sample collected on 8/17/00 confirmed the positive result). The positive samples increase the overall vulnerability of the drinking water souce, indicating that the source is susceptable to bacteria and viruses contamination. The source of the bacteria and viruses is unknown. More recent samples taken in 2001 and 2002 all had negative results for bacteria and viruses. 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 high with the large capacity septic system representing the risk to this source of public drinking water (See Chart 5 - Contaminant Risks for Nitrates and/or Nitrites in Appendix D).

Nitrates are very mobile, moving at approximately the same rate as water. Sampling history for the Hilltop Truck Stop well indicates that very low concentrations of nitrate have been detected in the drinking water. Existing nitrate concentration is approximately 0.52 mg/L or 5% of the Maximum Contaminant Level (MCL) of 10 mg/L. The MCL is the maximum level of contaminant that is allowed to exist in drinking water. Nitrated concentrations have remained consistent with concentrations varying from 0.21 to 0.52 mg/L within the past 5 years. After combining the contaminant risk for nitrates and nitrites with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

Volatile Organic Chemicals

The contaminant risk for volatile organic chemicals is very high with the gas station and the fuel storage tanks creating the greatest risk for volatile organic chemicals (See Chart 7 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).

Volatile Organic Chemicals were sampled for but not detected in 1993. 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 medium.

REFERENCES

Alaska Department of Community and Economic Development (ADCED), 2002 [WWW document]. URL http://www.dced.state.ak.us/mra/CF_BLOCK.cfm.

Forbes, R.B. and Weber, F.R., 1981. Bedrock Geologic Map of the Fairbanks Mining District, Alaska. Funded by the State of Alaska, US Geological Survey, and The National Science Foundation.

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

Jokela, J.B., Munter, J.A., and Evans, J.G., 1991, Ground-water resources of the Palmer-Big Lake area, Alaska: a conceptual model. Division of Geological &Geophysical Surveys Reports of Investigations 90-4, State of Alaska Department of Natural Resources, Fairbanks, AK.

King, P.B., compiler, 1969, Tectonic map of North America: US Geological Survey Map, (scale 1:5,000,000) 2 sheets.

Nelson, Gordon L., 1978, Hydrologic Information for Land-Use Planning, Fairbanks Vicinity, Alaska. US Department of the Interior Geological Survey Open File Report 78-959, 47p.

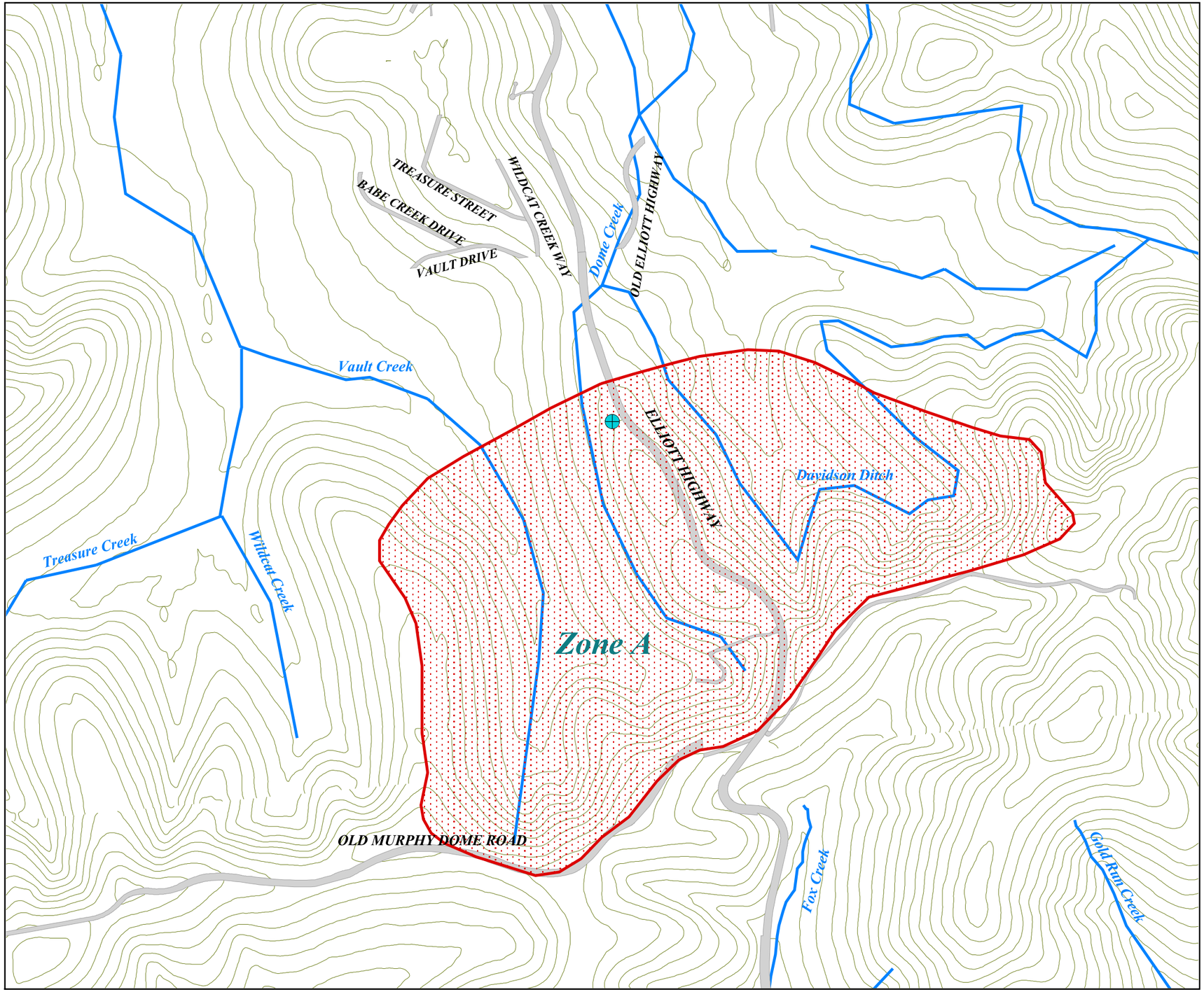
Patrick, L.D., Brabets, T.P., and Glass, R.L., 1989, Simulation of ground-water flow at Anchorage, Alaska: US Geological Survey Water-Resources Investigations Report 88-4139, 41p.

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

APPENDIX A

Hilltop Truck Stop
Drinking Water Protection Area Location Map
(Map 1)

Hilltop Truck Stop Drinking Water Protection Area

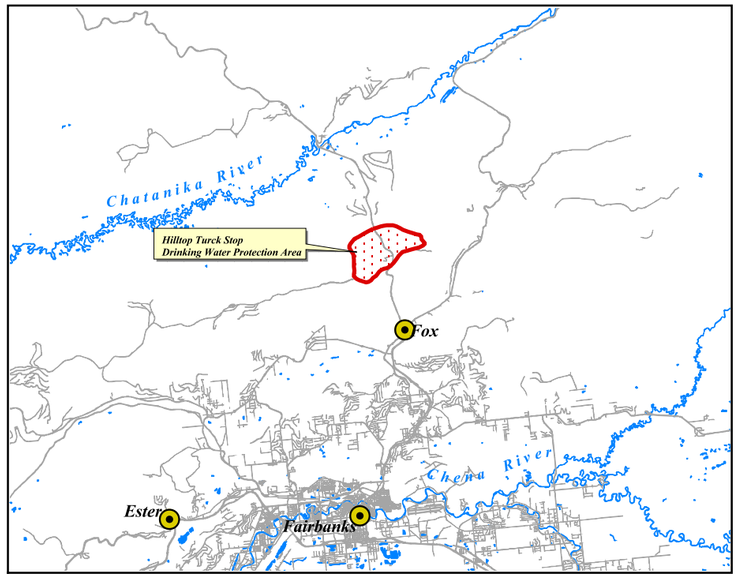


1 0 1 2 Miles

PWSID 310358.001

Legend

- Hilltop Truck Stop Well
- Zone A Protection Area
- Several Months Travel Time
- Roads
- Rivers and Streams
- Elevation Contours (20 meters)



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Map 1

APPENDIX B

Contaminant Source Inventory and Risk Ranking for Hilltop Truck Stop (Tables 1-4)

Table 1

Contaminant Source Inventory for ***Hilltop Truck Stop***

PWSID 310358.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-1	A	2	Hilltop Truck Stop
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	2	Hilltop Truck Stop septic system
Metals mining, placer (inactive)	E04	E04-1	A	2	Near Dome Creek
Metals mining, placer (inactive)	E04	E04-2	A	2	Near Davidson Ditch
Metals mining, placer (inactive)	E04	E04-3	A	2	Near Vault Creek
Residential Areas	R01	R01-1	A	2	Approximately 80 acres along the Elliot Highway
Tanks, diesel (underground)	T08	T08-1	A	2	Hilltop Truck Stop tank
Tanks, diesel (underground)	T08	T08-2	A	2	Hilltop Truck Stop tank
Tanks, diesel (underground)	T08	T08-3	A	2	Hilltop Truck Stop tank
Tanks, gasoline (underground)	T12	T12-1	A	2	Hilltop Truck Stop tank
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-1	A	2	Hilltop Truck Stop property
Highways and roads, paved (cement or asphalt)	X20	X20-1 - 2	A	2	Elliot Highway and Vault Drive
Pipelines (oil and gas)	X28	X28-1	A	2	Trans-Alaskan Pipeline

Table 2

Contaminant Source Inventory and Risk Ranking for Hilltop Truck Stop Sources of Bacteria and Viruses

PWSID 310358.001

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	D10-1	A	High	2	Hilltop Truck Stop septic system
Residential Areas	R01	R01-1	A	Low	2	Approximately 80 acres along the Elliot Highway
Highways and roads, paved (cement or asphalt)	X20	X20-1 - 2	A	Low	2	Elliot Highway and Vault Drive

Table 3

Contaminant Source Inventory and Risk Ranking for Hilltop Truck Stop Sources of Nitrates/Nitrites

PWSID 310358.001

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	D10-1	A	High	2	Hilltop Truck Stop septic system
Residential Areas	R01	R01-1	A	Low	2	Approximately 80 acres along the Elliot Highway
Highways and roads, paved (cement or asphalt)	X20	X20-1 - 2	A	Low	2	Elliot Highway and Vault Drive

Table 4

Contaminant Source Inventory and Risk Ranking for Hilltop Truck Stop Sources of Volatile Organic Chemicals

PWSID 310358.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-1	A	High	2	Hilltop Truck Stop
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	Low	2	Hilltop Truck Stop septic system
Residential Areas	R01	R01-1	A	Low	2	Approximately 80 acres along the Elliot Highway
Tanks, diesel (underground)	T08	T08-1	A	High	2	Hilltop Truck Stop tank
Tanks, diesel (underground)	T08	T08-2	A	High	2	Hilltop Truck Stop tank
Tanks, diesel (underground)	T08	T08-3	A	High	2	Hilltop Truck Stop tank
Tanks, gasoline (underground)	T12	T12-1	A	High	2	Hilltop Truck Stop tank
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U08-1	A	Low	2	Hilltop Truck Stop property
Highways and roads, paved (cement or asphalt)	X20	X20-1 - 2	A	Low	2	Elliot Highway and Vault Drive
Pipelines (oil and gas)	X28	X28-1	A	Medium	2	Trans-Alaskan Pipeline

APPENDIX C

Hilltop Truck Stop
Drinking Water Protection Area
and Potential and Existing Contaminant Sources
(Map 2)

Hilltop Truck Stop Drinking Water Protection Area with Potential & Existing Contaminant Sources

See inset

E04-1

R01-1

ELLIOTT HIGHWAY

Davidson Ditch

Dome Creek

Vault Creek

E04-2

X-28

SILVER FOX ROAD

E04-3

VAULT DRIVE

OLD MURPHY DOME ROAD

0.5 0 0.5 1 1.5 2 Miles

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Legend

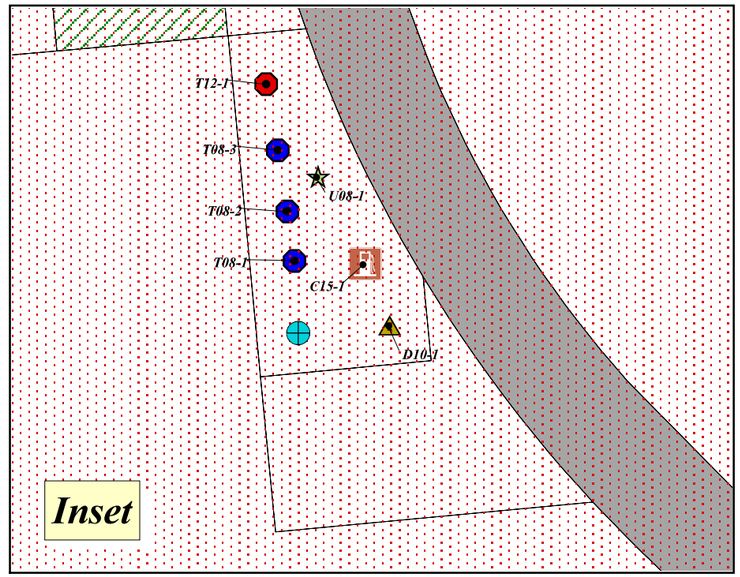
- Hilltop Truck Stop Well

Zone A Protection Area

- Several Months Travel Time
- Parcels
- Roads
- Rivers and Streams

Contaminant Sources

- Gasoline Station (without repair shop) (C15)
- Large Capacity Septic System (D10)
- Underground Diesel Tank (T08)
- Underground Gasoline Tank (T12)
- Closed Leaking Underground Storage Tank (LUST) Site (U8)
- Residential Area (R01)
- Inactive Placer Mines (E04)
- Trans-Alaskan Pipeline (X28)
- Elevation Contours (20 meters)



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Map 2

APPENDIX D

Vulnerability Analysis for Hilltop Truck Stop Public Drinking Water Source

(Charts 1-8)

Chart 1. Susceptibility of the wellhead - Hilltop Truck Stop

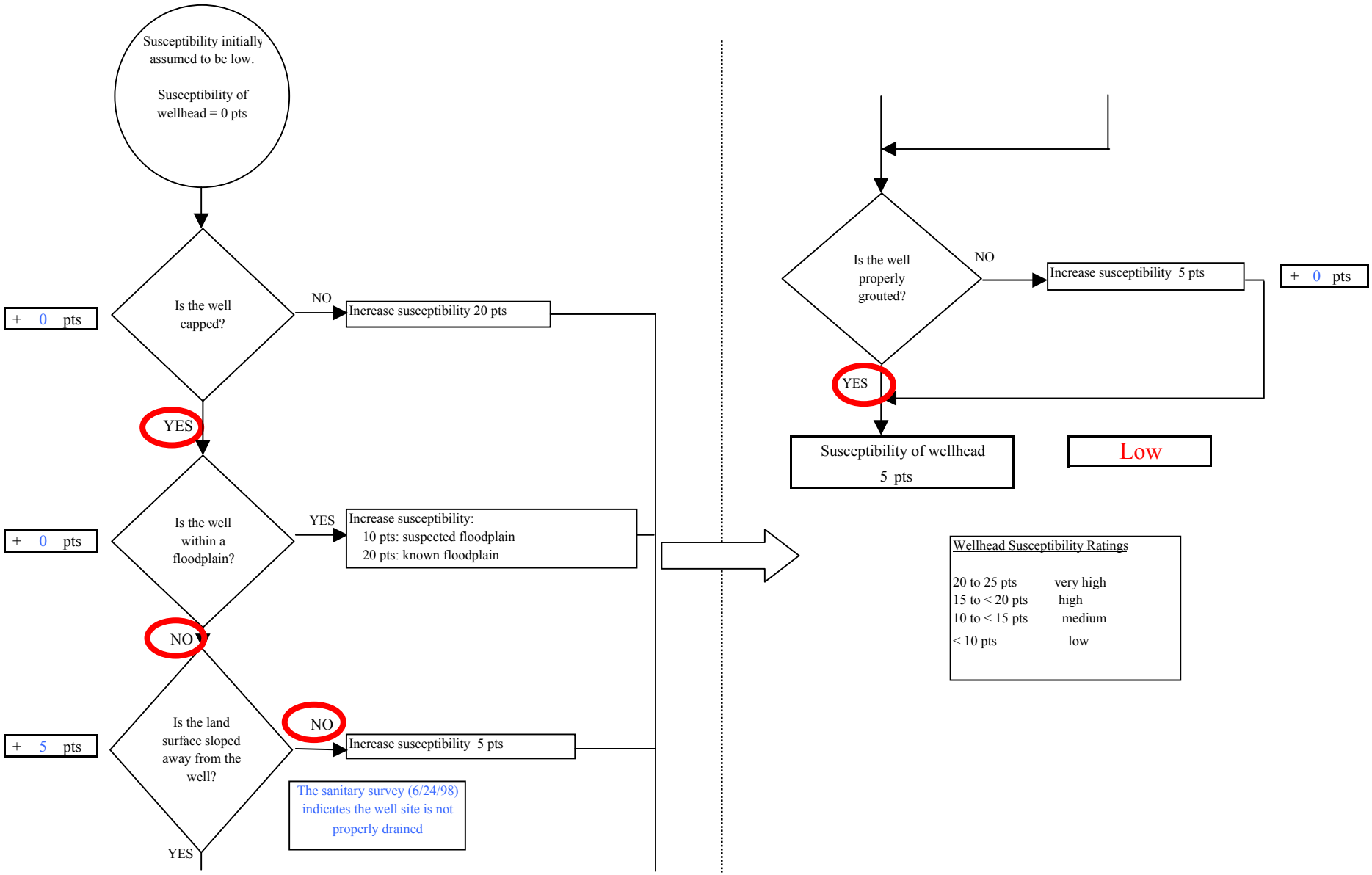


Chart 2. Susceptibility of the aquifer - Hilltop Truck Stop

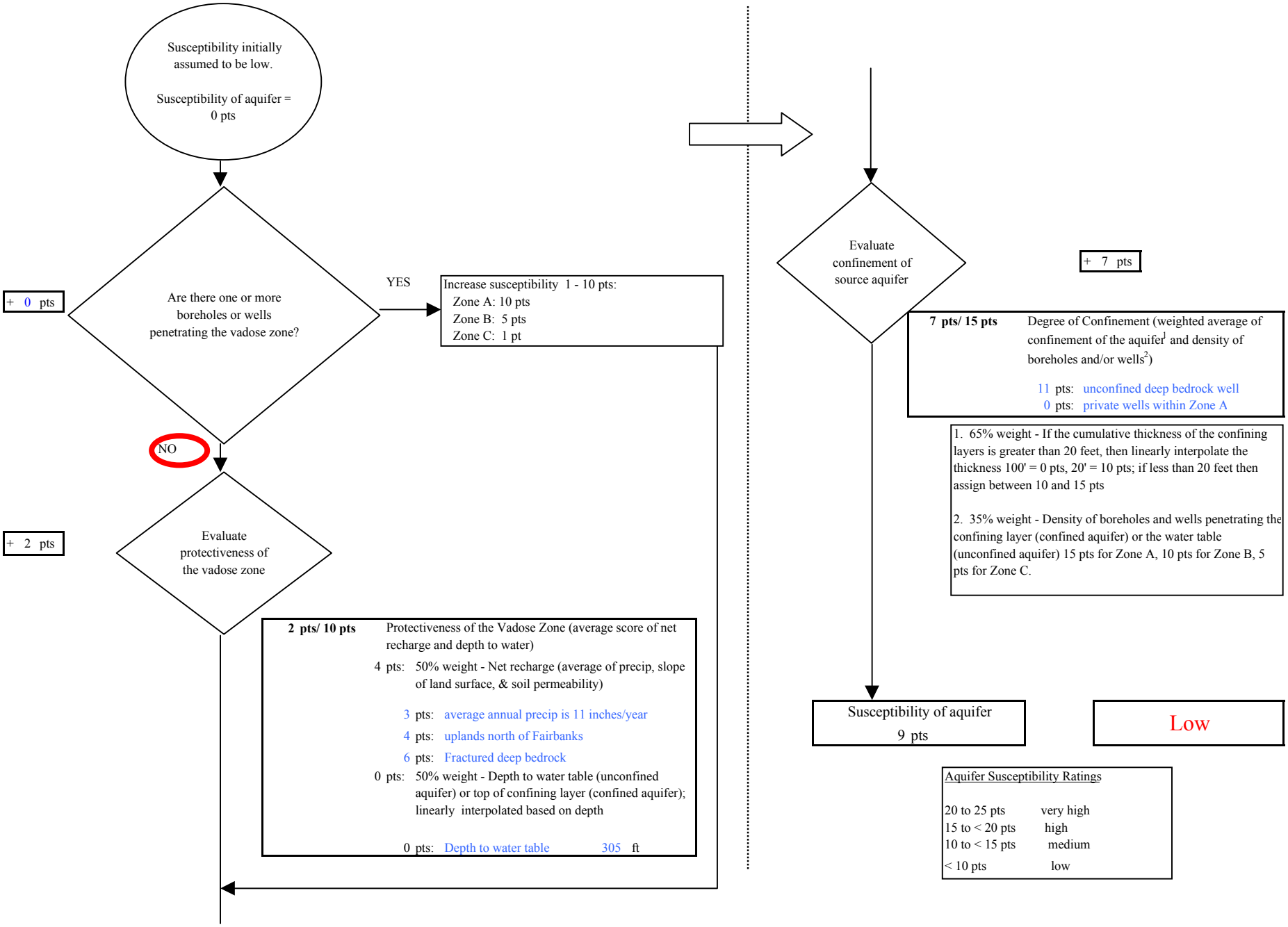
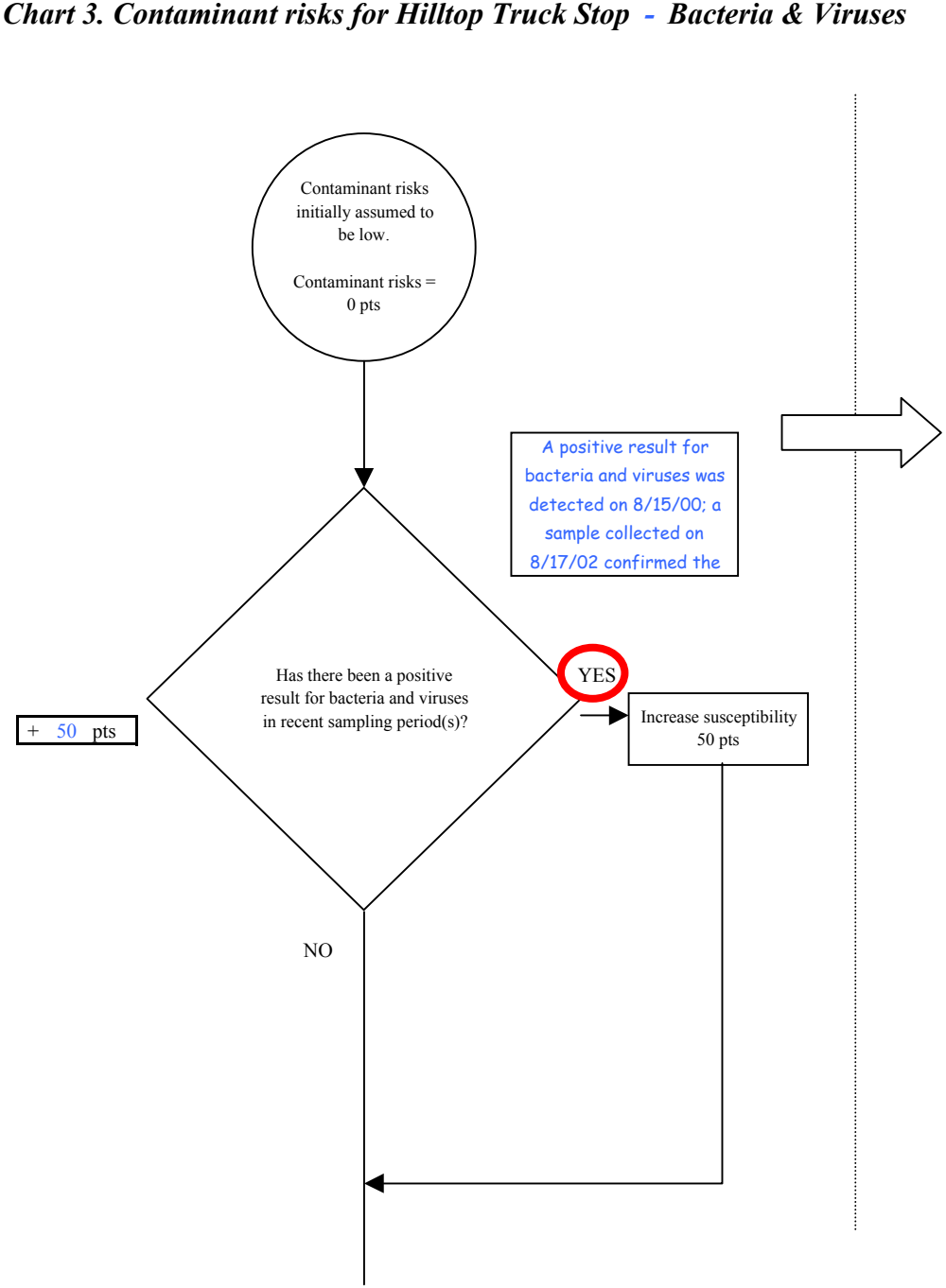
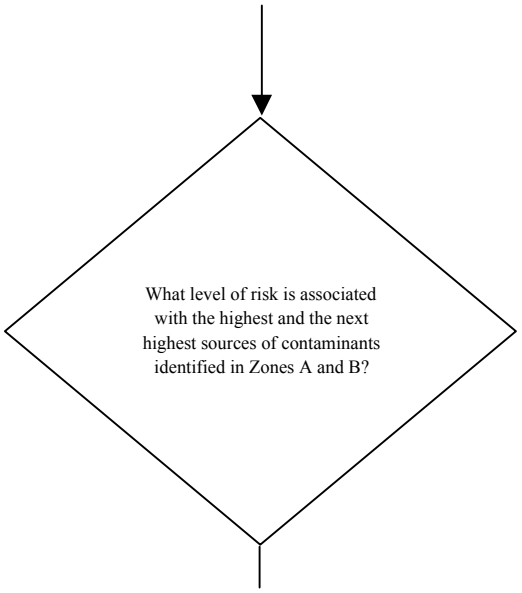


Chart 3. Contaminant risks for Hilltop Truck Stop - Bacteria & Viruses





+ 30 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	0	1
Medium(s)	0	0	0
Low(s)	3	0	3

	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 30

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 Hilltop Truck Stop - Bacteria & Viruses

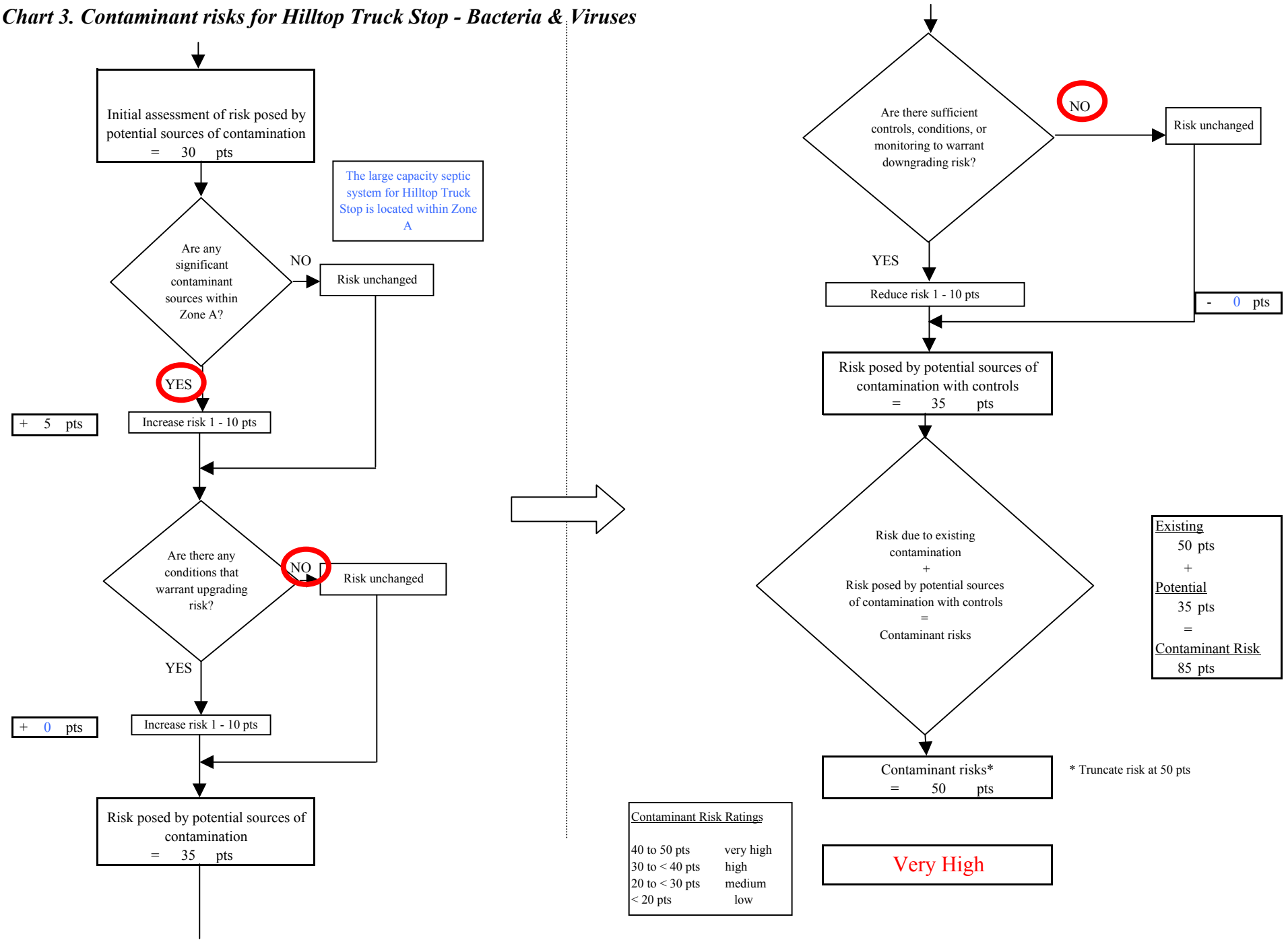


Chart 4. Vulnerability analysis for Hilltop Truck Stop - Bacteria & Viruses

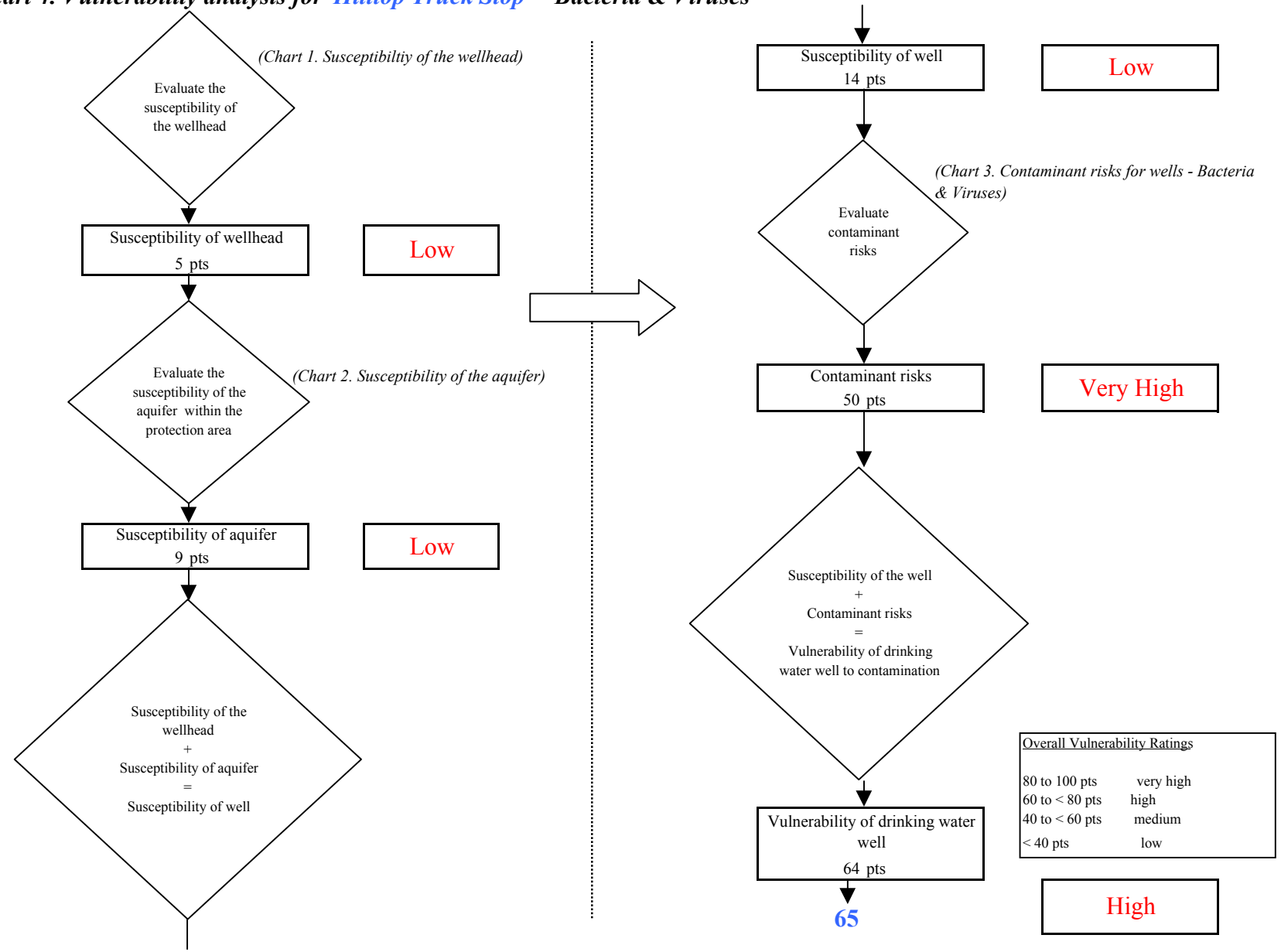


Chart 5. Contaminant risks for Hilltop Truck Stop - Nitrates and Nitrites

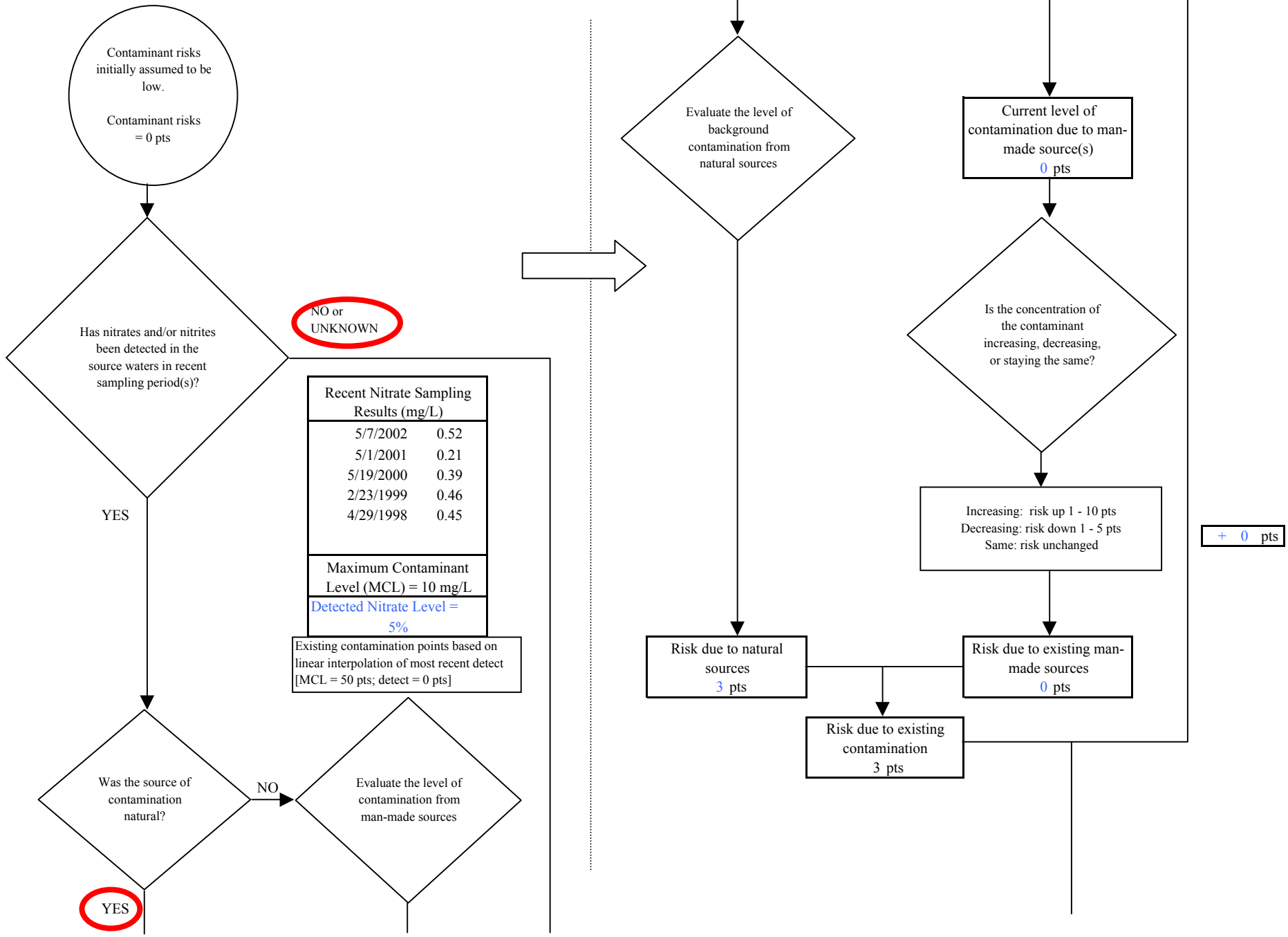
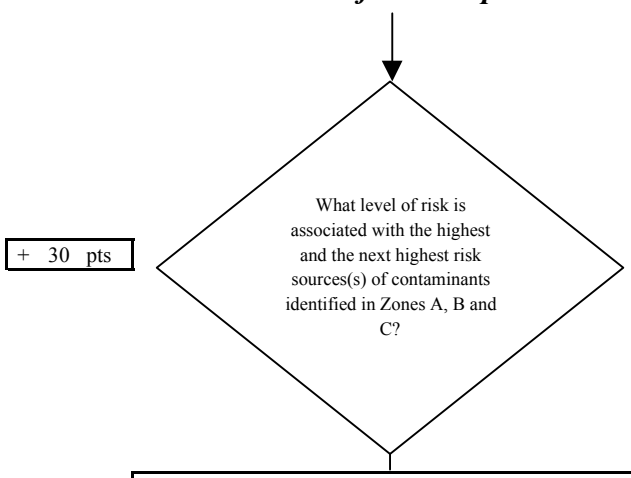


Chart 5. Contaminant risks for Hilltop Truck Stop - Nitrates and Nitrites



+ 30 pts

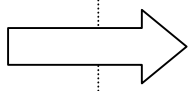
Risk Levels for Contaminant Sources identified in Zones A, B and C

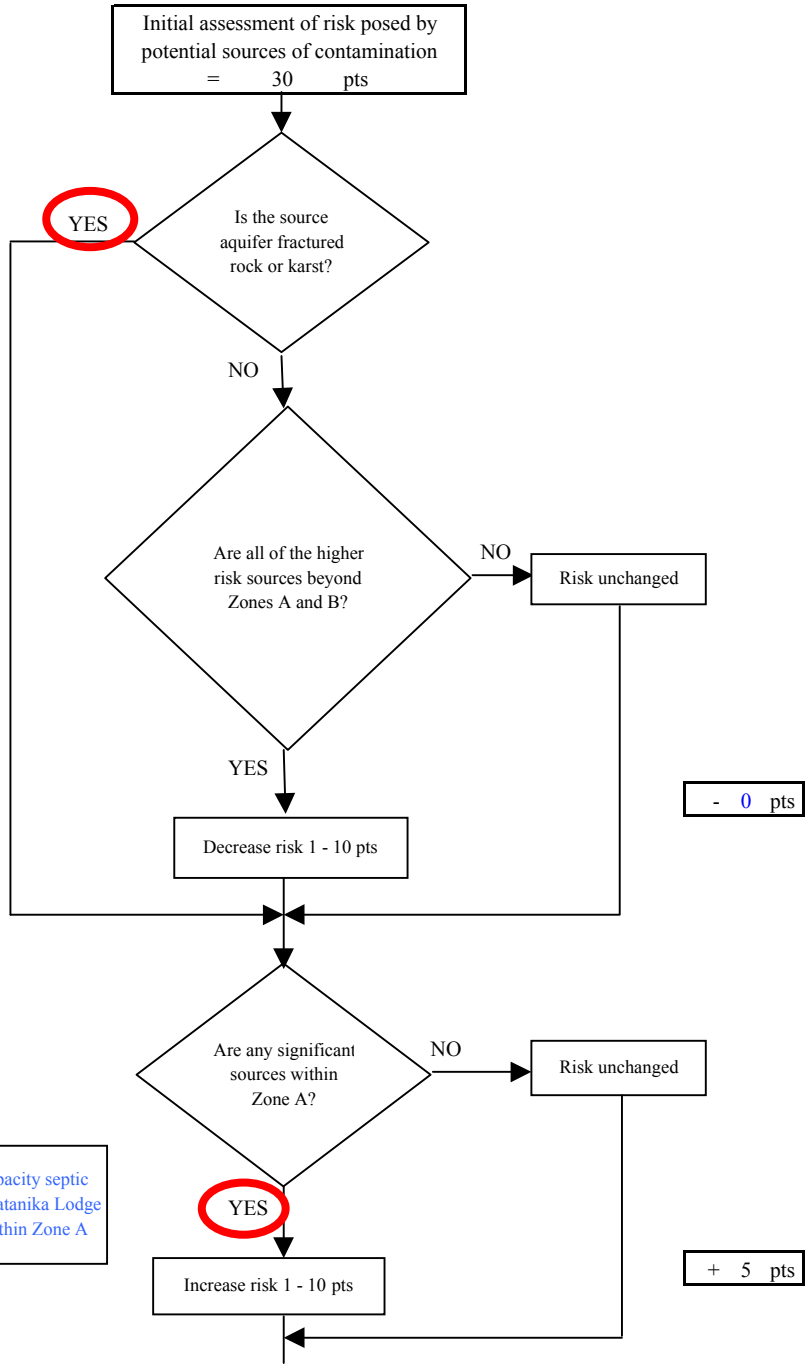
	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	1	0	1
Medium(s)	0	0	0
Low(s)	3	0	3

	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 30

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.





The large capacity septic system for Chatanika Lodge is located within Zone A

Chart 5. Contaminant risks for Hilltop Truck Stop - Nitrates and Nitrites

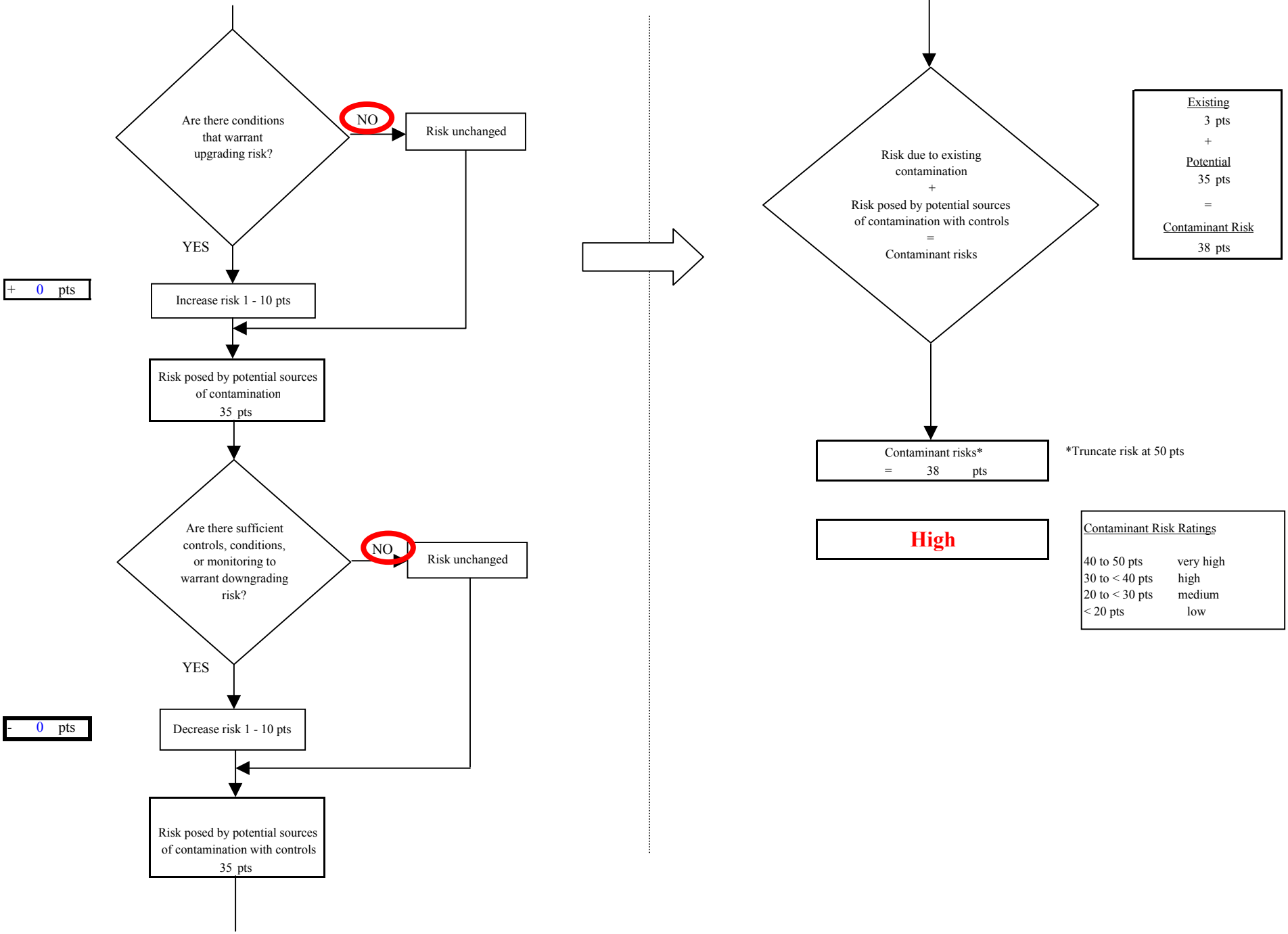


Chart 6. Vulnerability analysis for Hilltop Truck Stop - Nitrates and Nitrites

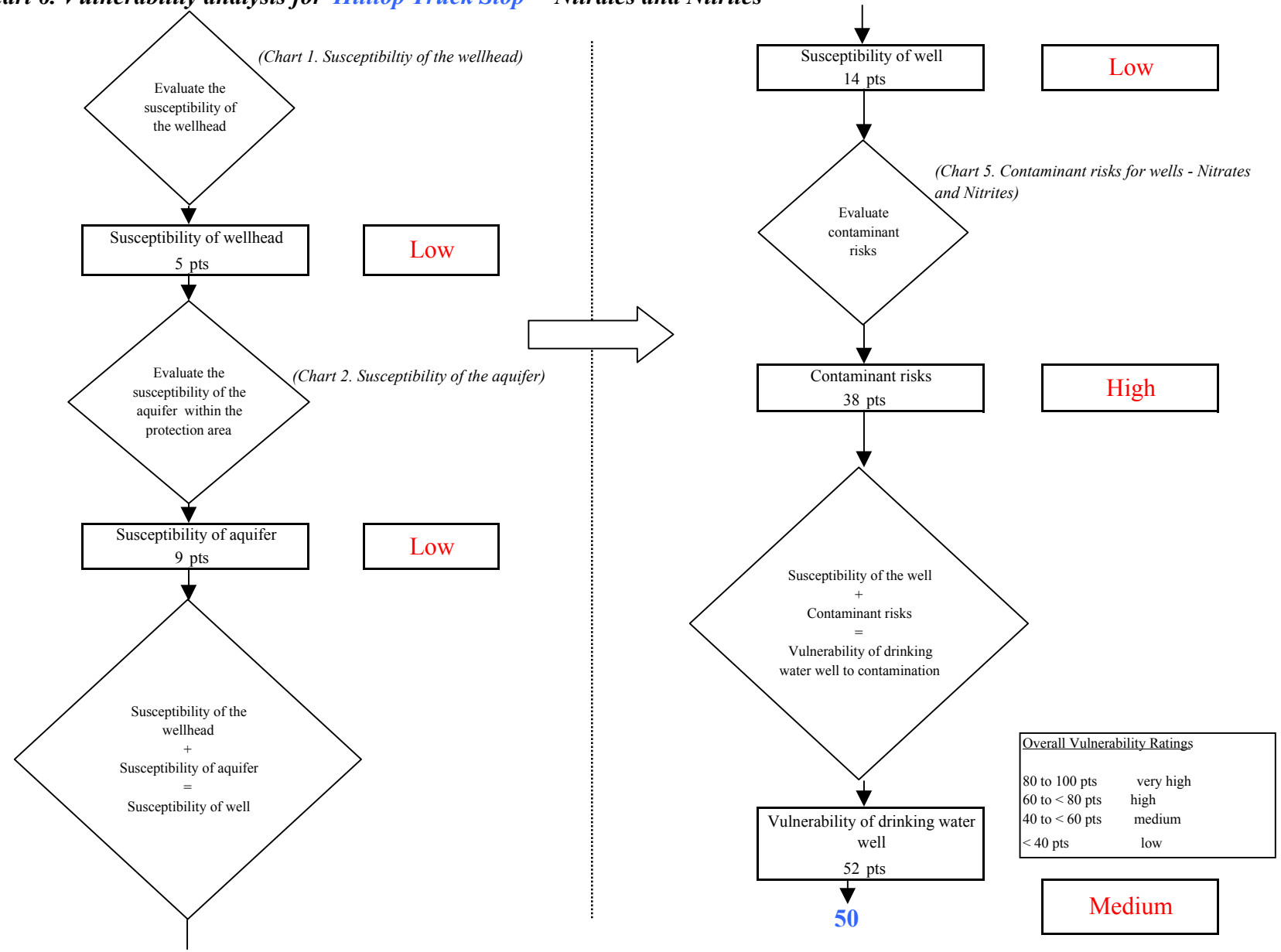


Chart 7. Contaminant risks for Hilltop Truck Stop - Volatile Organic Chemicals

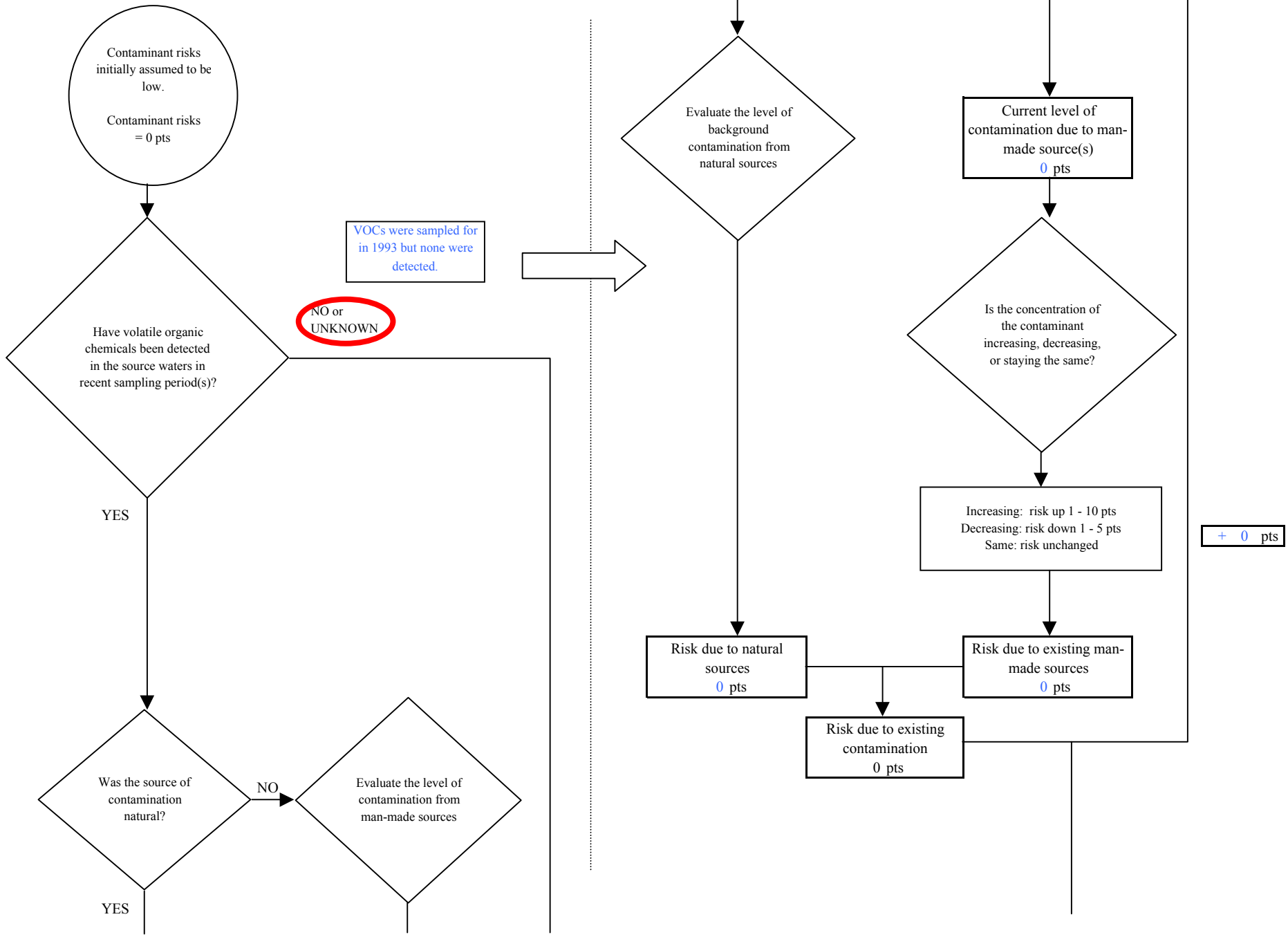


Chart 7. Contaminant risks for Hilltop Truck Stop - Volatile Organic Chemicals

+ 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)	5	0	5
Medium(s)	1	0	1
Low(s)	5	0	5

	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.

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

The fuel tanks for Hilltop Truck Stop are located within Zone A

YES → Increase risk 1 - 10 pts

+ 10 pts

Chart 7. Contaminant risks for Hilltop Truck Stop - Volatile Organic Chemicals

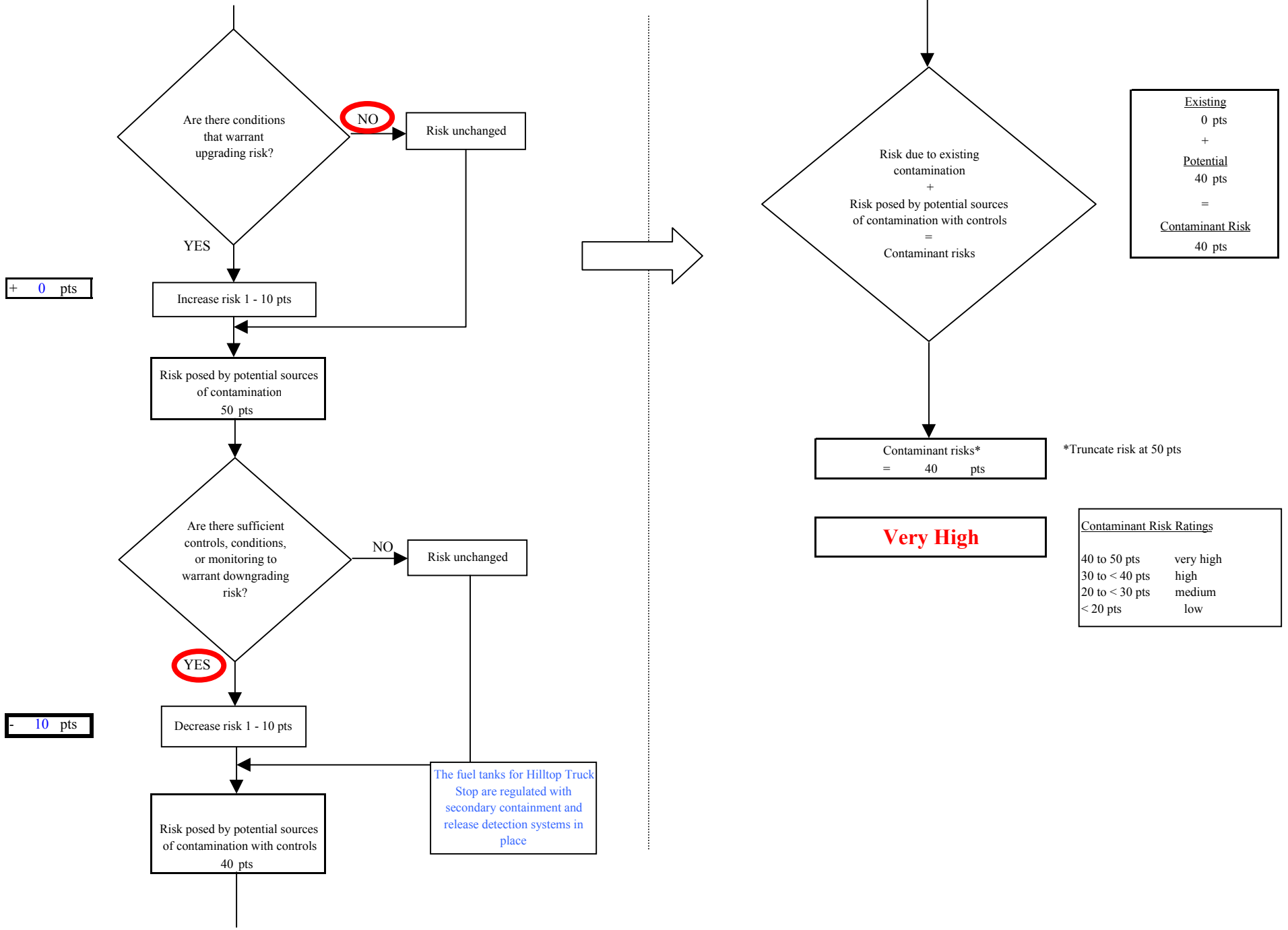


Chart 8. Vulnerability analysis for Hilltop Truck Stop - Volatile Organic Chemicals