DRINKING WATER PROTECTION PLAN FOR THE CITY OF LAVA HOT SPRINGS

PUBLIC WATER SYSTEM 6030030

Photo courtesy of Michelle Byrd, DEQ Pocatello

REVIEW AND UPDATE ANNUALLY

Date Reviewed	Reviewed By	Comments (attach additional document as needed)

Prepared by the Idaho Rural Water Association

TABLE OF CONTENTS

1.0 INTRODUCTION 4
1.1 Drinking Water System 4
1.2 Drinking Water Protection Steps 6
1.3 Drinking Water Protection and Source Water Assessment 6

2.0 COMMUNITY PLANNING TEAM 6
2.1 Duties of the Community Planning Team 7
2.2 Implementation Duties (Scope of Work) 7

3.0 DRINKING WATER PROTECTION AREA DELINEATION 7
3.1 Geology and Hydrogeology 8
3.2 Source Water Delineation 9

4.0 POTENTIAL SOURCES OF GROUND WATER CONTAMINATION 9
4.1 Point Sources 10
4.2 Nonpoint Sources 11

5.0 DRINKING WATER PROTECTION MANAGEMENT APPROACHES 12
5.1 Regulatory Approaches 12
5.2 Non-regulatory Approaches 12
5.2.1 Public Education 12
5.2.2 Pollution Prevention 12
5.2.3 Groundwater Guardian Community Membership 13
5.2.4 Home*A*Syst and Farm*A*Syst 13
5.2.5 Best Management Practices 14
5.2.6 Household Hazardous Waste Collection 14
5.2.7 Water Conservation 14
5.2.8 Water Quality Data Reviews 14

6.0 MANAGEMENT TOOLS AND PROTECTION MEASURES FOR POTENTIAL CONTAMINANT SOURCES 15
6.1 Management Tools 15

7.0 CONTINGENCY PLAN 15
7.1 Emergency Spill Response 15

8.0 PROTECTION STRATEGIES FOR NEW DRINKING WATER SOURCES 15
8.1 Encroachment 16

9.0 IMPLEMENTATION STRATEGY 16
9.1 Planning for the Future. 17
9.2 Community Planning Team 18
9.3 Source Water Delineation 18
9.4 Potential Contaminant Source Inventory 18
9.5 Contaminant Management Practices 18
9.5.1 Regulatory Approaches 18
9.5.2 Non-regulatory Approaches 20
9.6 Additional Implementation Considerations 20

10.0 SECURITY VULNERABILITY SELF-ASSESSMENT GUIDE FOR SMALL DRINKING WATER SYSTEMS 20

11.0 PUBLIC PARTICIPATION 21

12.0 REFERENCES 21

TABLE OF CONTENTS

APPENDIX A - SOURCE WATER DELINEATIONS....24
APPENDIX B - WELL DOCUMENTATION....28
APPENDIX C - OVERVIEW OF POTENTIAL CONTAMINANT SOURCES (GROUND AND SURFACE WATER)....33
APPENDIX D - DRINKING WATER PROTECTION ORDINANCE TEMPLATE (EXAMPLE)....39
APPENDIX E - CONTINGENCY PLAN....46
APPENDIX F - IDAHO EMERGENCY RESPONSE FLOW CHART....54
APPENDIX G - DRINKING WATER PROTECTION PLAN CERTIFICATION CHECKLIST....56
APPENDIX H - GLOSSARY....58

LIST OF FIGURES

FIGURE A1. GEOGRAPHIC LOCATION OF THE CITY OF LAVA HOT SPRINGS....25
FIGURE A2. WELL #1 FISH CREEK SOURCE WATER DELINEATION....26
FIGURE A3. WELL #2 W SOURCE WATER DELINEATION....27
FIGURE B1. WELL DOCUMENTATION - WELL #1 FISH CREEK....29
FIGURE B2. WELL DOCUMENTATION - WELL #2 W....30
FIGURE B3. WELL DOCUMENTATION - WELL #2 W (CONTINUED)....31
FIGURE B4. WELL DOCUMENTATION - WELL #2 W (CONTINUED)....32
FIGURE E1. EMERGENCY ACTION GUIDE....53
FIGURE F1. IDAHO EMERGENCY RESPONSE FLOW CHART....55

LIST OF TABLES

TABLE 1. CITY OF LAVA HOT SPRINGS DRINKING WATER PROTECTION COMMUNITY PLANNING TEAM....6
TABLE 2. WELL #1 FISH CREEK POTENTIAL CONTAMINANT SOURCE INVENTORY....10
TABLE 3. WELL #2 W POTENTIAL CONTAMINANT SOURCE INVENTORY....10
TABLE 4. IMPLEMENTATION SCHEDULE....17
TABLE C1. POTENTIAL CONTAMINANT SOURCES (GROUND AND SURFACE WATER)....34
TABLE E1. THREATS/HAZARDS CONSIDERED....47
TABLE E2. WATER SYSTEM CHARACTERISTICS....48
TABLE E3. WATER SYSTEM SOURCE CHARACTERISTICS....48
TABLE E4. WATER RESTRICTIONS AND PRIORITY USE DURING EMERGENCY CONDITIONS....49
TABLE E5. LOCAL INCIDENT ASSESSMENT TEAM....51

1.0 INTRODUCTION

Drinking Water Protection, which is essentially the same as Wellhead Protection for ground water systems, is a voluntary program implemented at the local level *(*Note 1*). The City of Lava Hot Springs has developed this Drinking Water Protection Plan to outline the process that will be used to help prevent contamination of ground water that supplies the City of Lava Hot Springs' drinking water. Because the City of Lava Hot Springs uses ground water for 100 percent of its drinking water supply, protection of this resource is critical to the health and welfare of the community. Drinking water protection will help protect this resource from ground water contamination by monitoring land use that occurs within the area overlying the aquifer from which the wells draw water.

**Note 1. The term "Drinking Water Protection" is the same as Wellhead Protection for ground water sources of drinking water and Source Water Protection for ground water and surface water sources. The term "Drinking Water Protection" will be used throughout this Plan and is synonymous with Source Water/Wellhead Protection.*

Many materials such as pesticides, fertilizers, organic chemicals, and human and animal wastes can contaminate ground water. The degree of contamination depends on many factors including soil characteristics, volume of contaminant, contaminant properties, climate and ground water flow. Once ground water becomes contaminated, it is often difficult and expensive to clean up. A public water system that is supplied by an aquifer that has become contaminated may be required to do additional monitoring and may need to install water treatment equipment or find a new source of drinking water. The most cost-effective approach is to prevent contamination before it occurs, rather than attempting to remedy contamination problems after they have occurred.

1.1 Drinking Water System

The City of Lava Hot Springs' drinking water system currently consists of two ground water wells (hereafter referred to as "Well #1 Fish Creek" and "Well #2 W"), and eleven springs. At the time this Plan was developed, the source water assessment for the springs had not yet been completed; an addendum describing the springs will be added to this report in 2005. Well #1 Fish Creek is located two miles due east of the outskirts of Lava Hot Springs and approximately ½-mile downstream of the Fish Creek springs and serves as a secondary source to the springs. Well #2 W is located on a foothill west of the City of Lava Hot Springs. The wells and springs serve approximately 521 persons through approximately 288 connections. The predominant land use within the delineated capture zones of the City of Lava Hot Springs is irrigated agricultural land.

Well #1 Fish Creek is relatively well isolated. Although the identified potential contaminant sources are few in number, a major transportation corridor (U.S. Route 30) intersects the delineation. Total coliform bacteria were detected at various sample locations in the distribution system between September 1996 and April 2001, but no repeat samples were ever confirmed at the wellheads or spring sources. Total coliform bacteria have not been detected in the water system since April 2001. The inorganic chemicals (IOCs) barium, cyanide, fluoride, lead, nitrate and sodium have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical.

Well #2 W is located on a foothill west of the City of Lava Hot Springs. Total coliform bacteria were detected at various sample locations in the distribution system between September 1996 and April 2001, but no repeat samples were ever confirmed at the wellheads or spring sources. Total coliform bacteria have not been detected in the water system since April 2001. The IOCs arsenic, barium, cyanide, fluoride, lead, nitrate, and sodium have been detected in the drinking water but at levels below the MCL

for each chemical. On July 20, 2004 arsenic was detected at 0.005 milligrams per liter (mg/L), the MCL that has been recently recommended by the Environmental Protection Agency (EPA) and scheduled to take effect April, 2006. In November 2000, January 2001, and April 2001 nitrate levels in Well #2 W were 8.1 mg/L, 8.1 mg/L, and 8.7 mg/L, respectively; this is approaching the MCL of 10 mg/L for nitrate. Additionally, the radionuclides (RADs) radium-226, radium-228 and combined uranium were detected at Well #2 W in December 2001 but at below their designated MCL. The VOC tetrachloroethylene (TCE) was detected in Well #2 W at 0.6 micrograms per liter (µg/L) in November 2001, below the MCL of 5 µg/L. Tetrachloroethylene is the chemical name of perchloroethylene, a VOC compound used as a dry-cleaning or vapor-degreasing solvent and is regulated by the EPA. No synthetic organic contaminants (SOCs) have been detected in the drinking water.

A Sanitary Survey (an on-site review of a water utility's water source, facilities, equipment, and operations and maintenance records for the purpose of evaluating the system's adequacy in producing and distributing safe drinking water) for the two ground water wells was conducted by the Idaho Department of Environmental Quality (DEQ) in January 2001 to determine if the wells were in compliance with current wellhead and surface seal standards. The Sanitary Survey indicated that Well #1 Fish Creek had an inoperative pressure gauge, and it could not be determined where the exit pipe reached the creek or whether it was screened. Due to wildlife, pooling of water was observed near the pipe. Needed improvements for Well #1 Fish Creek included replacement of the pressure gauge and installation of a gauge isolation valve. Well #1 Fish Creek also needed to be raised to at least 12-inches above the pump house floor, sealed to the pump support plate, and an approved casing vent installed. Well #2 W was determined to need a downturned, screened, casing vent and the pipe connected to the floor drain was in need of repair.

Well construction directly affects the ability of the well to protect the aquifer from contaminants. If the casing and annular seal both extend into a low permeability unit then the possibility of cross contamination from other aquifer layers is reduced. If the highest water production level is greater than 100 feet below the water table, then the system is considered to have better buffering capacity.

Well log information was available for both Well #1 Fish Creek and Well #2 W. The well logs and Sanitary Survey provided detailed information to determine the system construction rating for each public water source.

Well #1 Fish Creek was constructed in the 1950s with a 12-inch, 10-inch and eight-inch diameter steel casing; the steel casing is perforated from 52-82 feet below ground surface (bgs) and from 160-225 feet bgs. The total depth of the casing is estimated to be 225 bgs. At the time the well was developed, a four-hour pump test was performed; test delivery was measured at 350 gallons per minute (gpm) with a 100 foot drawdown. No information regarding the casing thickness or surface or annular seal description is provided on the driller's log. Geological lithologic units described on the drillers log include "gravel and boulders", "blue clay", "burnt clay", and "lava rock with crevice".

Well #2 W was constructed in 1991. It was drilled to a depth of 560 feet bgs and has a 0.250-inch thick, 16-inch and 10-inch diameter steel casing that is installed to a depth 505 feet bgs into a geological unit described as "broken limestone and sandstone". The casing is perforated from 303 to 343 feet bgs, 363 to 403 feet bgs, and 443 to 483 feet bgs. The annular seal comprised of cement grout was placed to 35 feet bgs into a non-water producing low permeability geological unit described as "soft brown clay". According to the operator, the average pumping rate is 115,260 gallons per day (gpd). Geological lithologic units described on the drillers log include "soft brown clay", "sand, gravel, and quartz", broken limestone mix with quartz and gravel", "soft limestone", and "soft and medium broken limestone".

The Idaho Department of Water Resources (IDWR) Well Construction Standards Rules (1993) require all public water systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.500 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. Table 1 of the Recommended Standards for Water Works (1997) lists the required steel casing thicknesses for various well diameters. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm), a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as the condition of wellhead and surface seal, whether the casing and annular seal is placed within consolidated material or 18 feet below the surface, the thickness of the casing, etc. If all criteria are not met, the public water source does not meet current IDWR Well Construction Standards. In this case, there was insufficient information available to determine if the wells met all the criteria as outlined in the IDWR Well Construction Standards.

1.2 Drinking Water Protection Steps

The City of Lava Hot Springs prepared this Drinking Water Protection Plan in accordance with the Idaho Source Water/Wellhead Protection Plan, following the 5-step process for Drinking Water Protection. These five steps are:

Step 1: Formation of a community planning team;
Step 2: Delineation of the source water area;
Step 3: Identification of potential sources of contamination;
Step 4: Development and implementation of a management plan for the drinking water protection area; and
Step 5: Planning for the future through the development of a Contingency Plan and planning for future drinking water sources.

This plan was developed during 2004 with technical assistance from the Idaho Rural Water Association (IRWA) and the Idaho Department of Environmental Quality.

1.3 Drinking Water Protection and Source Water Assessment

Source Water Assessment involves two of the five drinking water protection steps discussed above. These two steps are source water delineation (Step 2) and potential contaminant source inventory (Step 3). An additional Source Water Assessment step includes a susceptibility analysis, which helps identify contaminant threats to the system by evaluating land use, contaminant sources, well construction, and hydrologic conditions such as geology and soil type. By pursuing Drinking Water Protection, the City of Lava Hot Springs is addressing the primary goal of the Source Water Assessment process.

2.0 COMMUNITY PLANNING TEAM

The members of the City of Lava Hot Spring's Drinking Water Protection Community Planning Team include the following individuals listed in Table 1.

Table 1. City of Lava Hot Spring's Drinking Water Protection Community Planning Team

Raymond E. Bailey	Mayor, City of Lava Hot Springs; resident, City of Lava Hot Springs
Tom Lawler	Resident, City of Lava Hot Springs
Robert D. Bergendorf	Resident, City of Lava Hot Springs
George Linford	Resident, City of Lava Hot Springs
Mark Lowe	Resident, City of Lava Hot Springs

Technical Assistance was provided by:

David Risley	DEQ, State Office, Boise
Michelle Byrd	DEQ, Regional Office, Pocatello
Melinda Harper	Ground Water Protection Specialist, IRWA

2.1 Duties of the Community Planning Team

Tom Lawler was named to be the Team Coordinator and has the responsibility of planning future team meetings and coordinating the implementation schedule. The Team Coordinator will also be the designated contact in case of a water system emergency, and will be the lead contact for any outside references to this Plan. The DEQ and the IRWA will continue to provide support and technical assistance to the Community Planning Team regarding any of the Plan's strategic components. Below is the "Scope of Work" that will be used by the Community Planning Team to implement their drinking water protection strategy outlined throughout this Plan.

2.2 Implementation Duties (Scope of Work)

The Community Planning Team will:

- Hold annual meetings (meeting dates and locations will be announced and posted) to review and update the Plan and its components;
- Update the potential contaminant source inventory;
  - Remove potential contaminant sources that no longer exist or not longer pose a threat; and
  - Add any new sources of potential contaminants found in the protection area (Appendix C);
- Evaluate new potential contaminant sources for their risk to the system;
- Prioritize the contaminant risk of point sources within Zone IA or IB, and then develop and implement a protection strategy to manage the potential contaminant source;
- Assess nonpoint potential contaminant sources, determine their potential risk(s), develop and implement a protection strategy, and add new strategies to the implementation schedule;
  - Review and update the Contingency Plan (Appendix E); and
  - Review and update the Implementation Schedule;
- Use information materials found in "*Protecting Drinking Water Sources in Idaho"* to implement public education and outreach activities in accordance with the Implementation Schedule;

Examples may include:

  - Plan fertilizer (nutrient) management planning workshops with help of the University of Idaho Extension, Bannock County Soil and Water Conservation District, local fertilizer retailers, or the Natural Resources Conservation Service;
  - Encourage local household hazardous waste collection events;
  - Mail fact sheet summarizing the Drinking Water Protection Plan to public water system users;
  - Mail out frequent water quality reminders with the water bill; and
  - Make the drinking water protection materials listed throughout the Plan available;
- Evaluate the need and applicability of a City of Lava Hot Springs Drinking Water Protection Ordinance (Appendix D provides an example of a Drinking Water Protection Ordinance); and
- Initiate discussions with Bannock County Planning and Zoning to promulgate the process of establishing a County Drinking Water Protection Ordinance and/or Overlay District.

3.0 DRINKING WATER PROTECTION AREA SOURCE WATER DELINEATION

The City of Lava Hot Spring's *Source Water Assessment Final Report* (City of Lava Hot Springs PWS 6030030 Source Water Assessment Final Report, DEQ, June 4, 2002) provides a detailed description of the delineated source water area. The Source Water Assessment is excerpted in the following sections.

In 1989, the Idaho Legislature enacted the Ground Water Quality Protection Act that set forth the development of the State Wellhead Protection Plan, also known as Drinking Water Protection. The State Plan provides that the Drinking Water Protection Area (DWPA) is divided into four zones (IA, IB, II, and III). All zones are designed to prevent microbial or chemical contamination of the City of Lava Hot Spring's' drinking water supply wells.

- Zone IA is the sanitary setback zone designed to prevent microbial contamination within a 100 foot radius of the well. This setback zone is established in the Idaho Rules for Drinking Water Supplies (IDAPA 58.01.08.900.01) and requires that: sewer lines, livestock, canals, and streams be 50 feet from the source water/wellhead and that: home septic tanks, seepage pits, disposal fields, and privies are 100 feet away;
- The 0-3-year time-of-travel (TOT) zone (zone indicating the number of years necessary for a particle of ground water to reach the wellhead) corresponds to DWP Zone IA and IB;
- The 3-6-year TOT zone corresponds to DWP Zone II; and
- The 6-10-year TOT zone corresponds to DWP Zone III. Time related capture zones for the City of Lava Hot Spring's Well #1 Fish Creek and Well #2 W are presented in Appendix A.

3.1 Geology and Hydrogeology

The Portneuf Valley-Gem Valley hydrologic province (a large region characterized by similar hydrologic history and development) occupies approximately 211 square miles east of Pocatello, Idaho. The Basin and Range physiographic province trends north to south and is bounded by the Wasatch mountain range to the southeast, the Chesterfield mountain range to the east, and the Portneuf mountain range to the west. Average annual precipitation ranges from less than 15 inches on the valley floor near Bancroft to 35 inches in the mountains (Norvitch and Larson, 1970). The average total depth for 26 ground water wells in the Lava Hot Springs area is 188 feet bgs; the average depth to ground water is 83 feet bgs (Baldwin, 2001).

The Portneuf and Gem valley floors consist of Quaternary (the second period of the Cenozoic era, following the Tertiary; also, the corresponding system of rocks. It began two to three million years ago and extends to the present. It consists of two grossly unequal epochs: the Pleistocene, up to about 8,000 years ago, and the Holocene since that time) alluvium (a general term for deposits made by streams on river beds, flood plains and alluvial fans; the term applies to stream deposits of recent time), Quaternary olivine basalt flows, and sedimentary rocks of the Tertiary Salt Lake Formation (Norvitch and Larson, 1970; Norton, 1981). The basalt flows overlie and inter-finger sedimentary deposits in the main portion of the province (Dion, 1969). The basalts were extruded from cones and fissures near Alexander and between Niter and the Grace power plant and the Blackfoot Lava Field (Norton, 1981). A surface geologic map of the Portneuf River Basin indicates that the western arm of the province is composed primarily of Quaternary alluvial deposits and Tertiary sedimentary rock outcrops (Norvitch and Larson, 1970). Ground water occurs in virtually every geologic unit however the principal aquifer is comprised of basalt. A broad northwest trending mound of water forms a ground water divide in the basalt aquifer at the southern margin of the province (Dion, 1969; Norton, 1981). Water north of the divide flows to the Snake River, and water south of the divide flows to the Bear River drainage that empties into the Great Salt Lake in Utah. Available water table maps indicate that the general ground water flow direction in the area of the City of Lava Hot Springs is to the Portneuf River, a tributary of the Snake River (Norvitch and Larson, 1970).

The primary source of ground water recharge to the basalt aquifer is precipitation on the valley floor and the surrounding mountains. Other sources are underflow (the movement of ground water through the

soil or a subsurface stratum, or under a structure, specifically the water flowing in the bed of a stream, in the same direction but much more slowly) from the Soda Springs hydrologic province through the gap at Soda Point and at Tenmile Pass, percolation from irrigation, canal leakage, and stream losses (Norton, 1981; Dion, 1974). The primary ground water discharge mechanisms are evapotranspiration, discharge through hundreds of springs and seeps, pumpage from wells, and underflow through the Portneuf Gap (Norton, 1981; Norvitch and Larson, 1970; Dion, 1969).

There is little usable information available on the direction of ground water flow in the alluvial and sedimentary rock aquifers. Flow in the alluvial aquifer located in the western arm of the Soda Springs hydrologic province can be assumed to follow the Portneuf River and have roughly the same gradient as the surface topography. Making the same assumptions for the sedimentary rock aquifer is not reasonable. The folded and fractured sedimentary rocks that underlie the Portneuf and Gem valleys also make up the bulk of the surrounding mountains. Ground water moving through these formations will tend to follow bedding plants, folds, and fractures that pass under mountain ridges. Consequently, the ground water flow may cross topographic divides and discharge to a valley different from that of the recharge area (Ralston et al., 1979).

3.2 Source Water Delineation

The delineation process establishes the physical area around a well, spring, or surface water intake that will become the focal point of the assessment. The process includes mapping the boundaries of the zones of contribution into time-of-travel (TOT) zones for ground water in the aquifer. The source water assessment for the ground water wells was completed prior to the source water assessment for the springs, however when developing the zone of contribution for the springs, the same principles will apply.

DEQ contracted with the Washington Group International, Inc. (WGI) to perform the source water delineations using a calculated fixed-radius method to determine the 3-year (Zone IA and IB), 6-year (Zone II), and 10-year (Zone III) TOT capture zones for water associated with the Portneuf Valley-Gem Valley hydrologic province in the vicinity of the City of Lava Hot Springs. The fixed radii for the 0-3 year, 3-6 year, and 6-10 year capture zones were calculated using equations presented by Keely and Tsang (1983) for the velocity distribution surrounding a pumping well. The City of Lava Hot Spring's wells are completed or assumed to be completed in basalt and sandstone, based on the well driller's logs and/or proximity to wells of known completion and similar depth. The assumed pumping rate for Well #1 Fish Creek is the same as the average daily rate for Well #2 W because no other production data are available.

Fixed radius calculations resulted in radial distances ranging from 386 linear feet to 723 linear feet for the 0-3 year TOT for both wells. The 6-10-year TOT distance is 1,565 linear feet for both wells in the City of Lava Hot Springs. The total area including the 0-3 year, 3-6 year and 6-10 year capture zones is 0.28 square miles for both wells (Appendix A, Figures A2-A3). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

The capture zones delineated herein are based upon limited data and must be taken at best estimates. If more data become available in the future these delineations should be adjusted based on additional modeling incorporating the new data.

4.0 POTENTIAL SOURCES OF GROUND WATER CONTAMINATION

An inventory of potential point sources of contamination is the third step of a Drinking Water Protection plan. Point sources are facilities and/or activities that store, use, or produce potential contaminants regulated under the Safe Drinking Water Act. There must be a potential for a release of those potential contaminants at a high enough level that could affect drinking water quality. It is important to understand that a release may never occur from a listed point source, particularly if the facility is using best management practices (BMPs) that are designed to reduce contamination risks. If a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that they are in violation of any local, state, or federal environmental law or regulation. What it does mean is that the ***potential*** for contamination exists due to the nature of the business, industry, or operation.

There are a number of methods water systems can use to work cooperatively with facilities generating a potential contaminant source. These involve education and encouraging regular inspections of stored materials. Identifying activities that may pose a potential threat to ground water quality provides communities with an understanding of the possibility of contamination and basic information that can be useful for designing different controls and determining the areas in which they should be applied. Sources that could potentially contaminate the drinking water supply for the City of Lava Hot Springs include both point and nonpoint sources of contamination. Point sources of contamination occur at distinct locations. They are often regulated and require permits or registration for facilities that sell, use or store those materials (such as chemical storage sheds). Nonpoint sources of contamination often occur over large areas and can result from normal every day activities such as agricultural activities or lawn chemical usage.

4.1 Point Sources

During February of 2002, a two-phased potential contaminant inventory of the study area was conducted and is excerpted below (City of Lava Hot Springs PWS 6030030 Source Water Assessment Final Report, DEQ, June 4, 2002). The first phase involved identifying and documenting potential contaminant sources within the City of Lava Hot Spring source water delineation areas (Figures A2-A3) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ (Tables 2-3). The second, or enhanced phase of the potential contaminant source inventory, involved allowing the City of Lava Hot Spring's certified operator, Tony Hobson to validate the sources identified in phase one and to identify additional potential sources of contamination in the delineated Drinking Water Protection Areas. At the time of the enhanced contaminant source inventory, dimensions of the municipal wastewater land application site were clarified. Maps with well locations, delineated source water areas and potential contaminant sources are provided with this report (Appendix A). Each potential contaminant source has been given a unique number that references tabular information associated with each public water well (Tables 2-3).

Potential contaminant sources identified within the delineated capture zone for the City of Lava Hot Spring's Well #1 Fish Creek and Well #2 W include Fish Creek, Fish Creek Road, a transportation corridor (U.S. Route 30), a wastewater land application site, an above ground storage tank (AST), a municipal National Pollutant Discharge and Elimination System (NPDES), and the Portneuf River. If an accidental spill occurred on the roads or into the creeks, IOCs, VOCs, SOCs and microbial contaminants could be added to the aquifer system. Table 2 and Table 3 list the potential contaminant sources within the source water delineations of the City of Lava Hot Spring's drinking water source.

Table 2. Well #1 Fish Creek Potential Contaminant Source Inventory

SITE #	Source Description[1]	TOT[2] Zone (years)	Source of Information	Potential Contaminants[3]
	Fish Creek	0-10	GIS Map	IOC, VOC, SOC, M
	Fish Creek Road	0-10	GIS Map	IOC, VOC, SOC, M
	U.S. Route 30	0-10	GIS Map	IOC, VOC, SOC, M

1=Status of source description.
2= TOT=time-of-travel (in years) for a particle of ground water to reach the wellhead.
3=IOC=Inorganic Compound; VOC=Volatile Organic Compound; SOC=Synthetic Organic Compound; M=Microbes (total coliform).

Table 3. Well #2 W Potential Contaminant Source Inventory

SITE #	Source Description[1]	TOT[2] Zone (years)	Source of Information	Potential Contaminants[3]
1,4	WLAP Site	3-10	Database Search	IOC, M
2	AST; historic	3-6	Enhanced Inventory	VOC, SOC
3	NPDES; municipal	6-10	Database Search	IOC, M
	Portneuf River	6-10	GIS Map	IOC, VOC, SOC

1=Status of source description; WLAP=Wastewater Land Application Site; NPDES=National Pollutant Discharge and Elimination System.
2= TOT=time-of-travel (in years) for a particle of ground water to reach the wellhead.
3=IOC=Inorganic Compound; VOC=Volatile Organic Compound; SOC=Synthetic Organic Compound; M=Microbes (total coliform).

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the City of Lava Hot Springs, drinking water protection activities should focus on identifying the source of tetrachloroethylene contamination in Well #2 W. If tetrachloroethylene concentrations approach or exceed the MCL, the system should take appropriate measures to treat the water source prior to distribution. Treatments such as granular activated charcoal and packed tower aeration for VOC contaminants should be investigated to remedy this problem. In addition, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey. In the event that microbial problems arise or other chemicals tested approach or exceed the MCL (such as nitrate), the system should take appropriate treatment measures. Well #1 Fish Creek is currently disinfected; such a system could be installed for Well #2 W. Other treatments such as reverse osmosis for VOCs should be investigated, should problems arise. Any new sources that could be considered potential contaminant sources in the well's zone of contribution should be investigated and monitored to prevent future contamination. No potential contaminants such as paint, fuel, pesticides, cleaning supplies, etc. should be stored or applied within 50 linear feet of the well. The wells should maintain sanitary standards regarding wellhead protection.

Land uses within most of the Drinking Water Protection Area are outside the direct jurisdiction of the City of Lava Hot Springs, therefore partnerships with state and local agencies, industrial and agricultural groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, working with local schools to promote drinking water protection, and the importance of water conservation. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Bannock County Soil and Water Conservation District, and the Natural Resources Conservation Service. As a major transportation corridor intersects the delineations (U.S. Route 30), the Idaho Transportation

Department (ITD) should be involved in protection efforts. Activities such as recreation should be coordinated with the Bureau of Land Management (BLM), the Idaho Department of Fish & Game, and other related agencies.

4.2 Nonpoint Sources

The predominate land use within the City of Lava Hot Spring's delineated drinking water protection area is irrigated agricultural land. U.S. Route 30 runs north and south through Lava Hot Springs. Land use within the immediate area of the wellheads consists of commercial and residential properties as well as land used for agriculture. Nonpoint sources of contamination associated with these land uses are primarily agricultural chemicals including pesticides (insecticides and herbicides) and fertilizers. Additional potential nonpoint sources within the Drinking Water Protection Areas include incorrect usage and disposal of hazardous household chemicals such as cleaning solvents, used motor oils and degreasers, and private septic systems . Throughout the drinking water protection area, pesticides used by area homeowners and home fuel storage also pose threats to ground water quality.

5.0 DRINKING WATER PROTECTION MANAGEMENT TOOLS

Non-regulatory methods will primarily be utilized to manage contaminant sources located within the Drinking Water Protection Area. Non-regulatory approaches rely on voluntary implementation of education and information outreach programming to be effective. The ultimate goal of public awareness and education is to empower the public so they can implement drinking water protection efforts.

Regulatory approaches rely on the assistance of City and County enforcement agencies such as Planning and Zoning to provide an "umbrella" of protection to the City of Lava Hot Springs.

5.1 Regulatory Approaches

Regulatory approaches to drinking water protection are used by municipalities who have the authority to pass laws or ordinances.

The City of Lava Hot Springs will cite the Idaho Rules Governing Public Drinking Water Systems, which prohibit any potential contaminant source within the setback area of a public drinking water source. The City of Lava Hot Springs will also consider applying for changes in the county zoning overlay and registering their Drinking Water Protection Plan with Bannock County Planning and Zoning to protect the Department's drinking water from potential contaminating activities that occur outside the City of Lava Hot Springs' jurisdiction. Should the City of Lava Hot Springs desire, a city ordinance may be passed to help protect that portion of the Drinking Water Protection Area located within the city limits of the City of Lava Hot Springs. Other regulatory options the City of Lava Hot Springs may pursue include overlay district development, zoning, and comprehensive plan modifications. All of these approaches can be used to help reduce ground water contamination risks from specific potential contaminant sources. An example of a drinking water protection ordinance designed to protect drinking water can be found in Appendix D. Section 9.5.1 discusses regulatory measures that could be adopted by the City of Lava Hot Springs to protect drinking water quality.

5.2 Non-regulatory Approaches

These management approaches are intended to reach as broad a spectrum of the community as possible. Protection of the communities' drinking water is really possible only if the whole community cooperates to achieve protection. Public education is an essential tool for drinking water protection, and the majority of the non-regulatory approaches discussed below rely on public education for effective implementation. The implementation strategy is also discussed in many of the following approaches.

5.2.1 Public Education
Ongoing public education will be provided to the general public, the business community, and municipal officials on the necessity of protecting the water supply. This education includes many of the public participation activities and events described below within Sections 6.0 and 9.0. These public participation activities and events include public hearings, city council meetings, informational mailings in water bills, and school district activities.

5.2.2 Pollution Prevention
Pollution prevention is waste prevention and resource conservation. Today, the emphasis is on preventing the waste from being generated in the first place, versus recycling unused, over-purchased, waste material. The goals are to conserve natural resources and protect the quality of the land, water and air, work toward the reuse of items, use products with long lives, use natural resources efficiently, and use processes that reduce consumption and waste. Pollution prevention is source reduction or any practice that reduces the amount of any pollutant entering any waste stream.

A good example of a pollution prevention problem is the runoff and downward leaching of lawn fertilizer applications; lawn fertilizers commonly used can contain both a high level of nitrogen and herbicides. The primary source of the problem is the over-application of fertilizer associated with an over-application of water, or a normal application of fertilizer associated with an over-application of water. One pollution prevention answer would be to address applying the appropriate amount of fertilizer and other chemicals to a lawn, along with proper water application rates. The use of BMPs is strongly suggested (Section 5.2.5).

The City of Lava Hot Springs will make information available on pollution prevention practices relevant to homeowners and businesses alike. Pollution prevention will be most effective at reducing the amount of household or business-related hazardous waste stored on site by creating the awareness of recycling opportunities. The DEQ Pollution Prevention Program and a non-profit pollution prevention organization called GEMStars are available to carry out pollution prevention activities for businesses. Information on GEMStars is available through their website at http://www.idahogemstars.org. In addition, the owners of each potential contaminant source will be made aware of Idaho's "Voluntary Pollution Prevention Program" and the additional assistance these program personnel can provide.

5.2.3 Groundwater Guardian Community Membership
The Groundwater Guardian Program supports, recognizes, and connects communities protecting ground water. It is designed to empower local citizens and communities to take voluntary steps toward protecting their ground water resources and can be a catalyst for programs such as drinking water protection. An implementation schedule consists of Result Orientated Activities (ROAs) that a community planning team and community develop to ensure measures are taken to protect the community's drinking water. To achieve Groundwater Guardian status, a community must submit annual entry forms and develop and implement ROAs. The Groundwater Guardian Program application materials are available on-line via the Groundwater Foundation's web site – http://www.groundwater.org – in the Groundwater Guardian section.

5.2.4 Home*A*Syst and Farm*A*Syst
The Home*A*Syst Project (H*A*S) and Farm*A*Syst Project (F*A*S) are designed to help homeowners become aware of conditions or practices on their property that increase the risk of drinking water contamination. The H*A*S and F*A*S materials allow a homeowner, farmer, or rancher to assess practices and activities for their potential to contaminate ground water. The fact sheets provide

information about practices and structures that can help reduce the risk of ground water contamination. The project is coordinated by the Idaho Association of Soil Conservation Districts and is available at no cost to interested parties. Information on H*A*S may be obtained through their website at http://www.uwex.edu/homeasyst/; information on F*A*S may be obtained through their website at http://www.uwex.edu/farmasyst/.

5.2.5 Best Management Practices

Best Management Practices (BMPs) are conservation practices or systems of practices and management measures that:

- reduce water quality degradation caused by nutrients, animal waste, toxics, and sediment, as well as control soil loss; and
- minimize adverse impacts on surface water, groundwater flow, and circulation patterns and on the biological, chemical, and physical characteristics of wetlands.

BMPs applicable to many potential contaminant sources will either be distributed to those listed in Tables 2-3 or made available through the City of Lava Hot Springs. These BMPs can be applicable to both point and nonpoint sources of contamination such as abandoned wells, agricultural and homeowner usage of fertilizers and pesticides, spill prevention within businesses where chemicals are handled, USTs, agrichemical mixing and storage, and private septic systems. Information on how to obtain technical and financial assistance for BMP implementation may be found in Sections 5.2.2 through 5.2.4. The DEQ is available to assist the City of Lava Hot Springs in identifying appropriate BMPs or identifying agencies or entities that can help provide BMPs and implementation assistance.

5.2.6 Household Hazardous Waste Collection

Community Planning Team members and city officials will encourage the development of a local household hazardous waste collection day and, at a minimum, will inform residents of household hazardous waste collection events within Bannock County or neighboring Lava Hot Springs communities.

5.2.7 Water Conservation

Another non-regulatory management approach that will be pursued by the City of Lava Hot Springs will be to encourage water conservation. Water conservation can help a community in many ways, including:

1) Allowing the most efficient use of water within the drinking water system to defer capital expenditures to increase the water system capacity;
2) Reducing the load on municipal or private waste treatment facilities;
3) Reducing the total quantity of water withdrawn from a ground water aquifer, thus slowing the movement of contaminants within the aquifer and allowing a longer period of time for natural processes to degrade them;
4) Reducing the total quantity of water withdrawn from a ground water aquifer by the drinking water system, conserving drinking water for consumption by other users down-gradient and thus helping to ensure a continued supply for all; and
5) Controlling the over-application of lawn irrigation water to limit the leaching of agricultural chemicals into the groundwater.

5.2.8 Water Quality Data Reviews

Water quality data from the City of Lava Hot Springs' Well #1 Fish Creek, Well #2 W, and any ground water quality monitoring results in the vicinity of the City of Lava Hot Springs' Drinking Water

Protection Area will be reviewed by the City of Lava Hot Springs' Drinking Water Protection Coordinator and DEQ at least once every three years prior to recertification (currently, certification is for a period of three years), or more often if significant new data is made available or water quality problems are identified in the vicinity. This will help evaluate trends or identify threats to the City of Lava Hot Springs' drinking water. Ground water quality monitoring results from private wells in the Lava Hot Springs area can be provided by the U.S. Geological Survey (USGS). Relevant information will be made available to the community via the City of Lava Hot Springs' Drinking Water Protection Coordinator or the appropriate state or federal agencies.

6.0 MANAGEMENT TOOLS AND PROTECTION MEASURES FOR POTENTIAL CONTAMINANT SOURCES

The City of Lava Hot Springs' Drinking Water Protection Community Planning Team has not prioritized any specific potential contaminant sources at this writing. The focus of initial implementation will be public education and awareness.

The Community Planning Team will evaluate and identify any specific potential contaminant sources as part of the annual Plan review. Appropriate management tools and protection measures will be initiated as potential contaminate sources are identified.

6.1 Management Tools

An education program will be initiated and utilized to create public awareness of the vulnerability of the City of Lava Hot Springs' drinking water to potential contaminant sources. Section 9 outlines a proposed implementation strategy and schedule.

7.0 CONTINGENCY PLAN

A contingency plan is the blueprint outlining roles and responsibilities in the event that the drinking system experiences a disruption due to contamination, loss of power, natural disasters such as drought or flooding, or other circumstances where it cannot provide services. The development and implementation of a contingency plan increases the likelihood that correct and immediate action will be taken and that any damage or potential health risk, both in the long and short term, will be minimized. The contingency plan is designed to assist and facilitate community actions in the event of a drinking water emergency. A contingency plan will help the City of Lava Hot Springs make well thought-out, educated decisions under the most adverse of conditions. Appendix E contains the Contingency Plan for the drinking water supply for the City of Lava Hot Springs. Copies of the Contingency Plan should be located in Lava Hot Springs' City Hall, and at the Public Works shop.

7.1 Emergency Spill Response

The primary concern of any "First Responder" at an emergency is for the immediate public health and safety of those citizens involved. In the event of a release of hazardous materials, the designated personnel will contact appropriate state and federal agencies for a rapid and concise response. The Idaho Bureau of Hazardous Materials Action Plan and Emergency Spill Response Flow Chart (Appendix F) will be referred to. The City of Lava Hot Springs will also implement their Contingency Plan in case the water system is impacted. Additional information on state and federal agencies with emergency planning roles, including phone numbers, can be found in Section VII of the Contingency Plan.

8.0 PLANNING FOR NEW WATER SOURCES

This Plan includes a review of water quality and supply, and evaluation of the need for a new water source. When a potential need is identified, drinking water protection areas will be estimated to determine the safest location for a new water source. New drinking water sources will be delineated in a manner consistent with the delineation process for existing drinking water sources. In addition, if there are major changes to an existing source's construction, discharge rate or pumping rate, then the existing delineation should be reviewed to ensure that it still represents the appropriate source water protection zones. Delineations may be updated or modified if significant new information becomes available.

The delineation for any new or modified well site will be inventoried for any potential contaminant sources, and the potential risk to the drinking water system evaluated. The anticipated pumping rate and existing knowledge of the aquifer will be used to determine which proposed location for potential new wells would provide the least risk of contamination. The City of Lava Hot Springs will then take appropriate actions to prevent unwanted development near the new well site.

8.1 Encroachment

Encroachment is an issue that is now affecting more and more public water systems throughout the State of Idaho. With increasing populations, industrial and commercial developments and the seemingly never-ending sprawl of suburbs, communities with groundwater wells and surface intakes once located in isolated areas are now facing challenges associated with the steadily increasing number of potential contaminant sources surrounding the area. Although a daunting task, the responsibility of addressing such an issue and taking actions including but not limited to purchasing land where a new water source will be eventually located must rest with the governing members of the community. By taking control of and managing the site(s) of existing or new drinking water sources, community leaders are in a position of serving their community by guarding its most valuable resource, clean, safe drinking water.

9.0 IMPLEMENTATION STRATEGY

The strategy for implementing this Drinking Water Protection Plan is an important component of any local drinking water protection program. Without the continued efforts and support of the Community Planning Team, city officials, and the community as a whole, the protection of the City of Lava Hot Springs' drinking water may not be accomplished as intended within this Plan. Table 4 contains the schedule outlining the protection strategy and Implementation Schedule developed by the Community Planning Team.

This schedule is a guide that the City of Lava Hot Springs will use to implement drinking water protection activities. The schedule is designed to implement protection activities that will create a sustainable Drinking Water Protection Program addressing the potential contaminant sources identified in the Source Water Assessment.

Table 4. Implementation Schedule

Goal Date	Protection Activity/ Scope of Work	Potential Contaminant Source Addressed/Method
Year 1, 2004	1. Advertise household hazardous waste disposal opportunities at the local landfill; enclose information with water bills and mail to drinking water users.	All sources/Public awareness and education; pollution prevention; BMPs.

	2. Provide "tips and trivia" BMPs in water bills; mail to drinking water users. 3. Evaluate potential contaminant sources and rank in terms of wellhead susceptibility. 4. Complete "Security Vulnerability Self Assessment Guide for Small Drinking Water Systems"; keep document in secured location.	All sources/Public awareness and education; pollution prevention; water conservation; BMPs. All sources/Pollution prevention; threat and security preparedness. All sources/Pollution prevention; water conservation; threat and security preparedness.
Year 2, 2005	1. Advertise household hazardous waste disposal opportunities at the local landfill; enclose information with water bills and mail to drinking water users. 2. Provide "tips and trivia" BMPs in water bills; mail to drinking water users. 3. Implement security deficiencies and other needs as identified in source water assessment. 4. Consider development and implementation of city drinking water protection ordinance. 5. Amend Drinking Water Protection Plan to include Spring information when Source Water Assessment is completed by DEQ.	All sources/Public awareness and education; pollution prevention; BMPs. All sources/Public awareness and education; pollution prevention; water conservation; BMPs. All sources/Pollution prevention; threat and security preparedness. All sources/Public awareness and education; pollution prevention; water conservation; BMPs. All sources/Public awareness and education; pollution prevention; threat and security preparedness; BMPs.
Year 3, 2006	1. Advertise household hazardous waste disposal opportunities at the local landfill; enclose information with water bills and mail to drinking water users. 2. Provide "tips and trivia" BMPs in water bills; mail to drinking water users. 3. Implement security deficiencies identified in source water assessment to ensure security measures are taken at wells. 4. Evalute need for city-wide cross-connection program and implement.	All sources/Public awareness and education; pollution prevention; BMPs. All sources/Public awareness and education; pollution prevention; water conservation; BMPs. All sources/Pollution prevention; threat and security preparedness. All sources/Public awareness and education; pollution prevention.
Year 4, 2007	1. Recertify Drinking Water Protection Plan.	All sources/Pollution prevention; water conservation; threat and security preparedness; BMPs.

9.1 Planning for the future

To assure a safe drinking water supply for the City of Lava Hot Springs, the Community Planning Team will implement this Drinking Water Protection Plan as a long-term protection strategy for the City's

drinking water supply. The strategy outlined in this Plan will be reviewed and updated as necessary (preferably annually) to accommodate changes due to population growth, economic development or changes in land use. Table 4 is the implementation schedule for 2004 - 2007. It will need to be updated along with the Contingency Plan when the Community Planning Team meets to update this Plan. The City of Lava Hot Springs' Source Water Assessment will be utilized as a tool to help assess potential hazards to drinking water quality. The DEQ is available to provide technical assistance to the Community Planning Team whenever new potential contaminant sources need to be addressed.

9.2 Community Planning Team

The Drinking Water Protection Community Planning Team for the City of Lava Hot Springs should meet at least annually to coordinate drinking water protection activities and to review and update the Implementation Schedule. The meetings should focus on evaluating how well the drinking water protection activities are working and to determine whether more outreach needs to be done. These meetings should also review and update the potential contaminant source inventory, the Contingency Plan, and other sections as appropriate. Meeting notices should be made public to increase participation from members within the community.

9.3 Source Water Delineation

New drinking water sources will be delineated in a manner consistent with the delineation process used for the existing drinking water sources. If there are major changes to an existing source's construction, discharge rate or pumping rate, then the existing source water delineation should be reviewed to ensure that it still represents the appropriate drinking water protection areas. Source water delineations may be updated or modified if significant or new information becomes available.

9.4 Potential Contaminant Source Inventory

The Community Planning Team will update the potential contaminant source inventory for the Drinking Water Protection Area as new, significant potential contaminant sources are noted through general observations. If new potential contaminant sources are found, they will need to be added to the existing inventory. New potential contaminant sources will also need to be assessed for pollution prevention.

9.5 Contaminant Management Practices

The Community Planning Team will coordinate efforts to implement the contaminant management practices within Section 5.0 in accordance with the Drinking Water Protection Implementation Schedule. The Implementation Schedule for the City of Lava Hot Springs includes both regulatory and non-regulatory approaches, with the focus on non-regulatory approaches. Public education and community involvement are important implementation components. The Community Planning Team will organize public education with the assistance of partnering state and federal agencies.

9.5.1 Regulatory Approaches

The Community Planning Team and city leaders will evaluate the need and desirability of the regulatory approaches described below:

Bonding- Facilities may be required to post a bond prior to operation in a drinking water protection area. Bonds can cover costs associated with spill response or remediation efforts.

Building Codes- Local building codes offer protection through special standards applicable to facilities which are remodeled or constructed in a drinking water protection area. Building codes can require low flow fixtures, backflow prevention and other design features to conserve and protect water quality.

Design Standards- Design standards typically are regulations that apply to the design and construction of buildings or structures. This tool can be used to ensure that new buildings or structures placed within a drinking water protection area are designed so as not to pose a threat to the water supply, such as requiring an impermeable liner on a settling pond.

Operating Standards- Operating standards are regulations that apply to ongoing land-use activities to promote safety or environmental protection. Such standards can minimize the threat to a drinking water protection area from ongoing activities such as the storage and use of hazardous substances through requirements such as secondary containment and spill response capabilities, or requiring that septic systems be properly maintained.

Performance Standards- Performance standards are used to regulate development within drinking water protection areas by enforcing predetermined standards for water quality. They may be applied at a predetermined ground water monitoring compliance point, at the point of injection, or through the use of contaminant source modeling. One example is the requirement that the amount of storm water runoff be the same before and after construction when developing or improving a site.

Potential Source Prohibitions or Restrictions- Source prohibitions or restrictions are regulations that prohibit or place restrictions on the use of certain chemicals that pose a high risk to water contamination such as Atrazine or Trichloroethene, or prohibit or place restrictions on the placement of some high-risk potential contaminant sources such as underground storage tanks, underground injection wells, lagoons, feedlots, or landfills.

Site Plan Review- Site plan reviews are regulations requiring developers to submit for approval plans for developments occurring within a given area. This tool ensures compliance with regulations or other requirements made within a drinking water protection area.

Special Permitting or Reviews- Special permits or reviews are used to set conditions for certain uses and activities that pose a high risk to water contamination within drinking water protection areas if left unregulated. One example is to require that new feedlots within certain drinking water protection area zones be required to have a city or county permit or review that requires ground water quality monitoring and the use of certain water quality protection management practices.

Subdivision Ordinances- Subdivision ordinances are applied to land divided into two or more subunits for sale or development. Local governments use this tool to protect drinking water areas in which ongoing development is causing contamination. An example of a subdivision ordinance would be to require a minimum lot size for single family homes using septic systems so as to limit septic system density and subsequent ground water contamination.

Transport Prohibitions- The transport of chemical compounds, which pose a high risk to water quality if spilled, can be restricted within a drinking water protection area by requiring alternative transportation routes.

Zoning Ordinance- Zoning ordinances typically are comprehensive land-use requirements designed to direct the development of an area. Many local governments have used zoning to restrict or regulate certain land uses, which have the potential to contaminate water within drinking water protection areas.

Zoning Overlay-Overlay zones can be used in conjunction with conventional zoning to create special districts that protect a drinking water protection area. Overlay zones are applied to areas singled out for

special protection, such as a drinking water protection area, and add regulations to those controls already in place. This method helps address "grandfathered" potential contaminant sources in drinking water protection areas.

9.5.2 Non-regulatory Approaches

The Community Planning Team will coordinate efforts to implement non-regulatory approaches to drinking water protection, with the City of Lava Hot Springs taking the lead role toward implementing many of the approaches found in Section 5.2, including Groundwater Guardian community membership and educational activities discussed under Sections 5.2.1 and 5.2.2. A major component of the implementation strategy is to work with the local community and the various local, state, and federal programs and personnel available for implementation assistance. This includes obtaining assistance from the Home*A*Syst or Farm*A*Syst coordinator and DEQ Pollution Prevention Program personnel as discussed under Sections 5.2.3 and 5.2.4.

The DEQ Source Water/Wellhead Protection Coordinator located at the DEQ-Pocatello Regional Office and other appropriate DEQ support personnel, as requested by the Community Planning Team, can assist in the area of coordinating support among the various local, state, and federal programs. The DEQ Source Water/Wellhead Protection Coordinator will also help with water quality data reviews (Section 5.2.8) and can assist with public education outreach programs on best management practices (Sections 5.2.2 and 5.2.5).

The Community Planning Team will work with the local community where desirable to help identify and pursue available funding opportunities for implementing different approaches. This can include working with the Natural Resources Conservation Service to obtain Environmental Quality Improvement Project funds for agricultural BMP implementation or working with the DEQ to obtain Nonpoint Source Section 319 BMP implementation funding. Chapter 4 of the Idaho Nonpoint Source Management Plan contains a comprehensive list of funding sources available for implementation of BMPs.

9.6 Additional Implementation Considerations

The City of Lava Hot Springs' Contingency Plan and efforts associated with planning a new well location will be updated on an as-needed basis as determined by the Community Planning Team. Once source water assessment information is made available, the Community Planning Team will evaluate the information, particularly the susceptibility analyses, and decide if there are any needed modifications or additions to this Plan or its implementation. Information from capacity development and the City of Lava Hot Springs' water system master plan will also be taken into consideration for drinking water protection planning and implementation purposes, as determined by the Community Planning Team.

10.0 SECURITY VULNERABILITY SELF-ASSESSMENT GUIDE FOR SMALL DRINKING WATER SYSTEMS

Water systems are critical to every community. Protection of public drinking water systems must be a high priority for local officials and water system owners and operators to ensure an uninterrupted drinking water supply, which is essential for the protection of public health (safe drinking water and sanitation) and safety (fire fighting).

Adequate security measures will help prevent loss of service through terrorist acts, vandalism, or pranks. If a system is prepared, such actions may even be prevented. The appropriate level of security is best determined by the water system at the local level.

A Security Vulnerability Self-Assessment Guide is designed to help small water systems determine possible vulnerable components and identify security measures that should be considered. A "vulnerability assessment" is the identification of weaknesses in water system security, focusing on defined threats that could compromise its ability to provide adequate potable water, and/or water for firefighting. This document is designed particularly for systems that serve populations of 3,300 or less. This document is meant to encourage smaller systems to review their system vulnerabilities, but it may not take the place of a comprehensive review by security experts.

This document is designed for use by water system personnel. Physical facilities pose a high degree of exposure to any security threat. This self-assessment should be conducted on all components of your system (wellhead or surface water intake, treatment plant, storage tank(s), pumps, distribution system, and other important components of your system).

The Assessment will include an emergency contact list for the system's use. This list will help the system identify who needs to be contacted in the event of an emergency or threat and will help the system develop communication and outreach procedures.

The purpose of this document is to start the process of security vulnerability assessment and security enhancements. Security is not an end point, but a goal that can be achieved only through continued efforts to assess and upgrade a system.

This is a sensitive document and as such should be stored separately in a secure place at the water system. A duplicate copy should also be retained at a secure off-site location.

Access to this document should be limited to key water system personnel and local officials as well as the state drinking water primacy agency and others on a need-to-know basis. Therefore, this document will not be included in this report.

11.0 PUBLIC PARTICIPATION

Public participation during the development of this Drinking Water Protection Plan has included the below listed items. Additional public participation will be pursued as part of the implementation process.

- Public meetings;
- Discussion at town council meetings;
- Articles in local newspapers;
- Flyers posted at appropriate locations throughout City (Post office, City Hall, convenience stores, gas stations, etc.);
- Community Workshops.

Citizens can obtain updated information on the City of Lava Hot Springs' Drinking Water Protection Plan, implementation efforts, Source Water Assessments, and drinking water issues at the City of Lava Hot Springs' City Hall, and the Public Works Department.

12.0 REFERENCES

1. City of Lava Hot Springs *PWS 6030030 Source Water Assessment Final Report,* DEQ, (June 4, 2002).

2. Idaho Department of Environmental Quality, *Idaho Nonpoint Source Management Plan*, (December, 2001).

3. Idaho Division of Environmental Quality, *Idaho Well Head Protection Plan*, Idaho Wellhead Protection Work Group, (February, 1997).

4. Idaho Division of Environmental Quality Ground Water Program, *Idaho Source Water Assessment Plan*, (October, 1999).

5. Idaho Department of Environmental Quality, *Design Standards for Public Drinking Water Systems*, IDAPA 58.01.08.900.01 (2000)

6. Idaho Department of Environmental Quality, *Protecting Drinking Water Sources in Idaho*, (August, 2001).

7. Idaho Department of Water Resources, 1993. *Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules*. IDAPA 37.03.09.

8. Idaho Department of Environmental Quality, 1997, *Design Standards for Public Drinking Water Systems*, IDAPA 58.01.08.550.01.

9. Baldwin, J., 2001, Personal Communication from Joe Baldwin (IDEQ) to Sara West (WGI), December 28.

10. Dion, N.P., 1969, Hydrologic Reconnaissance of the Bear River in Southeastern Idaho, U.S. Geological Survey and Idaho Department of Reclamation, Water Information Bulletin No. 13.

11. Dion, N.P., 1969, Hydrologic Reconnaissance of the Bear River in Southeastern Idaho, U.S. Geological Survey and Idaho Department of Reclamation, Water Information Bulletin No. 13.

12. Keely, J.F., and C.F. Tsang, 1983, Velocity Plots and Capture Zones of Pumping Centers for Ground Water Investigations, Ground Water, Vol.21, No.6.

13. Idaho Department of Water Resources, *Administrative Rules of the Idaho Water Resource Board Well Construction Standards Rules*, Section 04, IDAPA 37.03.09.

14. Idaho Department of Environmental Quality, *Sanitary Survey of the City of Lava Hot Springs, PWS 6030030*, 2001.

15. Norton, M.A., *Investigation of the Ground Water Flow System in Gem Valley, Idaho Department of Water Resources*, Open-File Report, 1981.

16. Norvitch, R.F., and A.L. Larson, 1970, *A Reconnaissance of the Water Resources in the Portneuf River Basin, Idaho*, U.S. Geological Survey and Idaho Department of Reclamation, Water Information Bulletin No. 16, Published by Idaho Department of Reclamation.

17. Ralston, D.R., T.D. Brooks, M.R. Cannon, T.F. Corbet, Jr., J. Singh, G.V. Winter and C.M. Wai, 1979, *Interactions of Mining and Water Resource Systems in the Idaho Phosphate Field*, Research Technical Completion Report, Project C-7651, Idaho Water Resources Research Institute and the University of Idaho.

18. Idaho Department of Environmental Quality, *Safe Drinking Water Information System (SDWIS)*.

19. Walton, W.C., 1962, *Selected Analytical Methods for Well and Aquifer Evaluation*, Bulletin 49, Illinois State Water Survey.

20. Washington Group International, Inc., October 2001, *Source Area Delineation Report for the Portneuf Valley-Gem Valley Hydrologic Province*.

APPENDIX A

Source Water Delineations

FIGURE 1 - Geographic Location of the City of Lava Hot Springs, PWS 6030030, Well #1 Fish Ck & Well #2 W

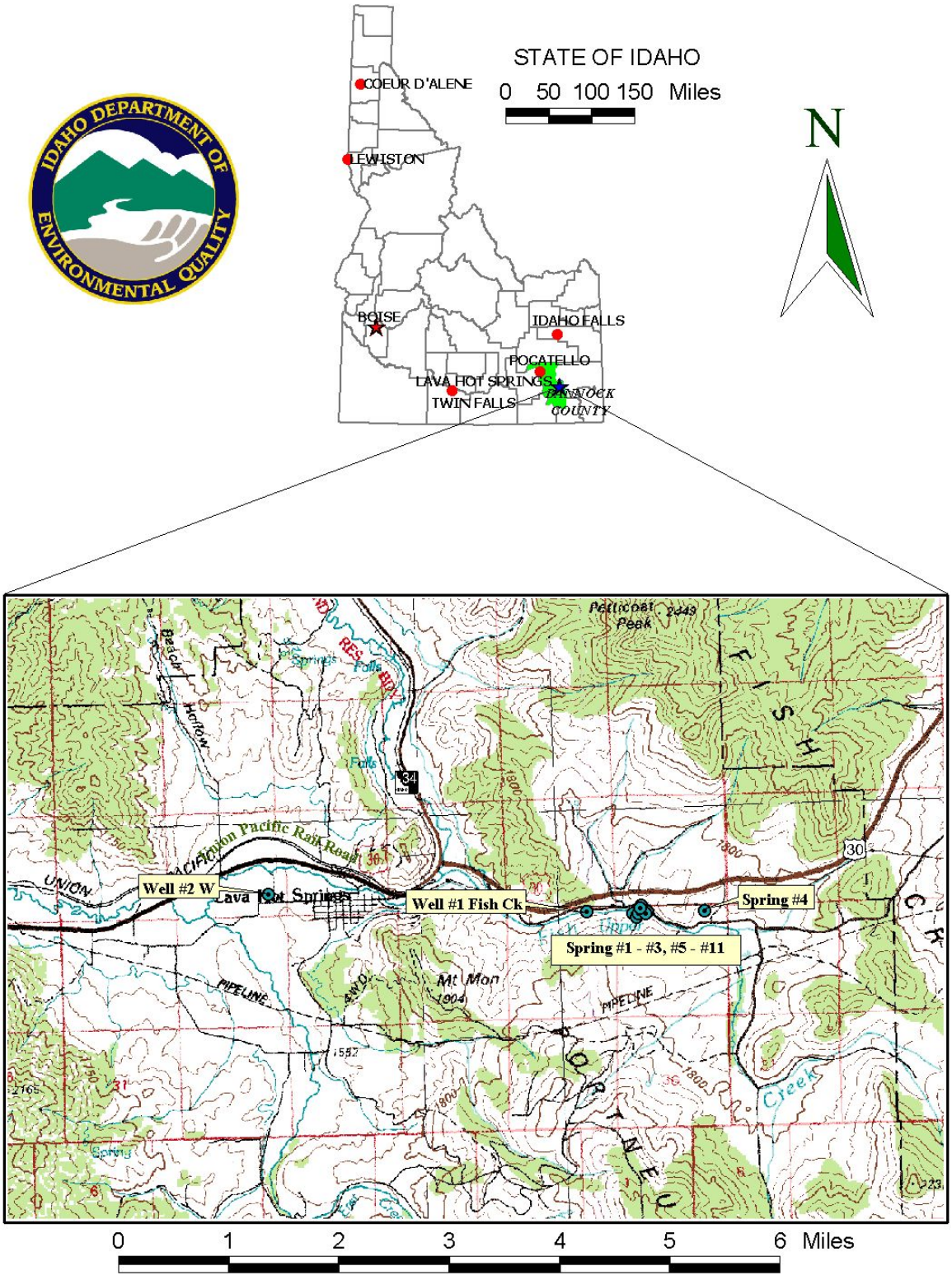


Figure A1. Geographic Location of the City of Lava Hot Springs

FIGURE 2 - City of Lava Hot SpringsDelineation Map and Potential Contaminant Source Locations

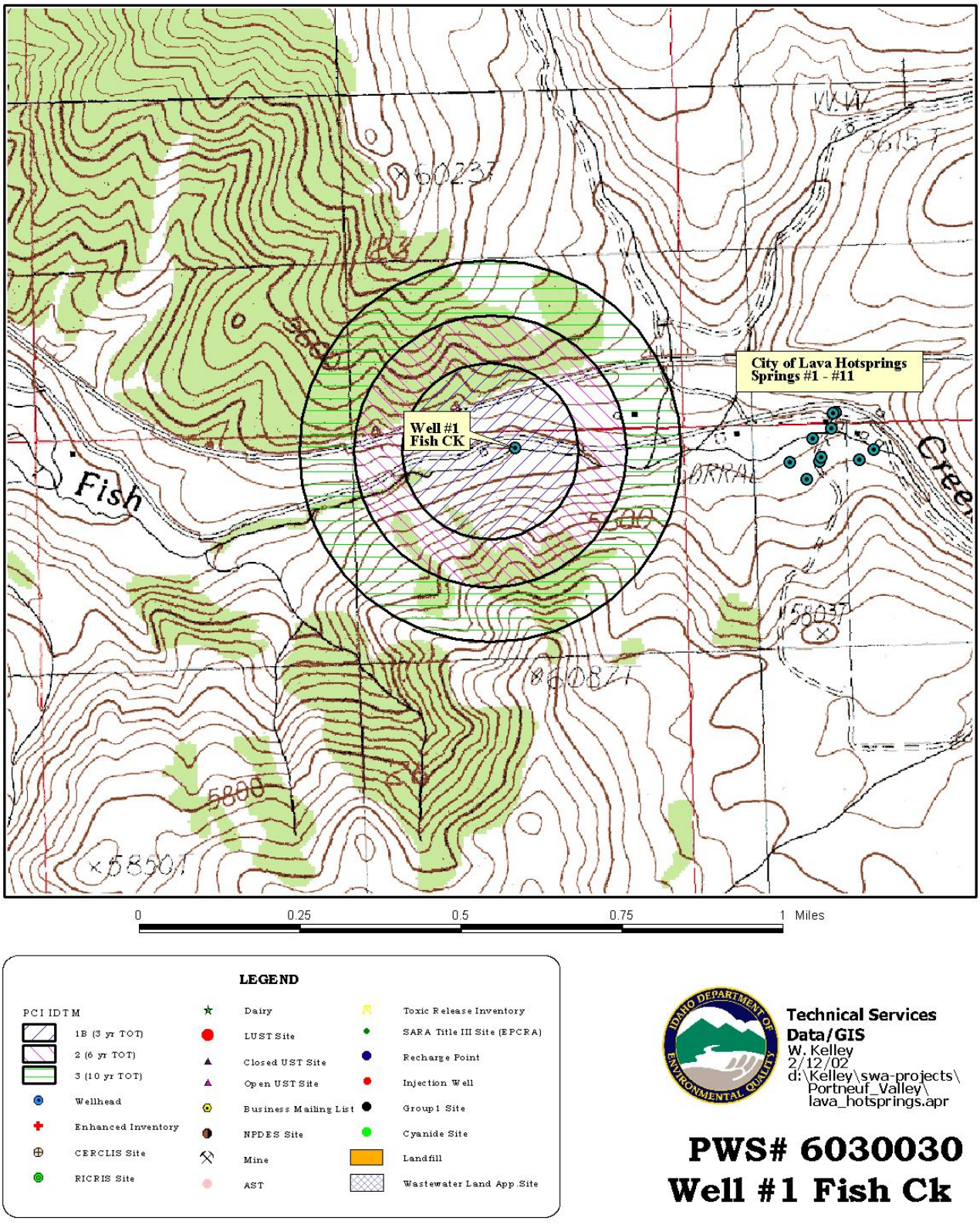


Figure A2. Well #1 Fish Creek Source Water Delineation

FIGURE 3 - City of Lava Hot SpringsDelineation Map and Potential Contaminant Source Locations

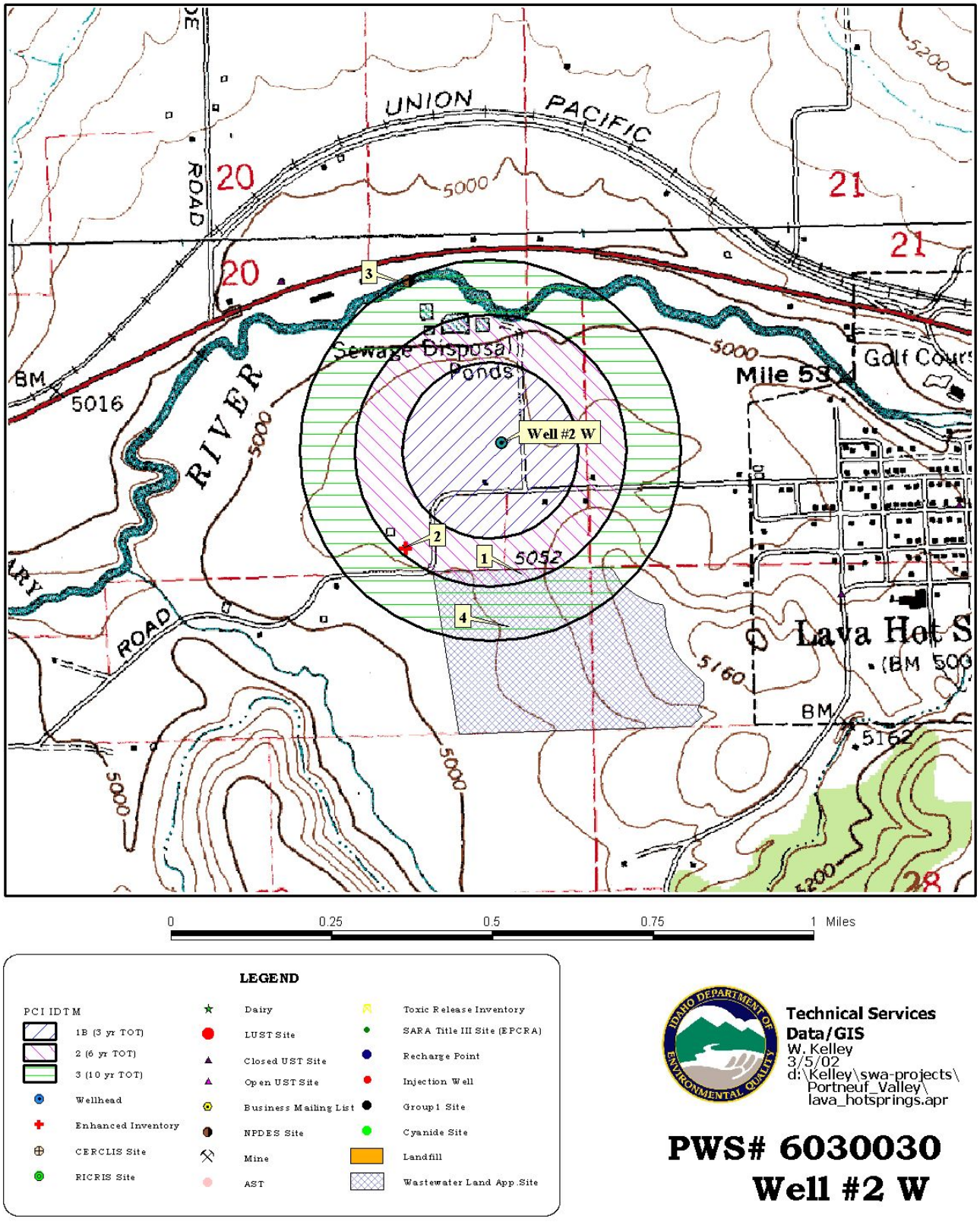


Figure A3. Well #2 W Source Water Delineation

APPENDIX B

Well Documentation

Well #1

WELL LOG AND REPORT TO THE STATE RECLAMATION ENGINEER OF IDAHO

30068

Log No.
Rec. , 19
Well No.
Permit No.
(DO NOT FILL IN)

Owner Lava Hot Springs, Address Lava Idaho
Driller Jack Dix. Address R#3, Basin Id. Lic. No. 31
Location of Well: ¼ ¼ Sec. 21 & 22, T. 9 N/S, R 38 E/W Bannock County,
and feet N/S, and feet E/W from Corner of ¼ ¼ Sec.
Size of Drilled Hole 10" Total depth of Well 225'
Give depth of standing water from surface flowing 10 P.M. Water Temp. °Farenheit
On pumping test delivery was 350 g.p.m. or c.f.s. Drawdown was 100 feet.
Size of pump and motor used to make the test Air Compressor.
Length of time pumped during check was 4 hr., minutes.
If flowing well, give flow in 100 g.p.m. and shut in pressure
If flowing well, describe control works 6" gate Valve. (TYPE AND SIZE OF VALVE, ETC.)
Water will be used for Domestic & Sprinkling. Weight of casing per linear foot
Thickness of casing Casing material Standard weight Pipe. E.G., PIPE, CONCRETE, WOOD
Diameter, length and location of casing 12" 105'8" 10" 163' 8" 71'6" (CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER; CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)
Number and size of perforations ¼" 65 ft. on 4 sides. located 160 feet to 225' feet from surface of ground.
Other perforations 30 ft. in 12" pipe. 52' to 82' ft.
Date of commencement of well Aug 20 / 55 Date of completion of well Oct. 22 / 55
Type of well rig

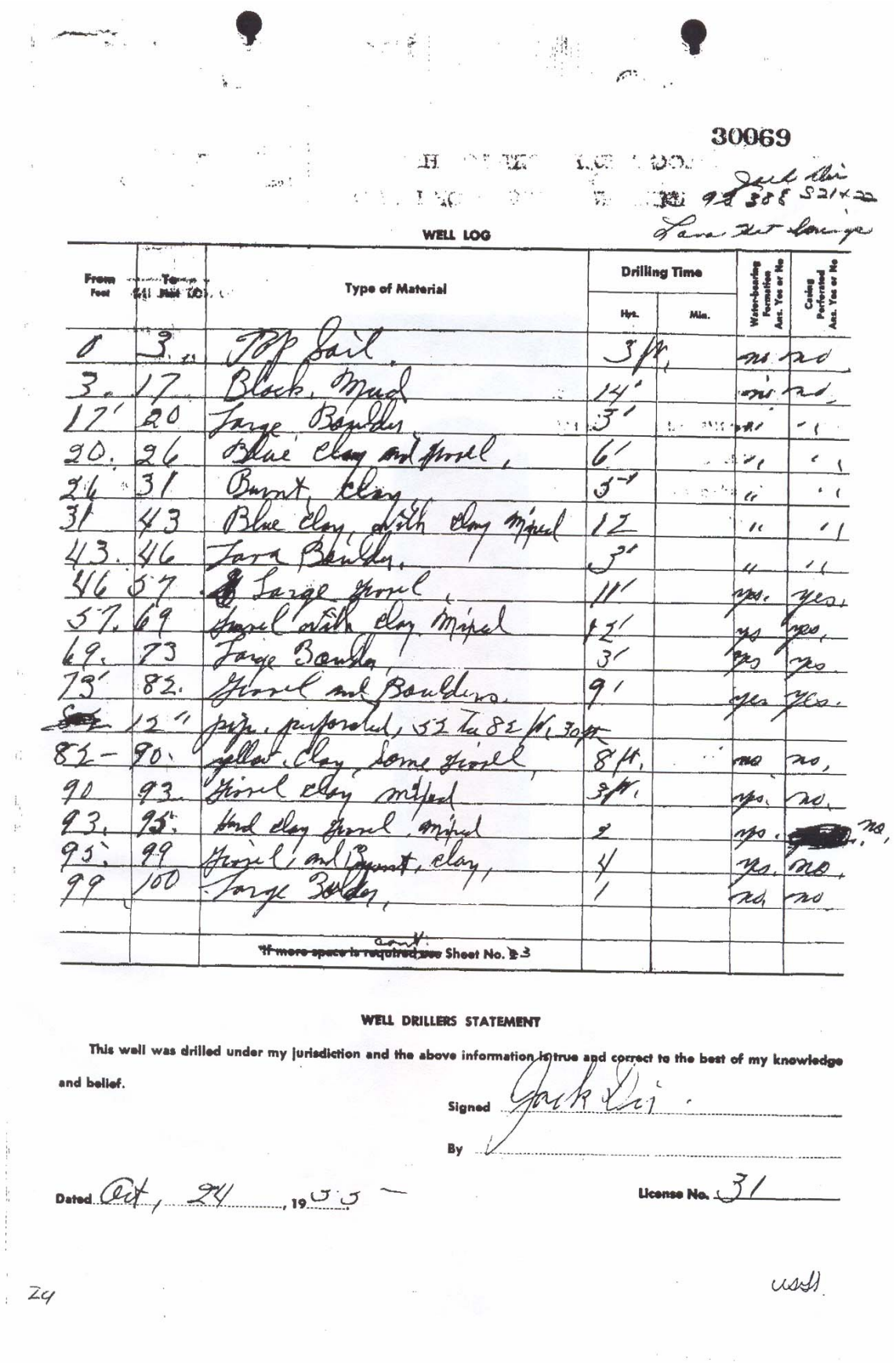
CASING RECORD

DIAM. CASING	FROM FEET	TO FEET	LENGTH	"REMARKS" -- SEALS, GROUTING, ETC.
12"	0	105'8"	105'8"	30 ft. perforated.
10"	0	161'	163'	ab added Pipe. 2 ft. above ground.
8"	153'6"	225'	71'6"	65 ft. perforated.

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

USGS

Figure B1. Well Documentation – Well #1 Fish Creek



30069

WELL LOG

From Feet	To Feet (All Drill To)	Type of Material	Drilling Time Hrs.	Drilling Time Min.	Water-bearing Formation Ans. Yes or No	Casing Perforated Ans. Yes or No
0	3	Top Soil.	3 Hr.		no	no
3	17	Black Mud	14'		no	no
17'	20	Large Boulders	3'		"	"
20	26	Blue clay and gravel,	6'		"	"
26	31	Burnt clay,	5'		"	"
31	43	Blue clay, with clay mixed	12		"	"
43	46	Large Boulders.	3'		"	"
46	57	Large Gravel,	11'		yes	yes
57	69	Gravel with clay Mixed	12'		yes	yes
69	73	Large Boulds	3'		yes	yes
73'	82	Gravel and Boulders.	9'		yes	yes
~~8~~	12"	pipe, perforated, 52 To 82 Ft, 30 Ft				
82	90	yellow Clay, some Gravel	8 Hr.		no	no
90	93	Gravel clay mixed	3 Hr.		yes	no
93	95	Hard clay Gravel mixed	2		yes	[redacted] no
95	99	Gravel and Burnt clay,	4		yes	no
99	100	Large Boulder,	1		no	no
		If more space is required, use Sheet No. 2-3				

WELL DRILLERS STATEMENT

This well was drilled under my jurisdiction and the above information is true and correct to the best of my knowledge and belief.

Signed Jack Lee

By

Dated Oct, 24, 1933 License No. 31

24

Figure B2. Well Documentation – Well #1 Fish Creek (continued)

30070

SHEET NO. 3

Well Driller Jack Dix

Well Location [illegible]

WELL LOG

From Feet	To Feet	Type of Material	Drilling Time Hrs.	Drilling Time Min.	Water-bearing Formation Ans. Yes or No	Casing Perforated Ans. Yes or No
100	103	Large Boulder,	3 ft.		no	no.
103	110	Gravel and clay,	7'		"	"
110	112	Large Boulder,	2'		"	"
113.	116.	Gravel and clay,	4'		"	"
116	118	Large Boulder,	2'		"	"
118	126	Gravel and Brown clay	8'		"	"
126	136	Brown clay with gravel,	10'		"	"
136	147	Lava Bolders, with clay, mixed	11'		"	"
147	160	Bolders, ~~with~~ clay mixed,	13'		"	"
160	179	Lava Rock Crevice	19'		yes	yes.
179	182	Lava Rock, Large crevice,	3		yes	yes.
182	200	Lava Rock with crevice,	18		yes	yes
200	215	Lava Rock, Some crevices.	15		"	"
215	225	Lava Ro[illegible], [illegible]	10		"	"
		Finished well at 225 ft.				

usgs

Figure B3. Well Documentation – Well #1 Fish Creek (continued)

Form 238-7
8/90

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

RECEIVED
NOV 12 1991
Department of Water Resources

1. WELL OWNER
Name CITY OF LAVA HOT SPRINGS
Address LAVA HOT SPRINGS, Id. 83246 PO Box 187
Drilling Permit No. 29-91 E-005
Water Right Permit No. 29-08056

2. NATURE OF WORK
☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase
☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

3. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED
☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION
Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	16 inches	+ 1 feet	34 feet
.250 inches	10 inches	+ 2 feet	505 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☒ Yes ☐ No
How perforated? ☐ Factory ☐ Knife ☒ Torch ☐ Gun
Size of perforation 3/16 inches by 12 inches

Number	From	To
_____ perforations	303 feet	343 feet
_____ perforations	363 feet	403 feet
_____ perforations	443 feet	483 feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter ____ Slot size ____ Set from _____ feet to _____ feet
Diameter ____ Slot size ____ Set from _____ feet to _____ feet
Gravel packed? ☒ Yes ☐ No ☐ Size of gravel 3/8
Placed from 140 feet to 505 feet
Surface seal depth 35 Material used in seal: ☒ Cement grout ☐ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit ☒ ~~Perf.~~ surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port PLUG IN CAP

6. LOCATION OF WELL
Sketch map location must agree with written location.

N / W / E / S

Subdivision Name _____
Lot No. _____ Block No. _____
NOV 20 1991
County BANNOCK
NW ¼ SE ¼ Sec. 10, T. 9 N ☐ S ☒ R. 38 E ☐ W ☐

7. WATER LEVEL
Static water level 76 feet below land surface
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 58 °F. Quality Good
Describe artesian or temperature zones below.

8. WELL TEST DATA
☒ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
100	500	4

9. LITHOLOGIC LOG 022449

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
20"	0	7	overburden		X
"	7	35	Soft brown Clay		
15"	35	82	Sand, gravel, Qtz,		
	82	84	" " boulders		
	84	91	Clay		
	91	94	Broken Qtz.		
	94	106	Clay + Rock		
	106	120	Brown Clay		
	120	298	Brown clay + Gravel Mix		
	298	348	Broken ls mix w/ Qtz, gravel	X	
	348	376	Soft ls.		X
	376	423	Broken Sandstone	X	
	423	438	Med. "		X
	438	463	Broken "		
	463	485	Med. "		
	485	491	Soft "	X	
	491	512	Broken "		X
9⅞	512	522	" "	X	
	522	531	Soft "		X
	531	550	Broken "		
6½	550	540	Soft "		

RECEIVED
NOV - 8 1991
Department of Water Resources
Eastern District Office

10. Work started 8-13-91 finished 9-13-91

11. DRILLERS CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name Nelson Drilling Firm No. 215
Address Soda Springs, Id. Date 10-3-91
Signed by (Firm Official) Ray Nelson
and
(Operator) Wyatt Bar

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Figure B4. Well Documentation - Well #2 W

APPENDIX C

Overview of Potential Contaminant Sources (Ground and Surface Water)

OVERVIEW OF POTENTIAL CONTAMINANT SOURCES

Table C1 provides an overview of potential contaminant sources and the contaminants that may be associated with each source. These sources represent many of the businesses, industries, operations, land uses, and environmental conditions that handle, generate, store, apply, dispose of, or provide a pathway for the contaminants of concern. The sources are separated into four categories:

1) Commercial/Industrial;
2) Agricultural/Rural;
3) Residential/ Municipal, and
4) Miscellaneous;

These sources can apply to either ground water or surface water, and many can apply to both ground and surface water. Where a potential contaminant source generally applies to only ground water or surface water, it is noted within Table C1.

Table C1. Potential Contaminant Sources (Ground and Surface Water)

Source		**Potential Contaminants [1,2,3]**
Commercial/Industrial		
Automobile	Body Shops/ Repair Shops	Waste oils, gasoline and diesel fuels; solvents, acids, paints, automotive wastes[4], miscellaneous cutting oils.
	Car Washes	Soaps, detergents, waxes, miscellaneous chemicals, hydrocarbons.
	Gas Stations	Petroleum fuels, oil, solvents, miscellaneous wastes.
Boat Services/Repair/Refinishing		Gasoline and diesel fuels, oil, septage from boat waste disposal area, wood preservative and treatment chemicals, paints, waxes, varnishes, automotive wastes[4].
Cement/Concrete Plants		Diesel fuel, solvents, oils, miscellaneous wastes.
Chemical/Petroleum Processing/Storage		Hazardous chemicals, solvents, hydrocarbons, heavy metals.
Dry Cleaners		Solvents (tetrachloroethylene, petroleum solvents), spotting chemicals (trichloroethane, methyl chloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate).
Electrical/Electronic Manufacturing		Cyanides, metal sludge, caustic (chromic acid), solvents, oils, alkalis, acids, paints and paint sludges, PCBs.
Fleet/Trucking/Bus Terminals		Waste oil, solvents, gasoline and diesel fuel from vehicles and storage tanks, fuel oil, other automotive wastes[4].
Food Processing		Nitrates, salts, phosphorous, miscellaneous food wastes, chlorine, ammonia, ethylene glycol.

Source	Potential Contaminants [1,2,3]
Furniture Repair/Manufacturing	Paints, solvents, degreasing and solvent recovery sludges, lacquers, sealants.
Hardware/Lumber/Parts Stores	Hazardous chemical products in inventories, heating oil and fork lift fuel from storage tanks, wood-staining and treating products such as creosote, paints, thinners, lacquers, varnishes.
Home Manufacturing	Solvents, paints, glues and other adhesives, waste insulation, lacquers, tars, sealants, epoxy wastes, miscellaneous chemical wastes.
Junk/Scrap/Salvage Yards	Automotive wastes[4], PCB contaminated wastes, any wastes from businesses[5] and households[6], oils, lead.
Machine Shops	Solvents, metals, miscellaneous organics, sludges, oily metal shavings, lubricant and cutting oils, degreasers (tetrachloroethylene), metal marking fluids, mold-release agents.
Metal Plating/Finishing/Fabricating	Sodium and hydrogen cyanide, metallic salts, hydrochloric acid, sulfuric acid, chromic acid, boric acid, paint wastes, heavy metals, plating wastes, oils, solvents.
Mines/Gravel Pits	Mine spills or tailings that often contain metals, acids, highly corrosive mineralized waters, metal sulfides, metals, acids, minerals sulfides, other hazardous and nonhazardous chemicals, petroleum products and fuels.
Photo Processing/Printing	Biosludges, silver sludges, cyanides, miscellaneous sludges, solvents, inks, dyes, oils, photographic chemicals.
Plastics/Synthetics Producers	Solvents, oils, miscellaneous organic and inorganics (phenols, resins), paint wastes, cyanides, acids, alkalis, wastewater treatment sludges, cellulose esters, surfactant, glycols, phenols, peroxides, etc.
Research/University/Hospital Laboratories	X-ray developers and fixers[7], infectious wastes, radiological wastes, biological wastes, disinfectants, asbestos, beryllium, solvents, infectious materials, drugs, disinfectants, miscellaneous chemicals.
Wood Preserving/Treating	Wood preservatives: creosote, pentachlorophenol, arsenic, heavy metals.
Wood/Pulp/Paper Processing and Mills	Metals, acids, sulfides, other hazardous and nonhazardous chemicals, organic sludges, sodium hydroxide, chlorine, hypochlorite, chlorine dioxide, hydrogen peroxide, methanol, paint sludges, solvents, creosote, coating and gluing wastes.

Source	Potential Contaminants [1,2,3]
Agricultural/Rural	
Livestock Auction Lots/Boarding Stables	Nitrates, phosphorous, bacteria, and viruses, total dissolved solids.
Confined Animal Feeding Operations Slaughter House and Butcher Facilities	Nitrates, phosphorous, chloride, chemical sprays and dips for controlling insect, bacteria and viruses, total dissolved solids.
Farm Machinery Repair	Automotive wastes[4], solvents, fuel.
Crops - Irrigated and Non-irrigated	Pesticides[8], nitrate & phosphorous (from fertilizers), salts, sediment (from runoff).
Wastewater/Sludge/Manure Land Application or Disposal Locations	Nitrates, metals, salts, bacteria and viruses.
Lagoons/Liquid Wastes	Nitrates, livestock sewage wastes, salts, bacteria.
Pesticide/Fertilizer/Petroleum Storage & Transfer Areas	Pesticides[8], nitrate, phosphorous, petroleum residues.
Residential/Municipal	
Airports (Maintenance/Fueling Areas)	Aviation fuels, deicers, diesel fuel, chlorinated solvents, automotive wastes[4], heating oil, building wastes[5].
Camp Grounds/RV Parks, Marinas	Septage, gasoline, diesel fuel from boats, pesticides[8], household hazardous wastes from recreational vehicles (RVs)[6].
Drinking Water Treatment plants	Treatment chemicals.
Golf Courses	Pesticides[8], nitrate, phosphorous, arsenic.
Landfills/Dumps	Organic and inorganic chemical contaminants; waste from households[6] and businesses[5], nitrates, oils, metals, solvents.
Motor Pools	Automotive wastes[4]: solvents, waste oils, fuel storage.
Railroad Yards/Maintenance/Fueling Areas	Diesel fuel; herbicides for rights-of-way[8], creosote from preserving wood ties, solvents, paints, waste oils.
School Maintenance Facilities	Machinery/vehicle serving wastes, gasoline.[4].
Septic Systems (large community systems or 10 single systems on 40 acres)	Bacteria, viruses, nitrates, salts, dissolved solids, improperly disposed of household or business wastes[5,6,9].
Utility Stations/Maintenance Areas	PCBs from transformers and capacitors, oils, solvents, sludges, acid solution, metal plating solutions (chromium, nickel, cadmium).

Source	Potential Contaminants [1,2,3]
Waste Transfer/Recycling Stations	Residential and commercial solid waste residues.
Wastewater Effluent to Surface Waters (primarily surface water concern)	Municipal wastewater, sludge[10], treatment chemicals[11], nitrates, heavy metals, bacteria, nonhazardous wastes.
Miscellaneous	
Above Ground Storage Tanks	Diesel, gasoline, other chemicals.
Construction/Demolition Areas (Plumbing, Heating, and Air Conditioning, Painting, Carpentry, Flooring, Roofing and Sheet Metal etc.)	Solvents, asbestos, paints, glues and other adhesives, wastes insulation, lacquers, tars, sealants, epoxy waste, miscellaneous chemical wastes, explosives, sediment.
Historic Gas Stations	Diesel fuel, gasoline, kerosene.
Historic Waste Dumps/Landfills	Leachate, organic and inorganic chemicals, waste from households[6], and businesses[5], nitrates, oils, heavy metals, solvents.
Injection Wells/Dry Wells/Sumps (primarily ground water concern)	Storm water runoff, used oils, antifreeze, gasoline, solvents, other petroleum products, pesticides[8], and other chemical substances.
Storm Water Drainage to Surface Waters (primarily surface water concern)	Storm water runoff, oils, antifreeze, metals, sediment, and pesticides, and a wide variety of other substances.
Military Installations	Wide variety of hazardous and nonhazardous wastes depending on the nature of the facility, diesel fuels, jet fuels, solvents, paints, waste oils, heavy metals, radioactive wastes, explosives.
Surface Water - Stream/Lakes/Rivers/Recharge Sites	Ground Water: bacteria and viruses, cryptosporidium. Surface Water: nitrates, pesticides, sediment from Ag. return drains.
Transportation Corridors	Herbicides in highway right-of-way[8], road salt (sodium and calcium chloride), road salt anti-corrosives (phosphate and sodium ferrocyanide), automotive wastes[4], nitrate or phosphorous from fertilizer use.
Forest Roads /Logging (primarily surface water concern)	Sediment, fuel spills.
Landslides/Burn Areas (primarily surface water concern)	Sediment.
Underground Storage Tanks	Diesel, gasoline, heating oil, other chemical and petroleum products.

Source	Potential Contaminants [1,2,3]
Unsealed or Abandoned Wells, and Test Holes (primarily ground water concern)	Storm water runoff, solvents, nitrates, septic tanks, hydrocarbons, and a wide variety of other substances.

1. In general, surface or ground water contamination stems from the misuse and improper disposal of liquid and solid wastes; the illegal dumping or abandonment of household, commercial, or industrial chemicals; the accidental spilling of chemicals from trucks, railways, aircraft, handling facilities, and storage tanks; or the improper siting, design, construction, operation, or maintenance of agricultural, residential, municipal, commercial, and industrial drinking water wells and liquid and solid waste disposal facilities. Contaminants also can stem from atmospheric pollutants, such as airborne sulfur and nitrogen compounds, which are created by smoke, flue dust, aerosols, and automobile emissions, fall as acid rain, and percolate through the soil. When the sources listed in these tables are used and managed properly, water contamination is not likely to occur.

2. Contaminants can reach ground water from activities occurring on the land surface, such as industrial waste storage; from sources below the land surface but above the water table, such as septic systems; from structures beneath the water table, such as wells; or from contaminated recharge water.

3. This table lists the most common potential contaminants, but not all-potential contaminants. For example, it is not possible to list all potential contaminants contained in storm water runoff or from military installations.

4. Automobile wastes can include gasoline; antifreeze; automatic transmission fluid; battery acid; engine and radiator flushes; engine and metal degreasers; hydraulic (brake) fluid; and motor oils.

5. Common wastes from public and commercial buildings include automotive wastes; and residues from cleaning products that may contain chemicals such a xylenols, glycol esters, isopropanol, 1, 1, 1, -trichloroethane, sulfonates, chlorinated phenols, and cresol.

6. Households wastes include common household products that can contain a wide variety of toxic or hazardous components.

7. X-ray developers and fixers may contain reclaimable silver, glutaldehyde, hydroquinone, potassium bromide, sodium sulfite, sodium carbonate, thiosulfates, and potassium alum.

8. Pesticides include herbicides, insecticides, rodenticides, and fungicide. EPA has registered approximately 50,000 different pesticide products for use in the United States. Many are highly toxic and quite mobile in the subsurface.

9. Septic tank/cesspool cleaners include synthetic organic chemicals such as 1, 1, 1,-trichloroethane, tetrachloroethylene, carbon tetrachlorine, and methylene chloride.

10. Municipal wastewater treatment sludge can contain organic matter, nitrates; inorganic salts; heavy metals; coliform and noncoliform bacteria; and viruses.

11. Municipal wastewater treatment chemicals include calcium oxide; alum; activated alum; polymers; ion exchange resins; sodium hydroxide; chlorine; ozone; and corrosion inhibitors.

Source: Adapted from EPA (1993).

APPENDIX D

Drinking Water Protection Ordinance Template (Example)

- Example -
Drinking Water Protection Ordinance

SECTION 1. **Short Title and Purpose**.

A. This ordinance shall be known as the **"Drinking Water Protection Plan"**.

B. It is the purpose of this ordinance to promote the public health, safety, and general welfare and to minimize public and private loses due to contamination of the public water supply, and to formalize ground water protection/pollution abatement and control procedures. Specific goals are to:

1. Protect human life and health;

2. Insure that the public is provided with a sustainable safe potable water supply;

3. Minimize expenditure of public money for pollution remediation projects;

4. Minimize regulations on land use, and

5. Minimize business interruptions.

SECTION 2. **Definitions**. When used in this ordinance, the following words and phrases shall have the meanings given in this section:

A. **Agricultural Runoff Waste Water**. Water diverted for irrigation but not applied to cropland, or runoff of irrigation tail water from the cropland as a result of irrigation.

B. **Aquifer Remediation Related Wells**. These wells shall include those used to prevent, control, or remediate aquifer pollution, including--but not limited to--Superfund sites.

C. **Community Water System**. A public water system which serves at least fifteen (15) service connections used by year-round residents, or regularly serves at least twenty-five (25) year-round residents.

D. **Facility**. Refers to any business or corporation that is built, installed or established to serve a particular purpose.

E. **Hazardous Waste Disposal Facility**. A hazardous waste treatment, storage, or disposal facility which receives hazardous material as described in Part 40 Chapter 260.1 of the Code of Federal Regulations.

F. **Hazardous Waste or Material**. Any waste or material which, because of its quantity, concentration, physical, chemical or infectious characteristics may:

1. Cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or

2. Pose a substantial present or potential hazard to human health or to the environment when

improperly treated, stored, transported, disposed of or otherwise managed; or

3. Any material or substance designated as a hazardous or toxic substance defined by Title 40 Part 261.3 of the Code of Federal Regulations, or any material or substance designated as a hazardous or toxic substance by the State of Idaho, acting through the DEQ or any successor agency.

G. **Injection**. The sub-surface emplacement of fluids.

H. **Livestock Confinement Operation**. As defined elsewhere in the Code.

I. **Non-Community Water System**. A public water system that is not a community water system.

J. **Public Water System**. A system that provides the public with piped water for human consumption, if such system has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year. Such term includes:

1. Any collection, treatment, storage, and distribution facilities under control of the operator of such system, and used primarily in connection with such system; and

2. Any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system.

A public water system is either a "community water system" or a "non-community water system."

K. **Sanitary Landfill**. A solid waste disposal operation where the wastes are spread on land in thin layers, compacted to the smallest practical volume, and covered with cover material once each day of operation in order to safeguard against environmental pollution, nuisances, and health hazards.

L. **Special Drainage Wells.** Used for disposing of water from sources other than direct precipitation. Examples of this well type include: landslide control drainage wells, potable water tank overflow drainage wells, swimming pool drainage wells, and lake level control drainage wells.

M. **Storm Water Runoff**. Water discharged as a result of rain, snow, or other precipitation.

N. **Time of Travel Districts (TOT)**. The time required for ground water to move from a specific point to a well.

O. **Underground Injection Well**. Any excavation or artificial opening into the ground which meets the following three criteria:

1. A bored, drilled or dug hole, or a driven mine shaft, or a driven well point; and

2. It is deeper than its largest straight-line surface dimension; and

3. It is used for or intended to be used for injection.

P. **Drinking Water Protection Overlay District (DWP)**. A land use designation on the Land Use Map, or a zoning designation on a zoning map, that modifies the basic underlying designation in some specific manner. The Drinking Water Protection Overlay District will also appear in the Hazardous Component of the Comprehensive Plan. A map will define specific area districts centering on wells supplying drinking water to a public water system. The map is delineated using one of the following methods:

1. Calculated Fixed Radius;

2. Arbitrary Fixed Radius;

3. Simplified Variable Shapes;

4. Semi-analytical, and Analytical Methods;

5. Hydrogeologic Mapping;

6. Numerical Modeling; and

and following the guidelines established in the Idaho Wellhead Protection Plan.

Q. **Community Wellhead**. The upper terminal of a well including adapters, ports, seals, valves and other attachments.

R. **Drinking Water Protection Overlay District IA**. A minimum fixed radius extending no less than fifty (50) feet radially from the wellhead supplying potable water to the public water supply(s).

S. **Drinking Water Protection Overlay District IB**. A three (3) year time of travel district (TOT) as defined in Section 2.

T. **Drinking Water Protection Overlay District II**. A six (6) year time of travel district (TOT) as defined in Section 2.

U. **Drinking Water Protection Overlay District III**. A ten (10) year time of travel district (TOT) as defined in Section 2.

SECTION 3. **Establishment of Drinking Water Protection Overlay District**. There is hereby established a drinking water protection overlay district identified and described as all the area within the ten (10) year TOT district around public water supplies as shown on the official zoning map. It is further established that these areas be composed of four(4) districts; Drinking Water Protection Overlay District IA, Drinking Water Protection Overlay District IB, Drinking Water Protection Overlay District II, and Drinking Water Protection Overlay District III as they are defined in this Chapter. The Board of Commissioners may record with the County Recorder's Office a metes and bounds description of the Drinking Water Protection Overlay District.

SECTION 4. **Prohibited uses within Zone IA of the Drinking Water Protection Area**. Uses permitted within Zone IA shall be limited to necessary public water supply wellhead equipment

including the following, wellhead facility buildings, water storage tanks, disinfection equipment, disinfection chemical storage and approved landscaping. All other uses shall be prohibited.

SECTION 5. **Prohibited uses within Zone IB of the Drinking Water Protection Area**. The following uses or conditions shall be and are hereby prohibited within Zone IB of the Drinking Water Protection Areas:

A. Sanitary landfills;

B. Livestock Confinement Operations;

C. Hazardous waste Disposal Facility;

D. Injection well is a prohibited use ***except for the following***:

1. Closed systems.

E. Existing sewer lines shall not be closer than one hundred (100) feet of a wellhead or of new sanitary system and sewer lines shall not be closer than one hundred fifty (150) feet of a wellhead;

F. Existing septic tanks or drain fields shall not be closer than one hundred (100) feet of a wellhead and new installation of septic tanks or drain fields shall not be closer than two hundred (200) feet away from the wellhead;

G. Junk or salvage yards;

H. Disposal of waste oil, oil filters, tires and all other petroleum products; and

I. All manufacturing or industrial businesses involving the collection, handling, manufacture, use, storage, transfer or disposal of any hazardous solid or liquid material or waste having a potential impact on groundwater, and any land use activities posing a hazard or threat to existing ground water quality, except upon issuance of a Special Use Permit. The Special Use Permit process may be instigated by the Zoning Administrator during the application review process.

SECTION 6. **Prohibited Uses within Zone II of the Drinking Water Protection Area**. The following uses or conditions shall be and are prohibited within Zone II of the Drinking Water Protection Area:

A. Sanitary landfills;

B. Hazardous Waste Disposal Facility;

C. Injection well is a prohibited use ***except for the following***:

1. Deep well injection (below 18 feet in depth):

a. Geothermal Heat;

b. Heat Pump Return; and

c. Cooling Water Return.

2. Shallow well injection only (less than 18 feet in depth), including:

a. Storm Runoff;

b. Agricultural Runoff Waste Water;

c. Special Drainage Water;

d. Aquifer Recharge;

e. Aquifer Remediation; and

f. Septic Systems (General).

D. All manufacturing or industrial businesses involving the collection, handling, manufacture, use, storage, transfer or disposal of any hazardous solid or liquid material or waste having potential impact on groundwater, and any land use activities posing a hazard or threat to existing ground water quality, except upon issuance of a Special Use Permit. The Special Use Permit process may be instigated by the Zoning Administrator during the application review process.

SECTION 7. **Prohibited Uses within Zone III of the Drinking Water Protection Area**. The following uses or conditions shall be and are prohibited within Zone III of the Drinking Water Protection area:

A. Injection well is a prohibited use ***except for the following***:

1. Deep well injection (below 18 feet in depth):

a. Geothermal Heat;

b. Heat Pump Return; and

c. Cooling Water Return.

2. Shallow well injection only (less than 18 feet in depth):

a. Storm Runoff;

b. Agricultural Runoff Waste Water;

c. Special Drainage Water;

d. Aquifer Recharge;

e. Aquifer Remediation; and

f. Septic Systems (General).

B. All manufacturing or industrial businesses involving the collection, handling, manufacture, use,

storage, transfer or disposal of any hazardous solid or liquid material or waste having potential impact on groundwater, and any land use activities posing a hazard or threat to existing ground water quality, except upon issuance of a Special Use Permit. The Special Use Permit process may be instigated by the Zoning Administrator during the application review process.

SECTION 8. **Notice of Proposed Action to Operator of Public or Community Water Supply**. Whenever there is a request which requires a Special Use Permit from the Planning and Zoning Commission for land lying within a Drinking Water Protection District, written notice of the hearing shall be given to the entity operating the public or community water supply within that overlay district. The Planning and Zoning Commission may require a granting of easements for monitoring wells if the commission deems it appropriate for protection of the public water supply.

SECTION 9. **Non-Conforming Uses**. Any legal use existing at the time of the adoption of this ordinance and listed as a prohibited use herein, shall become a legal non-conforming use and may not be expanded or improved except as otherwise provided in the zoning ordinance.

SECTION 10. **Enforcement**. It shall be unlawful for any person, corporation, government entity or business to occupy or use the land within the area designated in the Drinking Water Protection Overlay District of Zone IA and IB, II, and III contrary to, or in violation of, any of the provisions of this Chapter.

SECTION 11. **Amendments**. Proposed amendments will require advance notice to all entities operating public or community water supplies that this ordinance effects.

APPENDIX E

Contingency Plan

City of Lava Hot Springs

P.O. Box 178
Lava Hot Springs, ID 83246

I. INTRODUCTION

The purpose of contingency planning is to establish, provide and keep updated certain emergency response procedures which may become necessary in the event of a partial or total loss of public water supply service as a result of natural disasters, chemical contamination, mechanical failure, or civil disorders. This Contingency Plan is the procedural guide for responding to such emergencies. This Plan is coordinated with the Idaho Department of Environmental Quality.

Regardless of protection strategies and efforts to prevent contamination or exposure of the municipal water system to harmful materials, it is recognized that contamination may still occur, either from accidental chemical release, intentional acts of vandalism, or as unforeseen results of the otherwise legal use of hazardous materials. To that end, the Community Planning Team has established this Contingency Plan as a strategy guide for emergency actions should such an incident occur. The Plan is developed on the premise that accidental chemical releases or leaching of agricultural chemicals are the most likely serious threat. However, the provisions of this Contingency Plan may be employed in any event that poses a threat to the municipal drinking water system. If deemed of sufficient severity, the Mayor may declare a state of emergency or disaster under the provisions of Idaho Code Chapter 10, Title 46, Idaho Emergency Preparedness Act in order to request resource and support assistance from Bannock County, the State of Idaho, and/or federal agency sources.

II. HAZARD ANALYSIS/RISK ASSESSMENT

The Community Planning Team has conducted an initial hazard analysis and risk assessment. Derived through discussion, historical occurrence and review of available statistical reports, the Community Planning Team has assigned a priority class to each identified hazard/threat, and a probability rating. Outcome of the process indicates that the most likely and most significant threat to the existing municipal water supply is unintentional contamination through agricultural chemicals or livestock operations, and chemical contamination from a transportation accident or incident on U.S. Highway 30 or Bannock County roads near wells or the spring complex. The following table illustrates contamination sources considered.

Table E1. Threats/Hazards Considered

Priority	Threat/Hazard	Highly Probable	Probable	Possible	Possible but Unlikely
1	Agricultural Chemical Leaching		**X**		
2	Chemical Spill – Transportation Related		**X**		
3	Chemical Spill – Accidental/Residential			**X**	
4	Intentional Contamination – Vandalism or Terrorism			**X**	
5	Natural Contamination (Natural Sources)				**X**
6	Intentional Contamination or Criminal Act			**X**	

III. PUBLIC WATER SUPPLY CHARACTERISTICS

General: The Lava Hot Springs Municipal Water System consists of two 400,000 gallon reservoirs located on the south side of the City. The reservoirs store the City's drinking water supply from various sources. The primary source is a series of buried spring collectors in the Fish Creek area east of town. The springs feed to a common collector box along Fish Creek and are fed to the well house further down the Fish Creek drainage. A chlorinating system and well are located at the well house, where well water and spring water are chlorinated prior to transport to the reservoirs. The system also employs a well (Well #2) located west of town along Maughan Road. A third well (Well #3) is located in the City on North 4th West, however due to mineral content, Well #3 is used for park watering and fire fighting purposes only, and is not available for domestic use. The municipal water distribution system and firewater (hydrant) distribution system are a single, common system.

Table E2. Water System Characteristics

Storage	800,000 gallons (sufficient to supply **7** days or more domestic use without outside watering
Drinking Water Supply Source	Fish Creek Spring Complex (Springs 1,2,3,4,5,6) and Well #1 and #2
Treatment Method	Chlorination through chlorine liquid injection
People Served	540 primary population; 1,000 people average seasonal population
Distribution Method	System is pressurized through gravity flow

Table E3. Water System Source Characteristics

Specifications	Well #1 Fish Creek	Well #2 Maughan Road	Spring 1 Fish Creek	Spring 2 Fish Creek	Spring 3 Fish Creek	Spring 4 Fish Creek	Spring 5 Fish Creek	Spring 6 Fish Creek
Source Capacity gpm)	350	100						
Source Depth	Unknown	500						
Total Depth	225	560	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Production (gpm)	350	100						

IV. CONTINGENCY PLAN – CONCEPT OF OPERATION

Upon notification of an emergency or other event that impacts or threatens to impact the municipal water system, the City Maintenance Supervisor and City Mayor will be notified immediately. The City Maintenance Supervisor will serve as the lead coordinator for mitigation or redemption efforts. A representative of the City will participate in unified command structure to assist in managing and mitigating the emergency incident.

A. CHEMICAL RELEASE ACTION STEPS

The following emergency action guide will be implemented in the event of a chemical release or spill that may threaten any portion of the water supply system:

1. EMERGENCY ACTION STEPS:

Appendix A of this Contingency Plan establishes a one-page Emergency Action Guide that should be implemented immediately upon discovery of a chemical spill or other event that threatens a municipal water source. The "flow-chart" style Emergency Action Guide considers the best protective steps to maintain system integrity is to isolate, and then investigate further. It **MUST** be understood, however,

that no one should enter into a hazardous environment unless properly trained and equipped to do so. Actions should be taken using the Idaho Hazardous Materials Response Plan and the Department of Transportation (DOT) Guidebook to determine exclusion zones and protective actions.

- If not already established by emergency response agencies, an Incident Command System (ICS) will be established. If ICS is already established, the City Maintenance Supervisor and/or Mayor will coordinate and maintain liaison with the Incident Commander to assess threat and implement water system protection measures.
- If not already done by the Incident Commander, Idaho State Communications Center (State Com) will be notified of the chemical release (1-800-632-8000).
- Working with the Mayor, City Council and City Clerk, public notifications, water usage restrictions, and use priority protocol will be implemented as necessary.
- The Maintenance Supervisor will initiate system source isolation (e.g. shutting down wells, isolating spring sources, etc.) as determined appropriate for the event.
- Idaho Department of Environmental Quality (DEQ) Southeast Idaho District Health, and the Idaho Department of Water Resources (IDWR) will be consulted and coordinated with to ensure mediation and safety of delivered drinking water.
- If the event so impacts the water system as to be unusable, the need to supply supplemental drinking water (bottled water, etc.) will be assessed and determined by the City leadership. If the need is beyond the scope or capability of the City, the Mayor will declare a state of emergency.
- In keeping with the County Emergency Operations Plan, the County Office of Emergency Management and the Bureau of Disaster Services Southeast Area Field Officer (BDS AFO) will be notified. In the event that needed resources are not available within the County, the County Emergency Manager and BDS AFO will work through the State Emergency Operations Center to facilitate resource requests.

2. PRIORITY OF USERS DURING WATER SUPPLY EMERGENCIES

During periods of water system emergencies, priorities of use may be established depending upon the severity and anticipated duration of the emergency. Those services and uses determined less critical to public health and safety will be suspended for a period to be determined by City government. This Contingency Plan is developed to pre-plan the management of a water system emergency, and shall not be deemed to contravene the authority of the City governmental leadership. It is recognized the City government may exercise its authority and impose other more or less restrictive controls, based upon the particular event. **Water storage values provided in Table E2 do not include water needed for fire suppression.**

The following priority of use will be established:

Table E4. Water Restrictions and Priority Use during Emergency Conditions

WATER RESTRICTIONS AND USE PRIORITY			
	Use Advisory	**Priority Use**	**Prohibited Use**
Level 1: Minor contaminants – follow Health District recommendations	Boil Order	Drinking Water Firefighting Yard and other uses	Boil Order for domestic uses No restrictions
Level 2: Reduced supply due to source closure or limitation (including drought)	Watering Restriction Notice	Drinking Water Firefighting Limited yard and other uses	Yard or garden use by scheduled watering hours **ONLY**

Level 3: Reduced supply due to source closure limitation (including drought)	Watering Restriction Notice	Drinking Water Firefighting	**NO OUTSIDE WATER USE**
Level 4: Serious health hazard affecting reservoir	Bottled Water **ONLY** All media outlets	Firefighting **ONLY**	**NO DOMESTIC USE**
Level 5: Serious environmental and health hazard, affecting reservoir	Bottled Water **ONLY** No contact with water All media outlets	**NO USE ALLOWED**	**ANY USE OR CONTACT PROHIBITED**

V. SHORT-TERM REPLACEMENT ALTERNATIVES

A. In the event it becomes necessary to isolate the Fish Creek sources (Springs and Well #1), reservoir storage can be supplemented by Well #2 for a short period of time. However, due to limited volume, that source will not adequately replace normal City needs. Such a strategy would have to be supplemented with water use restrictions and other source supplementation. The City would work through the Southeast District Health Department to identify certified shippers who could be contacted to haul potable water by truck and supplement the reservoir storage.

B. Depending upon the anticipated duration of the event, the City may request support from the Idaho National Guard Potable Water Transportation Purification Unit at Boise. Such requests must be made through the Idaho Bureau of Disaster Services (BDS) and can be fulfilled by contacting the Bannock County Emergency Services Department or the Idaho BDS Area Field Officer by contacting State Communications at 1-800-632-8000.

C. The City may have to identify and contract commercial water purification specialist companies to provide short or long-term water purification services until the problem can be remedied.

VI. INVENTORY OF AVAILABLE RESOURCES FOR EMERGENCY USE

A. Locally Available Resources:

Shawn's Market – Bottled water (limited supply)
Culligan Water Company – Bottled water and filtration service
Snake River Sanitation – Certified Drinking Water Hauler
518 West Highway 39
Blackfoot, ID 83221
(208) 785-4868

B. State assets available through the Idaho Bureau of Disaster Services

Idaho National Guard potable water tanks – transportable
Idaho National Guard – Water Purification System – transportable

(The following State resources are available to assist and may be contacted via State Communication at 1-800-632-8000).

C. Region 5 Hazardous Materials Response Team

D. Southeast District Health

E. Idaho Department of Environmental Quality, Pocatello Regional Office

F. Construction Equipment:

- Back Hoe and Truck
  - Marshal Burgin (208) 776-5570
  - Kit Tillotson Construction (208) 776-5829
  - Hall Excavation (208) 776- 5540 or Cellular (208) 251-3488

G. Chemical Spill Control (Booms, absorbent pads, etc.)

- NORCO, Pocatello

VII. LOCAL INCIDENT ASSESSMENT TEAM

Upon notification of a water system emergency, and as soon as possible, an Incident Assessment Team will be assembled to assess impact to the water system, long-range outlook, and alternatives for rectifying the situation. The Team will also advise City government on recommendations concerning public health and meeting immediate needs of the population. The Team will include, but may not be limited to, those positions identified in the table below:

Table E5. Local Incident Assessment Team

Local Incident Assessment Team	
City Government	City Mayor
City Government	Council Person with Water System oversight
System Specialist	City Maintenance Supervisor
Environmental Oversight/Regulatory	Idaho Department of Environmental Quality
Water Permitting/Advisory/Regulatory	Idaho Department of Water Resources
Public Health	Southeast Idaho Health District
Engineering Specialist	TBD as needed

VIII. PUBLIC ANNOUNCEMENT PLAN

A. PUBLIC NOTIFICATIONS: Upon notification of an incident impacting the municipal water system, and upon recommendation from the Maintenance Supervisor, regulatory agencies or other relevant sources, the Mayor and/or City Council will order the appropriate level of public notification to be made. The provisions of this Plan will guide the level of notification used, however, the particular threat or seriousness of impact shall be the deciding factor as to the level and method of public notification.

B. MEDIA OUTLETS: Depending upon the nature of the threat, the severity and seriousness of potential public health implications, the City leadership will decide upon a method to disseminate of public notification. The Southeast District Health Department and its Health Alert Network (HAN) should not be overlooked as a resource for notification, and special expertise in dealing with media information issues. The following are notification methods and media outlets that may be employed at the discretion of City leaders:

1. Mailers and posted public announcements
   - Utility Bill mailers

- Special Announcement mailers
- Public Announcements posted throughout the City

2. Local and area newspapers
   - Lava News (monthly)
   - Idaho State Journal (daily)

3. Broadcast media (Public Service Announcements)
   - KWIK Radio
   - KSEI Radio
   - KIDK TV Channel 3
   - KIFI TV Channel 8
   - KPVI TV Channel 6

4. Bannock County REVERSE 911 SYSTEM
   Available through Bannock County Sheriff's Department (208) 236-7111 or (208) 236-7114

5. Idaho Emergency Alert System (For immediate public health and safety)
   - Central Activation Center (CAC)
   - Idaho State Communications Center 1-800-632-8000
   - National Weather Service NOAA Weather Radio (NWR)
     - Automatically included via EAS Activation
   - All LOCAL Broadcast Media
     - Automatically included via EAS Activation

EMERGENCY ACTION GUIDE
Well Head Protection Plan

If a hazardous chemical incident occurs in the Drinking Water Protection Area and is likely to pose a threat to drinking water sources (springs, wells or reservoir), implement the emergency action steps below immediately.

IMPORTANT: Remain up hill and upwind of any chemical release area. Coordinate with the Incident Commander of emergency response agencies and provide assistance relative to protecting the municipal water sources. Activate the Idaho Emergency Response Plan by contacting State Comm at:

1-800-632-8000

EMERGENCY ACTION STEPS

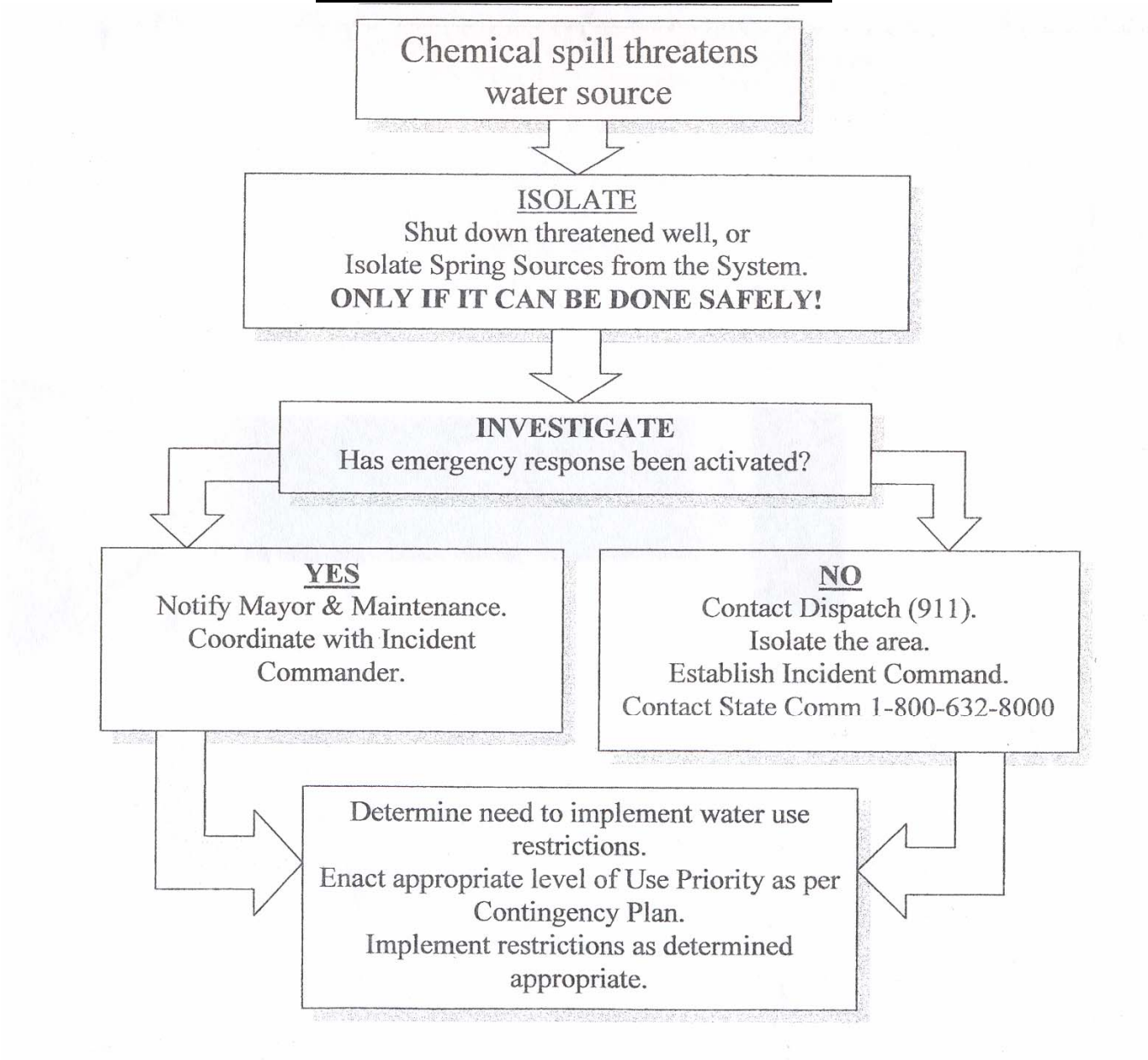


Figure E1. Emergency Action Guide

APPENDIX F

Idaho Emergency Response Flow Chart

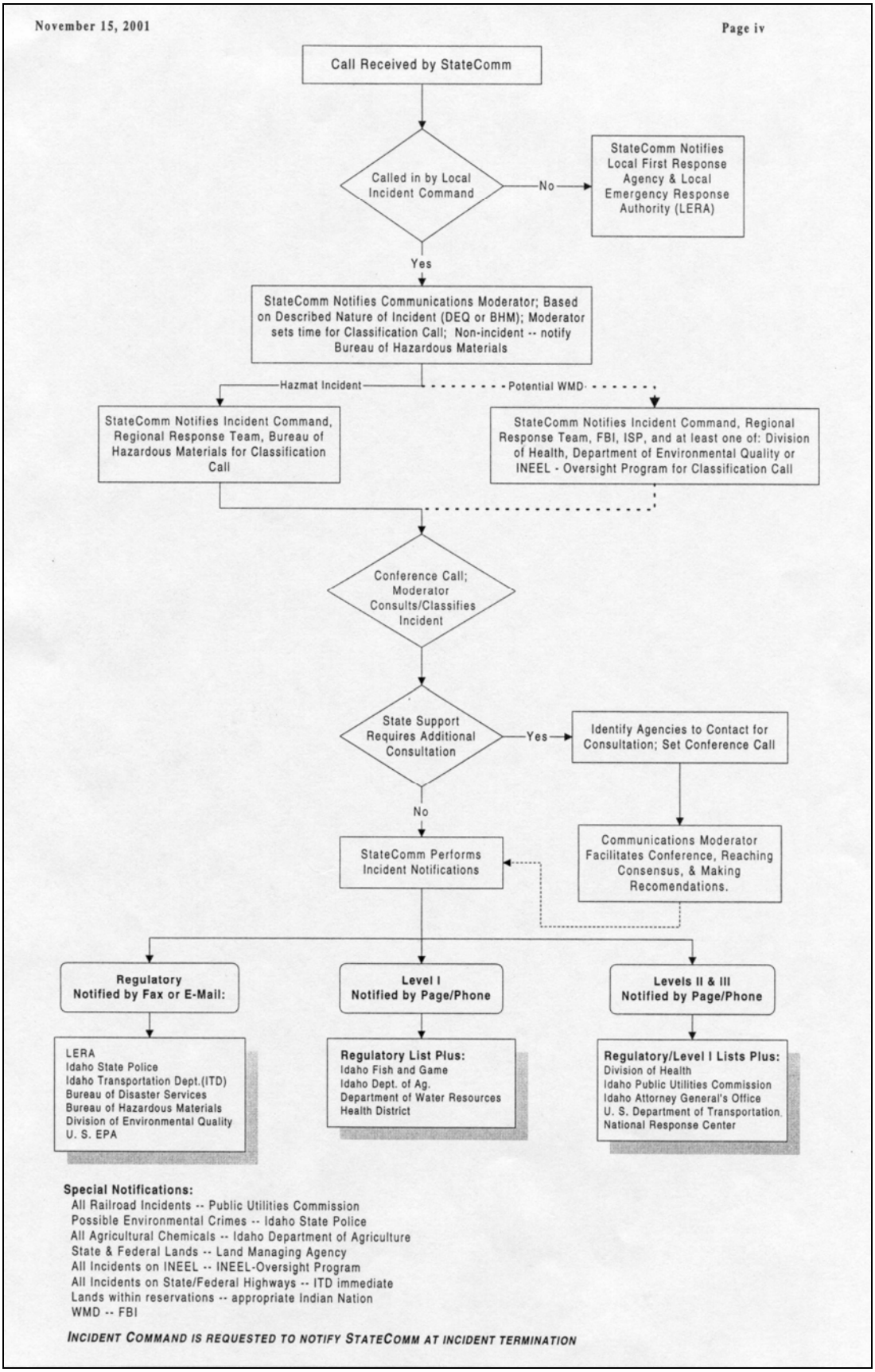


Figure F1. Idaho Emergency Response Flow Chart

APPENDIX G

Drinking Water Protection Plan
Certification Checklist

Drinking Water Protection Plan Certification Checklist

Public Water System Name: **City of Lava Hot Springs**

Local Contact: **J. Tony Hobson**

Date Returned to Water System: _____

Drinking Water Protection Plan **Approved _____ Disapproved _____**

Idaho Drinking Water Protection Plan guidance - *Protecting Drinking Water Sources in Idaho, August 2000* Pg. 28 of the document states "If a plan is found to satisfy all eight elements, then the community will be recognized by DEQ as having a "State Certified Plan". Additionally, supporting information describing each of the required elements is referenced as well."

Required Elements of Certified Source Water Protection Plan		**Element Addressed**	
Element 1	Description of Planning Team Participant Roles and Duties (Reference *Step 1:* Formation *of a Community Planning Team*)	**Yes**	**No**
Element 2	Delineation of the Drinking Water Protection Area (Reference *Step 2: Delineation of the Land Area to be Protected*)	**Yes**	**No**
Element 3	An Inventory of Potential Sources of Contamination (Reference *Step 3: Identification of Potential Contaminant Sources*)	**Yes**	**No**
Element 4	Management Tools and Protection Measures that will be Pursued to Manage Potential Sources of Contamination (Reference *Step 4: Development and Implementation of a Management Plan for Drinking Water Protection Area*)	**Yes**	**No**
Element 5	A Contingency Plan (Reference *Step 5a: Development of a Contingency Plan*)	**Yes**	**No**
Element 6	A Protection Strategy for New Wells or Intakes (Reference *5b: Planning for Future Drinking Water Sources*)	**Yes**	**No**
Element 7	A Public Participation and Education component	**Yes**	**No**
Element 8	An Implementation Strategy (what will be done, when it will be done, and by whom)	**Yes**	**No**

If a plan is found to satisfy all eight elements, then the community will be recognized by DEQ as having a "State Certified Plan". This certification will cover a three year period, after which recertification can be pursued by the community. Recertification will include an evaluation of the community's success in implementing drinking water protection as a measure of the community's strategy (Element 8).

Reviewers	**Agency/Affiliation**
_____	_____
_____	_____
_____	_____
_____	_____

APPENDIX H

Glossary

Glossary

Aquifer – A geologic formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Aquitard - A geologic unit of low-permeability that can store ground water and also transmit it slowly from one aquifer to another.

AST (Aboveground Storage Tank) – Sites with aboveground storage tanks.

Best Management Practices (BMPs) – Conservation practices or systems of practices and management measures that (1) reduce water quality degradation caused by nutrients, animal waste, toxics, and sediment, as well as control soil loss; and (2) minimize adverse impacts on surface water, groundwater flow, and circulation patterns and on the biological, chemical, and physical characteristics of wetlands.

Capacity – The flow rate that a pump is capable of producing; a water utility's ability to have resources available to meet the water service needs of its customers. In this context, capacity is the combination of plant- and service-related activities necessary to meet the quantity, quality, peak loads, and other service needs of the various customers or classes of customers served by the utility.

Community System – A public water system serving at least 15 service connections used by year-round residents or regularly serving at least 25 year-round residents.

Contaminant – Any physical, chemical, biological, or radiological substance or matter in water.

Contaminant Source Inventory – A record of the activities on a watershed or aquifer recharge area that have a potential to contaminate water.

Contingency Plan – A document that details the intended actions of a water utility under specified adverse conditions.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – A well discharging under pressure to a deep subsurface stratum. Such a well is often used to dispose of liquid waste streams to a suitable confined poor-water-quality aquifer that is generally considered unusable for other purposes; injection wells regulated under the Idaho Department of Water Resources generally for the disposal of storm water runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Group I Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

IDAPA – Idaho Administrative Procedures Act.

Inorganic Priority Area – Priority one areas where greater than 25 percent of the wells/springs show constituents higher than primary standards or other health standards.

Inorganic Contaminant (IOC) – An inorganic substance regulated by the US Environmental Protection Agency in terms of compliance monitoring for drinking water. Contained on the agency's list are contaminants as diverse as asbestos, nitrate (NO_3^-), cyanide, and nickel. This abbreviation came into common use in the US Environmental Protection Agency's Phase V drinking water regulations. An inorganic contaminant is sometimes called an inorganic chemical.

Leachate - The liquid that is derived from the leaching of buried refuse in septic systems, sanitary landfills and dumps by percolating water derived from rain or snowmelt. Leachate contains large numbers of inorganic contaminants, and the total dissolved solids can be very high.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Maximum Contaminant Level (MCL) – A value defined under the Safe Drinking Water Act Section 1401 (3) as the maximum permissible level (concentration) of a contaminant in water delivered to any user of a public water system. Maximum contaminant levels are the legally enforced standards in the United States.

Microbes – A microscopic organism, either plant or animal, invisible to the naked eye. Examples are algae, bacteria, fungi, protozoa, and viruses.

Nitrate Priority Area – Area where greater than 25 percent of wells/springs show nitrate values above 5mg/L.

Nonpoint Source – Waste material that enters a water body from overland flow rather than out of a pipe or channel; an unconfined discharge of waste.

Organic Priority Areas – These are any areas where greater than 25 percent of wells/springs show levels greater than 1 percent of the primary standard or other health standards.

P2 – An acronym for pollution prevention.

Perched Aquifer – A small lens of unconfined groundwater separated from an underlying main body of groundwater by an impermeable unsaturated zone.

Point Source – A discharge that comes out of the end of a pipe, as opposed to runoff or discharge from a field or similar source, which is called a nonpoint source.

Sanitary Survey – An on-site review of a water utility's water source, facilities, equipment, and operations and maintenance records for the purpose of evaluating the system's adequacy in producing and distributing safe drinking water.

Synthetic Organic Chemical (SOC) – An organic compound that is commercially made; some synthetic organic chemicals are contaminants in drinking water and are regulated by the EPA. The

regulated synthetic organic contaminants include volatile organic chemicals, pesticides, herbicides, polychlorinated biphenyls, selected treatment chemicals (e.g. acrylamide), and polynuclear aromatic hydrocarbons.

Time of Travel (TOT) – The determination, usually by modeling, of the time in years for ground water recharge to travel from a certain field point to the wellhead.

Vadose Zone – The unsaturated portion of the soil column between the land surface and the water table. A better term is *unsaturated zone*.

Volatile Organic Compound (VOC) – A class of organic compounds that includes gases and volatile liquids. Many volatile organic chemicals are used as solvents. A number of these compounds are regulated by the US Environmental Protection Agency.

Wastewater Land Application Site – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

Zone IA – Sanitary setback zone designed to prevent microbial contamination within a 100-foot radius of the wellhead. This setback zone is established in the Idaho Rules for Drinking Water Supplies (IDAPA 58.01.08.900.01) and requires that: sewer lines, livestock, canals, and streams be 50 feet from the source water/wellhead and that: home septic tanks, seepage pits, disposal fields, and privies are 100 feet away from the source water/wellhead.

Zone IB – Corresponds with the 3-year time of travel for ground water to reach the wellhead.

Zone II – Corresponds with the 6-year time of travel for ground water to reach the wellhead.

Zone III – Corresponds with the 10-year time of travel for ground water to reach the wellhead.