City of Cave Junction
Drinking Water Protection Plan

Compiled by Oregon Association of Water Utilities,
Source Water Specialist
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Revised
December 2005

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Section 1: Introduction

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect the welfare of the public by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and necessitates several actions to protect drinking water and its sources, rivers, lakes, reservoirs, springs, and ground water wells. This legislation empowers public water systems with the ability to ensure and improve their water quality. The Drinking Water Protection Plan (DWPP) utilizes several data sources to formulate a multi-faceted document. The DWPP is designed to be feasible and effective simultaneously so the community can implement the prescribed practices without a managerial or financial burden.

The purpose of this plan is to aid the Cave Junction Public Water System (PWS) # 4100971 in protecting its water source from potential contamination. This DWPP is a voluntary preventative measure that will help insure a safer drinking water supply for future generations being served by the system. The plan was drafted by a Source Water Specialist from Oregon Association of Water Utilities (OAWU). The foresight of the water system staff is evident in comprising this plan and has initiated a cost effective way to protect its water supply. This proactive approach compared to incurring the costs of reactive contamination treatment is intended to minimize strain on City resources. The major elements of the plan are as follows.

1.1: Abstract

The delineated drinking water protection area is primarily dominated by agriculture, and forestlands along with some frequented campgrounds and the Caves National Monument. The contained information was gathered for the City of Cave Junction to provide guidance to its consumers and the associated Responsible Management Authorities (RMA)s that reside within the Drinking Water Protection Area (DWPA). The City of Cave Junction has taken the initiative to incorporate the RMAs within the Drinking Water Protection Team (DWPT). This approach is a positive way to include stakeholders within the plan process.

The City of Cave Junction supplies water to approximately 629 connections with a future addition of 150 connections for the town of Kerby currently pending. The current population is approximately 1440 and growing. The source-water specialist reviewed the list of potential contaminant sources and performed a supplemental inventory. Information was gathered for City of Cave Junction to provide information to its consumers that reside within the drinking water protection area.

A total of 17 potential contaminant sources were identified in City of Cave Junction's drinking water protection area. The sheer size of the watershed dictated that management options in response to potential threats needed to be obtainable from the water system and respective stake-holder's perspective. The potential contaminant sources identified vary in scope based on the wide range of land use practices present.

A range of Best Management Practices (BMP)s were used to address the potential threats to Cave Junction's drinking water. An implementation schedule is also outlined to maintain the momentum of the plan and to establish a realistic timeline for the City to follow. A contingency plan that incorporates an Emergency Response Plan (ERP) was also developed in the event that the water supply becomes either contaminated or disrupted. The contingency plan addresses both short and long term replacement of water supplies to meet the minimum requirements of the system. The ERP outlines procedures and first responding contacts as well as procedural delegations and lines of succession based on the scope of the incident.

1.2: Background and Community Profile

The City of Cave Junction was incorporated in 1948, as the township was built around the logging industry. The City of Cave Junction is located 28 miles south of the city of Grants Pass, in Josephine County approximately 15 miles north of the Oregon/ California border in the scenic Illinois Valley. Josephine County has a population of approximately 75,000, with 1,363 people living within the city limits of Cave Junction. The area is predominantly white @ 92.3 percent, with the remaining ethnic percentages made up of Hispanic, American Indian and other races, respectively.

1.3: Natural Environment

The monthly mean precipitation for the Cave Junction area is of 62.65 inches with the monthly mean low and high temperatures being 39.6^0 F and 68.2 F respectively. In Oregon there is a gradual transition from the mild, wet coastal sites to the drier, milder inland valleys. As air crosses the coast range and drops into the Valley, it warms slightly and gets a bit drier, and annual precipitation is reduced to about 30-60 inches per year with a 140 day growing season. The bulk of the precipitation begins usually in November and tapers off in May *(Hatton, Taylor 2003)*.

The Geography is defined by the Illinois River Valley and its tributaries surrounded by mountains. The elevation ranges from 1236' just north of Cave Junction to 3600' in the west at the top of Woodcock Mountain increasing to 7055' on Grayback Peak to the east. The soils range widely from sandy loam alluvial deposits to peridotite composites with magnesium, iron, alumina, sodium, calcium, potassium and silica forming the soil base that supports the unique plant species of the area.

Table 1.3A: Mean Monthly Temperature and Precipitation 1971-2000

Climate data from the period of 1971-2000 was used to show the trend over the past several decades in terms of mean temperature and rainfall *(Oregon Climate Service)*.

Monthly Mean Temperature												
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
39.3	43.0	46.4	50.9	57.7	64.8	71.3	70.5	64.7	55.1	44.8	39.0	54.0
Monthly Mean Precipitation												
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
10.81	9.75	4.10	2.27	.74	.28	.55	8.15	1.32	3.66	10.04	10.98	62.65

Section 2: Drinking Water Team/ RMA Attendees

Table 2A: Drinking Water Team Contact List

Title	*Member Name*	*Contact Information*
CJ-Water System Operator	Paul Anderson	541-592-3254
CJ-Water System Staff	Steve Bethke	541-592-3254
City of Cave Junction	~~Tammy Maher~~	541-592-4590
Josephine Soil Conservation District	Mike Bollweg	541-592-4590
IVFD	Kris Sherman	541-592-2225
USDA FSA Jackson/Josephine Co.	Donna Finch	(541)776-4270 Ext.2
USFS	Pam Bodie	541-592-4001

2.1: Drinking Water Protection Team Strategy

The City of Cave Junction's assembly team for the drinking water protection plan will consist of Responsible Management Authority (RMA)s and community members. Meetings will be facilitated by the Source-water Specialist from Oregon Association of Water Utilities. Information regarding the DWPT and regular meetings will be distributed to the property owners who reside within the drinking water protection area. These steps are taken to ensure the success of the plan through community involvement and consensus in regards to management approaches within the community.

The City of Cave Junction feels that it is essential for as many people as possible to participate in order for this program to prevail and be deemed a victory. Information, such as posters, may be placed at locations such as post offices, markets and areas where people congregate. As the drinking water protection program develops, continued information will be delved out to the consumers through fliers, articles in the local newspapers and meetings of general information conducted by the assembly team.

2.2: Responsible Management Authorities (RMA)

A Responsible Management Authority (RMA) refers to any entity with rule and ordinance-making authority or the ability to manage activities within a Drinking Water Protection Area (DWPA). RMAs can be public or private entities, including a Public Water System. RMAs are an essential part of the planning process, since some of the land they operate on is within the DWPA. A partnership with these entities in protecting an irreplaceable natural resource is the goal of this document. With only the recognition of the DWPA and improved communication between these entities and the water system, the plan can be deemed a success in the context of these established or improved relationships.

2.2A: RMA Roles and Participation

Each of the listed Agencies are identified as an RMA according to impacts or decisions regarding the DWPA delineated by the DEQ. All of the RMAs were contacted and informed of the plan process and their input was requested through involvement in the DWPT. Although the ideal situation is to have all of the applicable RMAs present at the DWPT meeting, a simple review of the plan and individual meeting with the Source Water Specialist would suffice in regards to understanding the plan purpose and increasing communication with the water system.

2.2B: Signatory Status/Description of Notification

The associated RMAs will be notified via a letter describing the process of the plan and DWPT meetings. Enclosed within the letter is an invitation to attend a DWPT meeting and the applicable information discussing the water system's plans to obtain approval of the organization by signature in reference to reviewing and abiding by practices laid out in the plan. RMA input will then be considered by the water system and alterations can be made if the City of Cave Junction deems them necessary for plan success.

2.2C: Identified Responsible Management Authorities

- **BLM**
- **City of Cave Junction**
- **Illinois Valley Soil Conservation District**
- **Josephine County**
- **ODOT**
- **Oregon State Parks**
- **USDA-FSA**
- **USFS**
- **Waldo Mining Association**

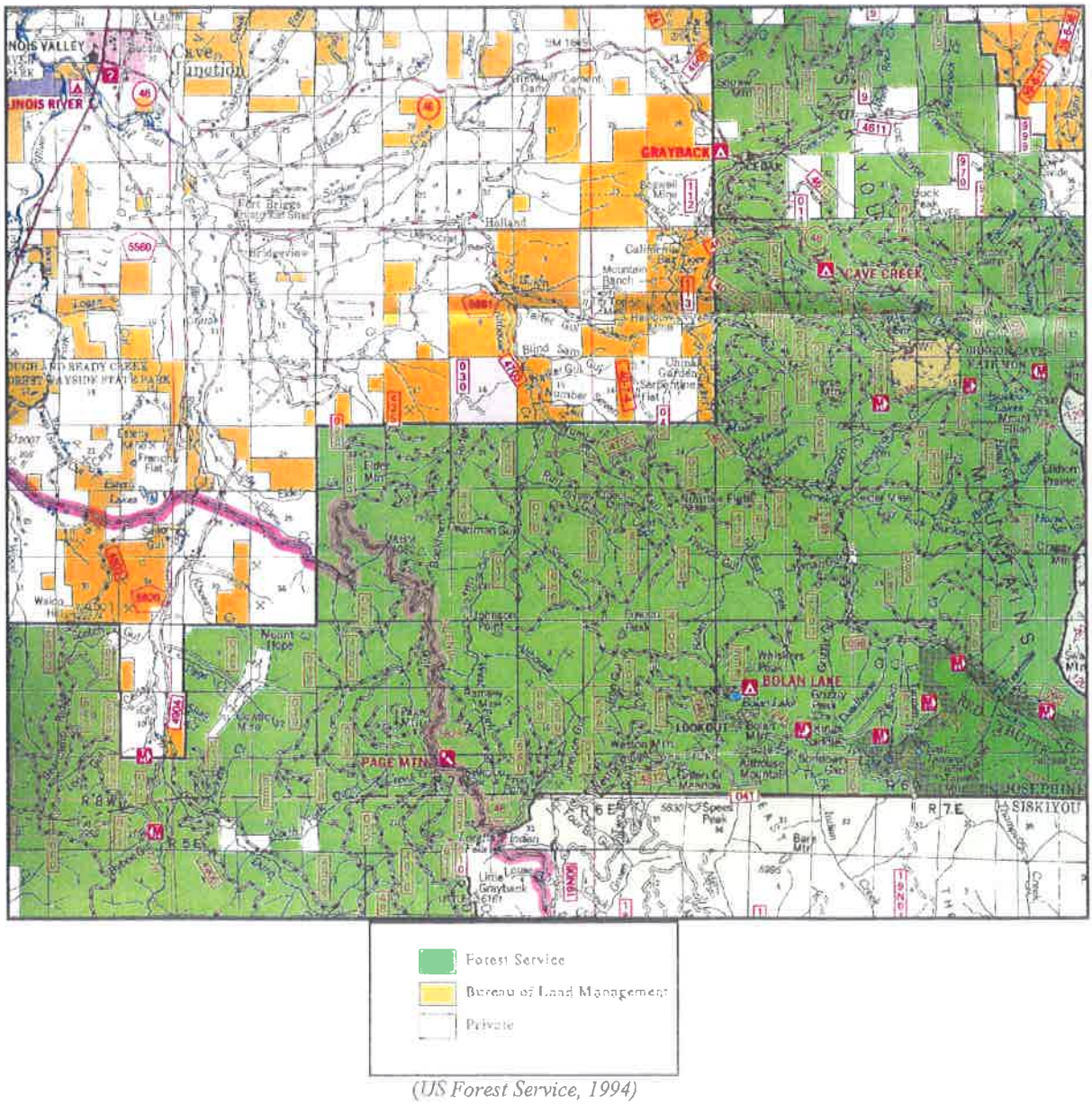
2.3: RMA Identified Boundaries

The included map shows the relevant federal agencies jurisdiction within the watershed. Yellow plots dictate the Bureau of Land Management (BLM) managed land, green plots are managed by the U.S. Forest Service (USFS), and white plots are privately owned lands. All of the areas corresponding owners and management agencies are considered RMAs in the DWPA. The white privately owned plots would be subject to Josephine County jurisdiction as well as the USDA-FSA for farming plots and potential new program implementation, such as the Conservation Reserve Program (CRP). The majority of private land owners are a viable resource to the success of the plan and include wineries, mining operations, farmers and ranchers. The Illinois Valley Soil Conservation District has also been included based on current dealings with local area residents and farmers.

Figure 2.3A: Jurisdictional Boundaries Identification Map

A portion of the 1994 USFS map was used for distinction purposes between BLM, private, and USFS managed land. It also includes multiple campgrounds that are present in the East/Southeastern portion of the watershed. Campgrounds are managed by the Oregon State Parks and other respective federal agencies.

Individually each of the aforementioned stakeholders could have a potential impact on the water quality. Collectively they have the ability to protect the source or unknowingly be a detriment. This indicates the need for education for private landowners and the associated agencies. Through the distribution of Source Water Protection information stakeholders and visitors alike will have the opportunity to take an ownership role in protection of the area and the water source.



(US Forest Service, 1994)

Section 3: Drinking Water Protection Area (DWPA)

Comprised partially of the Klamath Mountains the DWPA is densely forested, the topography is rugged and steep towards the southeast boundary of the DWPA. The range has been cut by several rivers to form distinct mountain ranges. The primary supply stems from all of the associated tributaries and mainly the East Fork portion of the Illinois River. The DWPA extends over 232 square miles and elevations range from approximately 6600' to 1290' at the intake. The principal ranges are the Siskiyou Mountains extending from Northern California into Oregon and the Trinity Mountains to the south in California *(ORCRS, 2004)*.

The Source Water Assessment (SWA) constitutes the determination of the DWPA, the following three components are included in the state mandated SWA; Delineation, Sensitivity/Susceptibility Analysis, and an Inventory of potential contaminant sources.

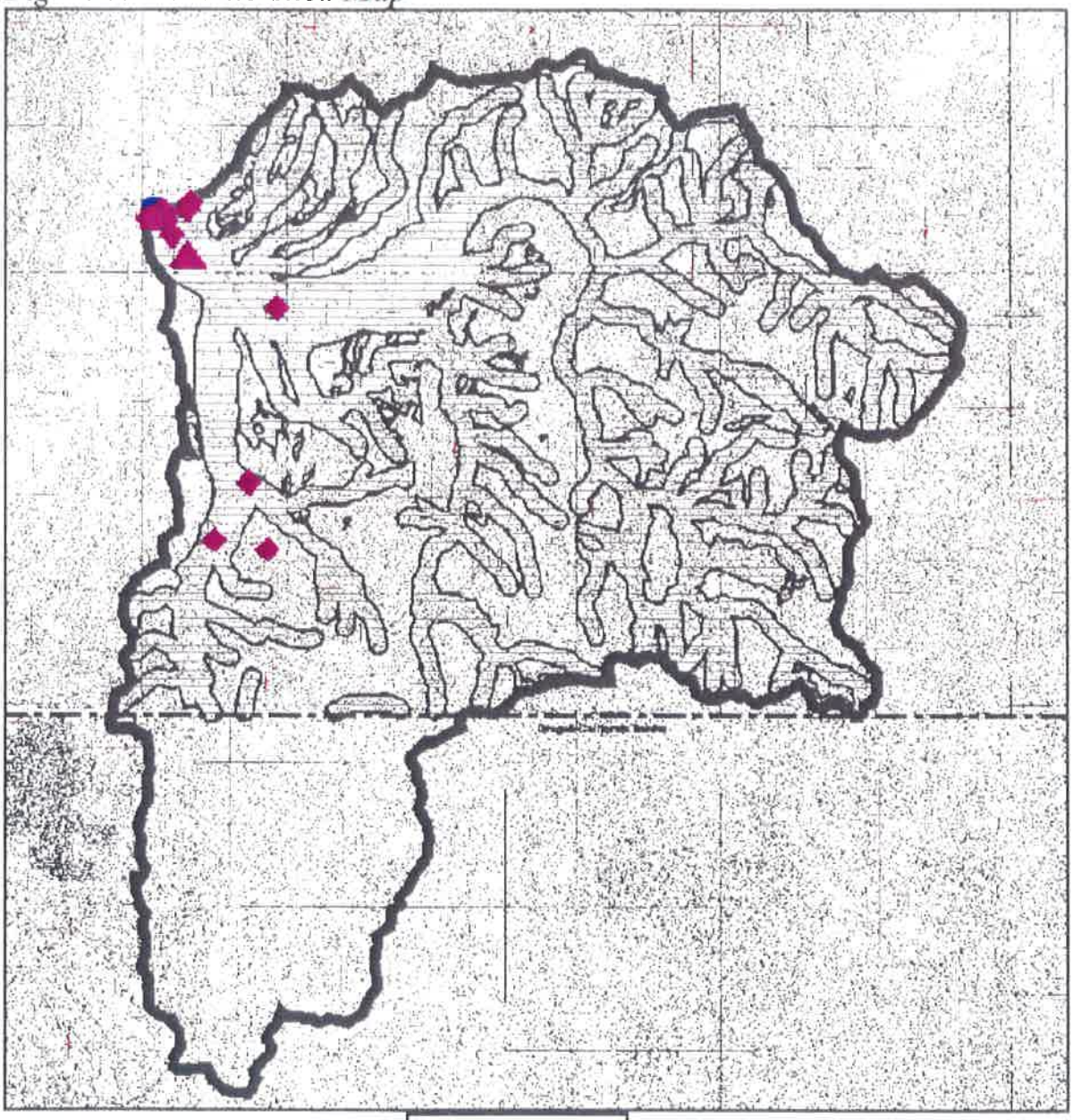
The referenced Source Water Assessment addresses only the surface water component of Cave Junction's drinking water supply up to the state border. The protection area within an 8-hour travel time from the intake extends approximately 16 miles upstream of the Cave Junction Intake. The protection area includes the East Fork Illinois River/Althouse Creek/Sucker Creek Watersheds in the Illinois Subbasin of the Southern Oregon Coastal Basin *(DEQ, 2003)*.

Section 3.1: Watershed Characteristics

The geographic area providing water to Cave Junction's intake in the Drinking Water Protection Area (DWPA) within Oregon extends upstream approximately 233 miles in a southerly direction. The **Watershed's** (*An area that, because of topographic slope, contributes water to a specified surface water Drainage system, such as a stream or river. An area confined by topographic divides that drains a given stream or river*) upper boundary near the Caves National Monument, comprises the upper portion of the Cave Creek watershed which drains into the Illinois River and then into the Rogue River. The elevation at the Cave Visitor Center is about 4,000 feet with surrounding peaks reaching as high 6600 feet. The outer boundary of this watershed is the Cave Junction divide formed by the surrounding ridges and hills.

The Illinois Subbasin HUC # 17100311 is a southern section of the Southern Oregon Coastal Basin. It is a catchment basin for approximately 981 square miles (USGS) of primarily Josephine County with a small portion of the Subbasin located in Curry County. The Subbasin includes the Illinois River and its tributaries from the headwaters in the Klamath Mountains to its confluence with the Rogue River at Agness *(DEQ, 2003)*.

Figure 3.1A: Watershed Map



(DEQ, 2003)

3.1B: Streams/ Creeks

Major tributaries to the Illinois River within the subbasin are Lawson, Indigo, Silver, Collier, Deer, Josephine, West Fork, and East Fork. Included in this area are a number of tributaries to the main stem, including Chapman, Tycer, Kelly, Althouse, Elder, and Sucker Creeks and their tributaries. Based on the EPA Reach File data, the mean velocity for the segment of the East Fork Illinois River where Cave Junction's intake is located is less than 3 feet/second, which is used to estimate 16 miles traveled in an 8-hourperiod *(DEQ, 2003)*.

Figure 3.1C is included for several purposes including but not limited to determining focus areas within each relevant section and a Best Management Practice (BMP) Needs Assessment through an in depth analysis which can be performed at a later date. Some of the proposed practices constitute a range of activities spanning from responsible land uses in close proximity to streams, as well as a lack of activity based upon following the 1000' setback buffer refer to section 4.

Figure 3.1C: Aerial Photo of Tributaries and East Fork Illinois River

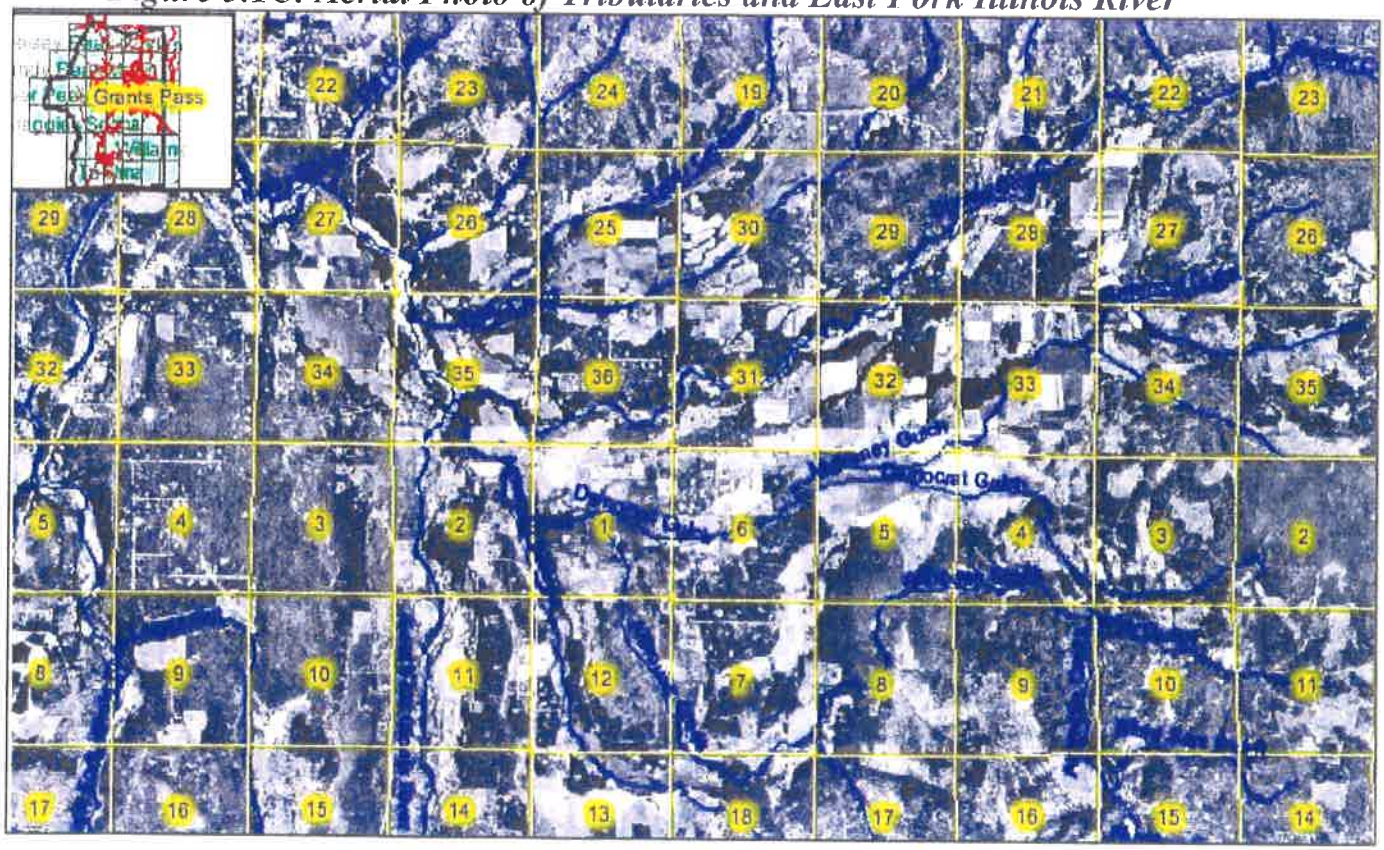


Table 3.1D: Annual Stream-flow Statistics Illinois River

Historical flow data is included to show the pronounced annual quantity variances and stress water quality needs. However, this data is taken after the confluence of the East and West Fork Illinois Rivers and therefore variances exist compared to what the City of Cave Junction receives at its intake which located solely on the East Fork Illinois River.

Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s
1962	1,135	1973	1,542	1984	1,463	1994	616
1963	1,381	1974	1,497	1985	651	1995	1,762
1964	1,637	1975	1,510	1986	1,331	1996	2,241
1965	1,010	1976	637	1987	990	1997	1,184
1966	1,548	1977	881	1988	795	1998	1,935
1967	1,062	1978	1,091	1989	970	1999	1,562
1968	1,170	1979	1,152	1990	684	2000	1,040
1969	1,318	1980	1,251	1991	630	2001	571
1970	1,580	1981	1,455	1992	646	2002	1,104
1971	1,596	1982	1,867	1993	1,375	2003	1,214
1972	1,404	1983	2,300				

(Hydrologic Unit Code 17100311, Latitude 42°13'55", Longitude 123°39'45" NAD27
Drainage area 380.00 square miles, Gage datum 1,198.80 feet above sea level NGVD29, USGS, 2005)

For Current stream-data use the link below
http://waterdata.usgs.gov/nwis/uv/?site_no=14377100&agency_cd=USGS

Extremes for Period of Record: Maximum discharge, 92,200 ft^3/s Dec. 22, 1964, gage height, 45.28 ft, from flood-mark, site and datum then in use, from rating curve extended above 30,000 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 12 ft^3/s Aug. 24, 1992.

3.1E: Floodplain/Flood Data

The 100-year flood event is a flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood.

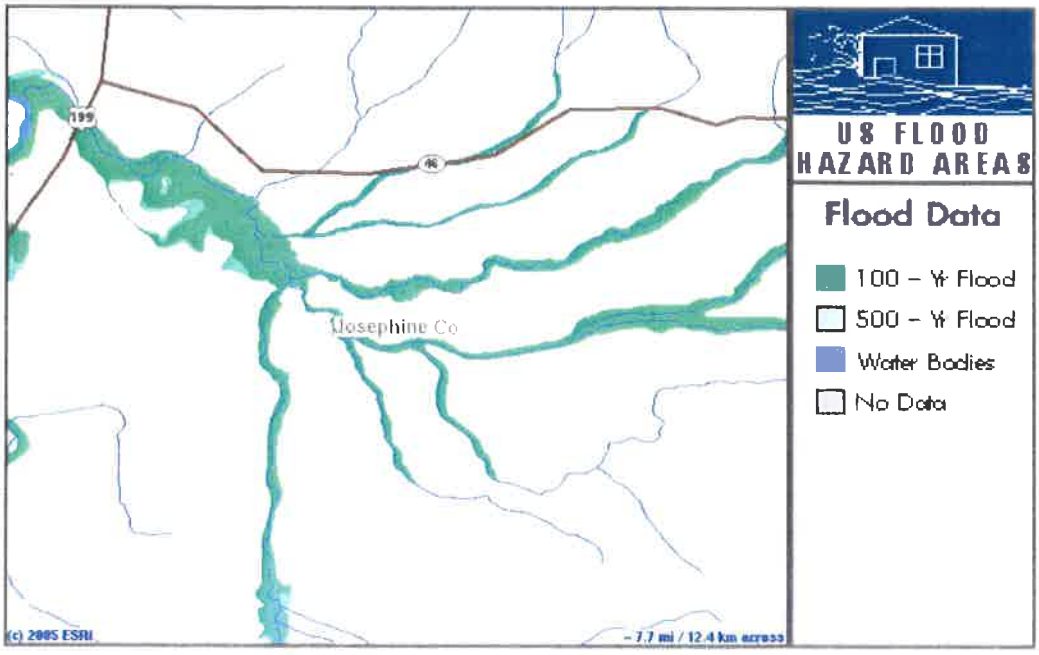
Riverine flooding is the overbank flooding of rivers and streams. The natural process of riverine flooding adds sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Flash flooding is caused by extremely intense rainfall over a short period of time, commonly within a single drainage. Flash floods usually occur in the summer during the thunderstorm season. The two key contributors to flash flooding are rainfall intensity and duration. Topography, soil conditions and ground cover also impact flooding. Flash floods, because of their intensity, often pick up large loads of sediment and other solid materials. In these situations, a flash flood may arrive as a fast moving wall of debris, mud and water.

Occasionally, floating debris or ice can accumulate at a natural or man-made obstruction and restrict the flow of water. Water held back by the ice jam or debris dam can cause flooding upstream. Subsequent flash flooding can occur downstream if the obstruction suddenly releases. Areas subject to flash floods are not as obvious as a typical riverine floodplain. However, flash floods may be associated with recognizable locations such as canyons or arroyos. The most notorious flash flood in Oregon is the June 1903 event in Heppner *(State of Oregon Natural Hazards Mitigation Plan, June 2000).*

Figure 3.1F: Flood Hazard Map

A flood map of the Illinois River and relevant tributaries was included to elaborate on the propensity of flood for supplying tributaries to the Cave Junction Public Water System.



3.2: Geology of the DWPA

Most of the rock formations in Josephine County are interpreted to be part of an ophiolite suite (ancient sea floor rocks) or island arc volcanic deposits *(Hull, 1979)*. Geologic parent rocks range in age from 200 million years old to the recent ice-age alluviums that are about 50,000 years old. The rocks vary in composition from granitics to the metamorphosed peridotites (serpentine) that support the habitat for many of the sensitive species of plants.

In Oregon only the western Paleozoic and Triassic belt and the western Jurassic belt are present. The western Paleozoic and Triassic belt includes the Applegate Group which contains the marble from which the caves at Oregon Caves National Monument were formed. The western Jurassic belt includes the Rogue and Galice Formations (Baldwin, 1976). Hotz in 1971 described the schists beneath thrusts ("Schists of Condrey Mountain") as two main types: a graphitic quartz-muscovite schist and an actinolite-chlorite schist *(ORCRS, 2004)*.

The area that is drained by the Illinois River and its tributaries contains the broad valley in which Cave Junction is located. Extending from the California border to the town of Kerby which Cave Junction PWS supplies indicates a complex process of tectonism, erosion, and alluviation *(Hull, 1979)*. The geology of the watershed is therefore complex and varied from the upper boundaries to the valley floor. Refer Appendix D for relevant Maps.

Geologic Units:

- ***QS-Quaternary sediment***: Stream deposited sand, silt and gravel; bench gravel deposits; glacial moraine; outwash and fan deposits

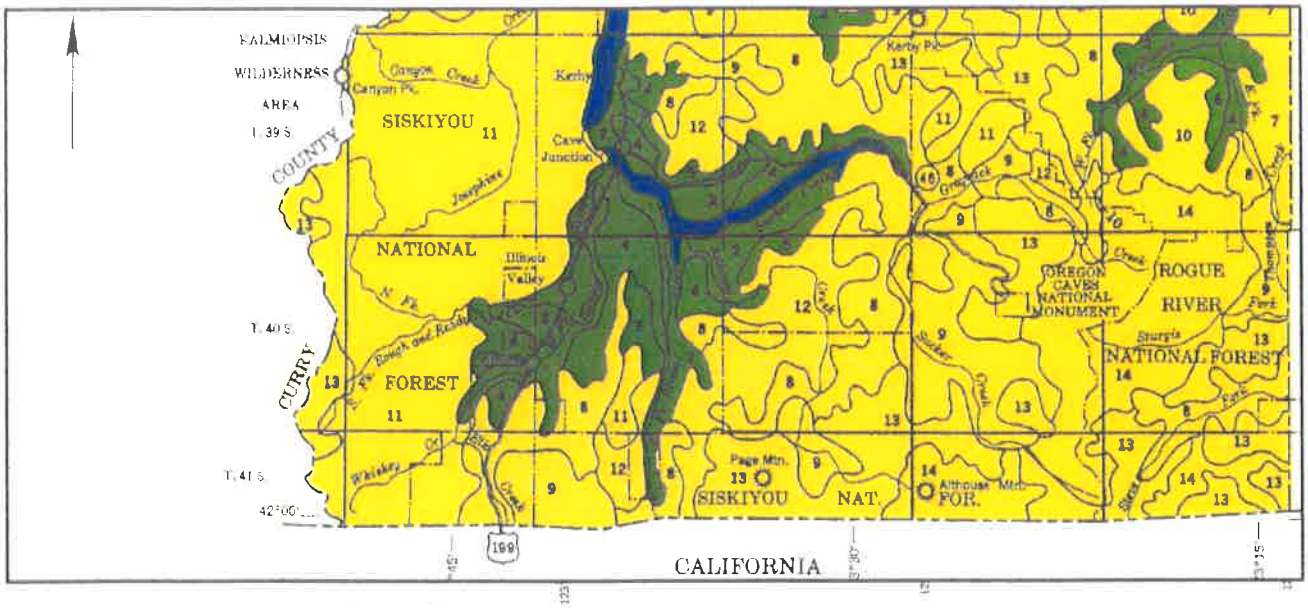
- ***Tras/Trav-Applegate Group:*** Metasedimentary rocks that include slaty siltstone, argillite, quartzite, phyllite, schist, chert, conglomerate, and lenses of limestone (largely marble)

- ***di -Quartz diorite and related rock:*** includes horneblende diorite, granodiorite and a few dacite and diabase dikes.

- ***um –Ultramafic rock:*** Largely serpentenite with some residual periodotite including harzburgite, dunite and pyroxenite.

3.2A: General Soil Map/Soils

Due to the extremely large size of the watershed a general overview of soil contents present in close proximity to Althouse Creek, Sucker Creek, and the East Fork Illinois River were included to establish a link to the varied geology and morphology that has taken place. A correlation to suspended solids and soil types is a genuine concern for a surface water source and the relevant information was taken from the General Soil Map for Josephine County and zoomed in to accentuate the Cave Junction area. The areas of focus contain soils: 1, 2, 4, and 5, with 8, 9, 11, 12, and 13 in the eastern region with areas of substantial relief. Refer to the Soil map legend below for descriptions. Refer Appendix D for relevant Maps.



MAP UNITS*

AREAS DOMINATED BY DEEP, WELL DRAINED TO EXCESSIVELY DRAINED SOILS ON FLOOD PLAINS

Newberg-Camas-Evans: Deep, well drained to excessively drained fine sandy loam, gravelly sandy loam, and loam

AREAS DOMINATED BY DEEP, WELL DRAINED TO SOMEWHAT POORLY DRAINED SOILS ON LOW STREAM TERRACES, ALLUVIAL FANS, AND HILLSIDES AND IN DRAINAGEWAYS

1 Takilma-Hoehlin-Kelby: Deep, well drained cobbly loam, gravelly loam, and loam

2 Clawson-Jerome: Deep, somewhat poorly drained sandy loam

4 Pollard-Abegg: Deep, well drained loam and gravelly loam

5 Brockman: Deep, moderately well drained cobbly clay loam and clay loam

AREAS DOMINATED BY MODERATELY DEEP AND DEEP, WELL DRAINED AND SOMEWHAT EXCESSIVELY DRAINED SOILS ON HILLSIDES, TOE SLOPES, AND ALLUVIAL FANS

Holland-Barron-Siskiyou: Deep and moderately deep, well drained and somewhat excessively drained sandy loam, coarse sandy loam, and gravelly sandy loam

AREAS DOMINATED BY SHALLOW TO DEEP, MODERATELY WELL DRAINED TO SOMEWHAT EXCESSIVELY DRAINED SOILS ON MOUNTAINSIDES, HILLSIDES, RIDGES, ALLUVIAL FANS, AND STREAM TERRACES

7 Vannoy-Manita-Voorhies: Deep and moderately deep, well drained silt loam, loam, and very gravelly loam

8 Josephine-Speaker-Pollard: Deep and moderately deep, well drained gravelly loam and loam

9 Beekman-Vermisa-Colestine: Moderately deep and shallow, well drained and somewhat excessively drained, extremely gravelly loam and gravelly loam

10 Siskiyou-Tetrick: Deep and moderately deep, somewhat excessively drained and well drained gravelly sandy loam and gravelly fine sandy loam

11 Pearsoll-Dubakella-Eightlar: Shallow to deep, well drained and moderately well drained extremely stony clay loam, very cobbly clay loam, and extremely stony clay

12 Gemutt-Dubakella: Deep and moderately deep, well drained cobbly clay loam and very cobbly clay loam

13 Jayar-Althouse: Moderately deep and deep, well drained very gravelly loam and very gravelly silt loam

14 Crannler-Goldwin-Rogue: Moderately deep and deep, somewhat excessively drained and well drained very stony sandy loam and stony coarse sandy loam

*Terms for texture refer to the dominant texture of the surface layer of the major soils.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OREGON AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

JOSEPHINE COUNTY, OREGON

Scale 1:316,800
1 0 1 2 3 4 5 Miles

Compiled 1981

3.2B: Flora and Fauna

There are 28 different coniferous species, 20 of which are used commercially. Table TC-1 (BLM, 2000) was included to show the distribution of timber and varying species within the watershed on private and federal lands. Refer to Appendix D for relevant maps.

Table T-C-1: Plant Series in the East Fork Illinois Watershed			
WITHIN NATIONAL FOREST BOUNDARY			
Plant Series	Acres	% of Ownership	% of Watershed
Tanoak or Douglas-fir [1]	15,558	42	27
White Fir	14,539	40	25
Douglas-fir	3,487	10	6
Tanoak	1,784	5	3
Port-Orford-cedar	911	2	<2
Jeffrey pine	405	1	<1
BLM LANDS			
Douglas-fir	3,049	63	6
Jeffrey pine	1,336	24	2
Ponderosa pine	95	2	<1
Tanoak	442	9	<1
White oak	5	<1	<1
Riparian hardwood	19	<1	<1
Non-vegetated	97	2	<1
NON-FEDERAL OWNERSHIP			
Douglas-fir	3,607	23	6
Jeffrey pine	1,375	9	2
Tanoak	1,700	11	3
White oak	87	<1	<1
Non-vegetated	628	4	1
Non-forest Includes rural development and Cave Junction	8,431	53	15

Plant Species:

Two examples of plant species include Lomatium cookii, and Limnanthes floccose ssp. grandiflora. Each of the plants are found in the French Flat/Illinois Valley sites grow in seasonally wet soils.

Lomatium cookii a perennial forb in the carrot family (Apiaceae), Lomatium cookii grows 1.5 to 5 decimeters (dm) (6 to 20 inches (in)) tall, from a slender, twisted taproot. Leaves are smooth, finely dissected, and strictly basal (growing directly above the taproot on the ground, not along the stems). One to four groups of clustered, pale yellow flowers produce boat-shaped fruits 8 to 13 millimeters (mm).

Limnanthes floccosa ssp. grandiflora is a delicate annual in the meadowfoam, or false mermaid, family (Limnanthaceae), Limnanthes floccosa ssp. grandiflora grows 5 to 15 centimeters (cm) (2 to 6 in) tall, with 5-cm (2-in) leaves divided into five to nine segments. The stems and leaves are sparsely covered with short, fuzzy hairs. The flowers, and especially the sepals, are densely covered with woolly hairs. Each of the five yellowish to white petals has two rows of hairs near their base.

Lomatium cookii also occurs in Rough and Ready Creek Forest Wayside State Park, southwestern Josephine County; both east and west of Cave Junction, Oregon; east and southeast of Woodcock Mountain near Woodcock Creek; and a few scattered sites are northeast of Kerby, Oregon, near Reeves Creeks. These sites are collectively referred to as the French Flat/Illinois Valley sites *(EPA, 2002)*.

The occurrence of these plants within vernal pools and within close proximity to the subsequent tributaries can be an indication of riparian health and potentially aid in determining a disturbance of the 1000' buffer for each tributary within the DWPA. A direct link of native species versus invasive plantings for livestock can also be used as an indicator of potential contamination and degradation.

3.3: Sensitive Areas

The sensitive areas are those where potential contamination sources (PCS) or land use activities that have a greater potential to impact the water supply. The sensitive areas within the watershed include both setbacks (land adjacent to streams) and other natural factors that increase the risk of contamination of the surface water, including soil erodibility, permeability and runoff potential.

The first sensitive area is a setback using a consistent 1000' (about 300 meters) from the water body. The 1000' sensitive area setbacks are intended to identify those areas where there are higher risks of contamination by spills or other releases, simply due to their proximity to the water body. The sensitive area setbacks are identified as a minimum of 1000' from centerline of the intake stream and all perennial tributaries within the delineated drinking water watershed. The distance of 1000' was based on EPA national guidance for the distance to conduct the potential contamination source inventories adjacent to streams *(DEQ 2003)*.

Figure 3.3A: Constructed Intake Sensitivity

Cave Junction's intake is located at an approximate elevation of 1,280 feet as East Fork Illinois River flows into the valley floor from the foothills. The upper edge of the watershed is located at an elevation of approximately 7,055 feet at Grayback Mountain; therefore, the elevation change from the upper edge of the watershed to the intake is approximately 5,800 feet. The outlined red areas that are cross hatched constitute sensitive areas and the corresponding setbacks near the intake which is indicated by the blue sphere.

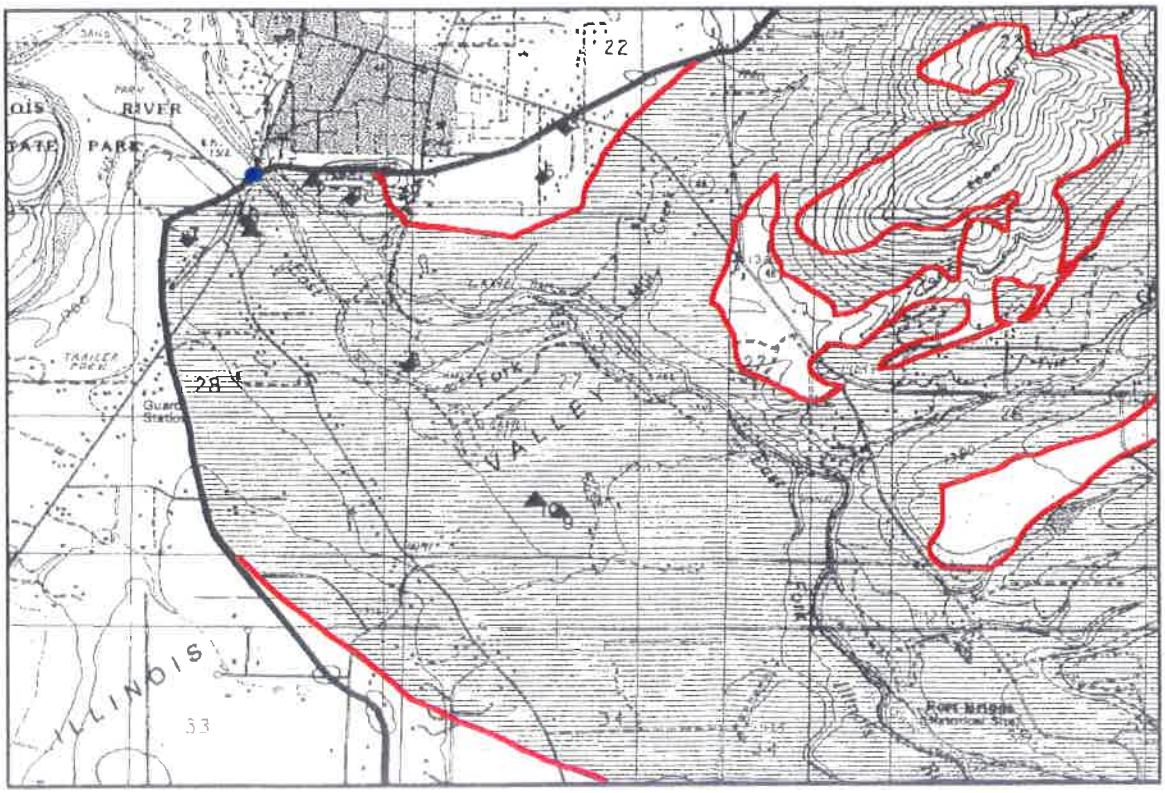


Table 3.4: Surface-Water Rights

Source	Permit #	Certificate #	Priority Date	Cubic FT. Per Second	Gallons per minute
East Fork Illinois River	18785 36172	55491	*June 16, 1949 March 8, 1971 (affixed 1-22-1987) (affixed 4-24-1997)	1.0 2.0	448.9 897.7

** indicates earliest obtained water right information date via document*

3.5 Raw Water Quality Analysis:

Data was acquired via DHS website and concentrations are only listed if present. Tests range in dates from Archived dates from March 2002 to May 2004.

Table 3.5A: Latest Chemical Results

Date	Chemical	Source ID	Results	MCL	UOM
05/18/2004	TOTAL HALOACETIC ACIDS (HAA5)	DIST-A	0.0161		
05/18/2004	TOTAL HALOACETIC ACIDS (HAA5)	DIST-A	0.0208		
05/18/2004	TOTAL TRIHALOMETHANES (TTHM)	DIST-A	0.0124		
05/18/2004	TOTAL TRIHALOMETHANES (TTHM)	DIST-A	0.0145		
06/11/2003	ARSENIC	EP-B	0.0011	0.0500	MG/L
06/11/2003	BARIUM	EP-A	0.0097	2.0000	MG/L
06/11/2003	BARIUM	EP-B	0.0160	2.0000	MG/L
06/11/2003	CHROMIUM	EP-B	0.0040	0.1000	MG/L
06/11/2003	NICKEL	EP-A	0.0026	0.1000	MG/L
06/11/2003	NITRATE (AS N)	EP-B	0.7000	10.0000	MG/L
06/11/2003	NITRATE+NITRITE (AS N)	EP-B	0.7000	10.0000	MG/L
06/11/2003	SODIUM	EP-A	10.0000		MG/L
06/11/2003	SODIUM	EP-B	6.0000		MG/L
03/19/2002	NITRATE (AS N)	EP-B	1.0400	10.0000	MG/L

Table 3.6: Current and Alternate Water Sources

Cave Junction's main water source is the East Fork Illinois River; the intake is located in the southwest part of town in close proximity to the junction of Highway 199 and Highway 46. The secondary and back-up source is the Daisy Hill Well. Water source totals are approximate and range from 145,762,000 total gallons for July 2003-June 2004 (in gallons per month). According to the last sanitary survey the yield from the surface source was 1500gpm and 230gpm from the groundwater source. During high turbidity events associated with winter storms, the intake is closed and the groundwater source becomes primary.

ID	Facility Name	Activity Status	Availability	Source Type
EP-A	EP FOR ILLINOIS RIVER (EAST FORK)	A		SW
SRC-AA	ILLINOIS RIVER (EAST FORK)	A	permanent	SW
EP-B	EP FOR DAISY HILL WELL	A		GW
SRC-BA	DAISY HILL WELL	A	permanent	GW

Table 3.7: Treatment Processes

The City of Cave Junction has a drinking water treatment plant in current operation and all of the processes and objectives are contained in the table below. The surface water source is treated through a conventional direct filtration treatment source. All records with regards to state requirements are up to date and compliance issues have been met. The water plant is designed to produce 720,000gpd within an eight hour period day. Peak plant productions have been as high as 657,541gpd.

State ID	Facility Name	Treatment Process	Treatment Objective
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	FLOCCULATION	PARTICULATE REMOVAL
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	COAGULATION	PARTICULATE REMOVAL
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	SEDIMENTATION	PARTICULATE REMOVAL
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	RAPID MIX	PARTICULATE REMOVAL
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	FILTRATION, RAPID SAND	PARTICULATE REMOVAL
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	HYPOCHLORINATION, POST	DISINFECTION
WTP-A	TP FOR ILLINOIS RIVER (EAST FORK)	PH/ALKA ADJ-SODA ASH	CORROSION CONTROL
WTP-B	TP FOR DAISY HILL WELL	HYPOCHLORINATION, POST	DISINFECTION

Table 3.9B: Risk Prioritization PCS Summary

The PCS are listed according to potential risk based on location relative to the sensitive areas. All of the listed PCS are only considered potential sources and contamination is not necessarily likely to occur if contaminants are managed properly.

A total of 17 potential contaminant sources were identified in City of Cave Junction's drinking water protection area. Of these, 13 are located in the sensitive areas and 12 are high- to moderate-risk sources within "sensitive areas". The sensitive areas within the City of Cave Junction drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply *(DEQ, 2003)*.

Quantity Present	Type of PCS	Risk Ranking	Proximity to sensitive areas
several	Managed forestland/Clear-cuts	higher	within
2	Highway, Transportation Corridor	higher	within
several	Grazing Animals	higher	within
several	Mining/Gravel Pits	higher	within
several	Housing Development	higher	within
several	Crops-Irrigated/AG Land	higher	within
1	Junkyard/Salvage	higher	within
1	Nursery/Fertilizer Storage	higher	within
several	Logging Roads	moderate	outside
several	Rural Septic Systems High Density	moderate	within
1	Chemical/Oil Storage Facility	moderate	outside
several	Above Ground Storage Tanks ASTs	moderate	within
several	Abandoned Wells	moderate	within
1	Automotive Repair	moderate	within
several	Rural Septic Systems low density	lower	
several	Crops non-irrigated	lower	
several	Campgrounds	lower	

Section 4: Best Management Practices-BMPs

BMPs are used to determine methods that are the most productive and applicable for the community in question with the potential contaminants sources present. BMPs are listed in accordance with, **regulatory** land use practices, such as (zoning, health and developmental ordinances), and **non-regulatory**-structural (devices/storage and containment), Usage of equipment, maintenance of (equipment and vehicles) location and measures involved, storage of chemical supplies, fertilizers, and pesticides.

This section of the Drinking Water Protection Plan determines the best management practices associated with those potential contaminant sources according to local land use practices. Section 4 is based on each PCS and its associated risk ranking along with the location relative to the DWPA sensitive areas. The Potential Contaminant Sources' are listed with viable BMPs. Lower risk PCS are mentioned however, the primary focus of this plan and implementation of BMPs directed at High and Moderate potential risks.

4.1: Best Management Practice Perspective

Every practice can be expanded upon to establish improvement to the area of concern and the natural resources involved. An increased effort through implementing and expanding upon these practices will ensure that this plan will remain a living document that serves future generations. Many aspects addressed in this plan are tied directly to the availability of a clean drinking water source; some of these include property values, urban growth and sustainability. Participation of all of the stakeholders (*RMAs*) involved will help promote drinking water protection. In most cases the suggestions for involvement include following procedures outlined in the plan and increased communication with the water system in regards to incidents or general practices. This is relatively cost free way to maintain a community's livelihood.

http://www.epa.gov/safewater/protect/swpbibliography/best-management-practices.html

Additional Management Techniques

- ***Public outreach- education and publications.***
- ***Voluntary land use practices within DWPA.***
- ***Community involvement and volunteer organizations.***
- ***Best Management Practice Needs Assessment- based on stream setbacks per section and activities in close proximity to streams/tributaries.***

BMPs are used to determine methods that are the most productive and applicable for the community in question and the potential contaminants present. Information about the drinking water protection area allows the community to develop management strategies that will have the most impact on protecting the source of the drinking water.

This section of the Drinking Water Protection Plan determines the best management practices associated with those potential contaminant sources according to local land use practices. Section compilation is based on the PCS and its associated risk ranking and the PCS location relative to the DWPA based on Time of Travel (TOT). The PCS is listed with viable BMPs. This section will address High and Moderate risk associated BMPs. Please refer to Lower risk BMPs by using or referring to the SWA and DEQ databases.

http://www.epa.gov/safewater/protect/swpbibliography/best-management-practices.html

4.2: Federal Managed Forest Land/Clear-cuts - *Higher Risk*

BLM: Record of Decision and Resource Management Plan-Medford District

Through the implementation of Best Management Practices, the Bureau of Land Management fulfills the requirement for federal agencies to comply with all State requirements and programs to control water pollution from non-point sources (per Clean Water Act Section 313 and Executive Order 12088). The Bureau of Land Management under a memorandum of agreement with the Oregon Department of Environmental Quality is a "Designated Management Agency charged with implementing and enforcing natural resource management programs for the protection of water quality on federal lands under its jurisdiction" through Best Management Practices.

"The **Aquatic Conservation Strategy** was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands.

- ***Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, up slope areas, headwater tributaries, and intact refugia. These lineages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.***

- ***Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.***

- ***Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.***

- ***Maintain and restore the sediment regime under which an aquatic ecosystem evolved.***

Erosion Control for Timber Harvest:

Water-bars

Objective: To minimize soil erosion.

- ***Construct adequate water-bars on skid roads, yarding corridors, and fire lines prior to fall rains.***
- ***Use the following table for water-bar spacing, based on gradient and erosion class.***

Yarding Methods:

Cable

Objective: To minimize soil damage and erosion caused by displacement or compaction.

- ***Use full or partial suspension when yarding on erodible or ravel prone areas where practical.***
- ***Use full or partial suspension with seasonal restrictions on areas of high water tables.***
- ***Use seasonal restriction if required suspension cannot be achieved by yarding equipment.***
- ***Avoid downhill yarding***.

Tractor

Objective: To minimize loss of soil productivity and reduce potential for surface runoff and subsequent water quality degradation.

- ***In previously un-entered stands, use designated skid roads to limit soil compaction to less than 12 percent of the harvest area.***
- ***Minimize width of skid roads.***
- ***For stands previously logged with tractors, utilize existing skid roads.***
- ***Rip all skid roads used in final entry harvest.***

Helicopter

Objective: To minimize surface disturbance on high risk watersheds.

- ***Employ helicopter yarding to avoid or minimize new road construction in high risk watersheds.***

Horse

Objective: To minimize soil disturbance, soil compaction, and soil erosion.

- ***Limit horse logging to slopes less than 20 percent.***
- ***Construct hand water-bars on horse skid trails according to guidelines in section VIII.B.1.***
- ***Limit harvest activity to times when soil moisture content at a six-inch depth is less than 25 percent by weight***

Re-vegetation of Disturbed Areas:

Objective: To establish an adequate vegetative cover on disturbed sites to prevent erosion.

- ***Use native vegetation that allows natural succession to occur. Avoid interference with reforestation operations.***
- ***Include application of seed, mulch, and fertilizer as necessary.***
- ***Complete prior to fall rains.***

4.3: Highway/Transportation Corridors- *Higher Risk*

Highways are a common Potential Contaminant Source, due to high traffic volumes and associated automotive chemicals and petroleum including Dalapon, Picloram, Simazine, Sodium, Sodium Chloride, and Turbidity. Accidents and spills need to be considered along with maintenance. Roadways are constructed of impermeable surfaces and residual chemicals tend to migrate to permeable where infiltration can occur. All of the following BMPs with the exception of Additional Management Techniques were taken from an ODOT document some portions were omitted that did not directly apply to watershed concerns *(Routine Road Maintenance, Water Quality and Habitat Guide, Best Management Practices, 2004).*

Spill Prevention and Cleanup

Description: Spill prevention and clean up can be required during routine maintenance activities, the operation of equipment and fleet vehicles, events that may occur at maintenance yards, and encountered along the roadways.

Goal: To minimize spills and the impacts to natural resources.

- ***Have absorbents and/or emergency response equipment on-site to clean spills.***
- ***Provide spill prevention training to maintenance employees.***
- ***Clean up spills as quickly as possible. Appropriate training is required for spill containment and clean-up.***

Catch Basin

Goal: To minimize sediment discharges from catch basins and sumps at maintenance yards.

- ***Perform routine inspections per manufacturers recommendations, or annually.***
- ***Clean catch basins and sumps before deposits are deeper than 1/3 the depth from the bottom of the structure to the lowest pipe or opening***
- ***Dispose of deposits in an appropriate location***

Water Quality Facilities (Activity 125)

Description: Activity includes maintaining permanent water quality structures designed and constructed to treat storm-water runoff from ODOT roads and facilities. These structures include detention and retention ponds, grassy swales, holding vaults, etc. Maintenance activities include removing sediment, vegetation, changing filters, holding periodic inspections, grading as needed. Equipment used to maintain these structures include backhoes, vactors, jet rodders, hand tools, etc. Specialty equipment may be used as needed.

Goal: To ensure that the designed facilities for storm-water treatment function as intended.
Minimization, Avoidance, and BMPs:

- ***Implement maintenance procedures described in the operations and maintenance manual developed for the structure.***

- ***Dispose of removed material appropriately above the OHWL or as directed in the Roadwaste Material Management Chart.***

- ***Practice good housekeeping practices during any maintenance activity such as having spill kits on site.***

Accident Clean-up (Activity 149)
Description: Activity includes removal of accident debris, and may include response to hazardous spills. ODOT is responsible for maintaining public safety and working with DEQ contractors or responsible parties to ensure the cleanup is done in an appropriate manner.

Goal: To restore transportation system following unforeseen incidents.
Minimization, Avoidance, and BMPs:

- ***Assess the situation for safety considerations.***

- ***Stop and contain any spill if appropriate.***

- ***Appropriate training is required for spill containment.***

- ***Call Region Hazmat Coordinator or REC for assistance as needed***

- ***Provide traffic control as appropriate.***

Bridge Maintenance (Activity 160,163) Other Structure Maintenance (Activity 169)
Description: Activity is a large category of ODOT Maintenance actions. There are two major categories: drift removal and maintenance of bridges and large (over six feet diameter) culverts. Maintenance and replacement of structures includes washing, painting, scraping and patching of curbs, rails, deck joints, on wood, concrete and steel bridge components. Pesticides are applied to bridges occasionally.

Goal: To maintain and repair the structural integrity of bridges and culverts along state highways in a manner that minimizes impacts to natural resources.

Bridge Cleaning and Maintenance Minimization, Avoidance, and BMPs:

- ***Follow the ODFW Bridge Washing Guidance.***

- ***Implement adequate measures to ensure that paint and other hazardous material does not enter waters of the State. Coordinate guano removal and any other specific concerns with OEQ. Any material which does fall into the water will be removed (if possible) in the least destructive way possible, or left in place if this would be less destructive to fisheries habitat.***

- ***Temporarily block deck drains and scuppers over streams when pressure washing, sandblasting, or scraping structures, to route water off deck and into vegetated areas where practicable.***

- ***Remove debris from bridge decks in a manner that minimizes material entering waterbodies.***

- ***Preferred methods may include removal of large debris from bridge decks with a sweeper or a shovel. Other material may be scraped by hand before being collected, removed (prior to pressure washing). Material will be disposed of as identified in the local disposal plan.***

Temporary Water Management

- ***Obtain temporary water right to pull directly from source or de-chlorinate the water, where required.***
- ***Work with the water source (the city) to identify chlorine levels prior to using water. 3. Screen any intake pump used in this activity per NOAA Fisheries Screening criteria.***

Bridge Repair (Activity 162)

Description: Activity includes repair of bridges and large culverts (over six feet diameter). In-water bridge repair can include repair or replacement of riprap, drainage features, and catch basins and replacement of structural members. Bridges may be constructed of steel, wood, or concrete. Maintenance typically replaces structural elements in kind.

Goal: To maintain and repair the structural integrity of bridges and culverts along state highways in a manner that minimizes impacts to natural resources.

Additional Management Techniques:

- ***Involve ODOT in planning process and establish increased communication procedures.***
- ***Request accident notification between relevant milepost markers on Highway 199 and 46.***
- ***Catch Basins were installed by ODOT along with a barrier wall along Highways 199 and 46***

4.4A: Livestock/Grazing Animals: – *Higher Risk*

Animal waste contains many pollutants that can contaminate surface and ground waters used as drinking water sources. Probably the greatest health concern associated with livestock, poultry, and horse wastes is pathogens. Many pathogens found in animal waste can infect humans if ingested. Organisms like Cryptosporidium, Giardia lamblia, and Salmonella can induce symptoms ranging from skin sores to chest pain. E. coli, which causes diarrhea and abdominal gas, has been the source of disease outbreaks in several States. Particularly virulent strains of E. coli can cause serious illness and even death.

Animal wastes can contribute to **nitrates** in drinking water. Consumption of nitrates can cause methemoglobinemia (blue baby syndrome) in infants, which reduces the ability of the blood to carry oxygen. If left untreated, methemoglobinemia can be fatal.

Companion animals, such as horses used for showing and recreation, and boarding also produce waste that should be accounted for in pollution prevention. Horses raised on hobby farms, while similar to livestock, are managed differently, allowing for alternative prevention measures. The average horse produces about 45 pounds of waste each day, an amount that can be overwhelming to those operating small, suburban horse farms.

Management Techniques:

- ***Proper management of livestock waste includes preventing animals and their waste from coming into contact with runoff and water sources, properly applying waste as fertilizer on crop or pastures, and appropriately managing pastures.***
- ***Clean water diversion is an effective measure that prevents contamination of precipitation or surface flow as it makes its way to drinking water sources.***
- ***Proper storm water management in and around feedlots and livestock yards, including proper protection (or isolation) of agricultural Cave Junction well inlets, is essential to guarding against ground water contamination. Rain gutters and downspouts on animal shelter roofs keep runoff clean by directing precipitation away from manure.***
- ***Another tactic to prevent runoff contamination is to construct superficial diversions, such as earthen ridges or diversion terraces built above the feedlot or barnyard, to direct surface flow away from waste.***
- ***Composting can help eliminate pathogens and reduce the volume of manure. Composting is the controlled biological decomposition of organic materials; it can be aerobic (occurring with oxygen) or anaerobic (occurring with little or no oxygen).***
- ***Composting is perhaps the most common and least costly method of handling livestock waste. Compost sites should be located away from drinking water wells and water sources to avoid leaching during heavy rain.***
- ***Also, piles should be situated on fairly flat sites where water does not collect or run off. Once manure has fully broken down into usable compost, it can be spread as fertilizer, using proper application methods.***
- ***Composting should take place at the correct temperature and for an appropriate length of time to kill the pathogens in the manure.***

4.4B: Livestock Grazing Federal Lands- *Moderate Risk*

Objective: To protect, maintain, or improve water quality, riparian-wetland areas and upland plant communities; to achieve properly functioning riparian ecosystems.

- *Consider fencing springs, seeps, and water developments to protect water quality and riparian ecosystems.*
- ***Ensure rest for plant growth and vigor during the critical growing period.***
- ***Monitor, evaluate, and adjust livestock management practices to meet resource objectives.***
- ***Resolve management conflicts through the development of grazing management plans.***
- ***Promote ecological recovery through appropriate forage utilization levels.***

4.5: Mining/Mineral Development- *Higher Risk*

Objective: To protect surface and groundwater quality and to minimize disturbance to stream banks and riparian habitat within constraints of Department of Interior, Bureau of Land Management surface mining regulations.

Locatable Operations:

- ***Require the claimant to obtain all required state and federal operating permits.***
- ***Comply with seasonal restrictions on suction dredging identified in Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources.***
- ***Locate, design, operate, and maintain sediment settling ponds in conformance with state Department of Environmental Quality (DEQ) requirements.***
- ***Design, locate, and construct stream crossings in conformance with practices described in sections VII.B., VII.C. and VII.D.***
- ***Use existing roads, skid trails, and stream crossings whenever possible.***
- ***Apply rock to roads constructed or reconstructed for vehicular access to the mining area.***
- ***Provide roads with adequate drainage.***

- ***Prior to the first wet season, rip, water-bar, seed, mulch, and barricade according to BLM specifications all roads and trails constructed for exploratory purposes that are unnecessary for the mining operation.***

- ***Construct water-bars and barricade on all natural surface roads and trails when an operation shuts down for the wet season. See section VIII.B.1 for guidelines on water-bar spacing and construction.***

- ***Rip, water-bar, seed, mulch, and barricade all natural surface roads and trails when the operation terminates.***

- ***Construct a berm or trench between disturbed areas and water courses.***

- ***Stockpile topsoil for use during reclamation of the site. Construct a berm or trench immediately down-slope of the stockpile.***

- ***Stabilize and contour the area, replace topsoil and mulch, seed, and plant the area with tree seedlings when no further mining is contemplated.***

- ***During the period from October 15 to May 15, contour and mulch disturbed areas that will not be mined for at least 30 days.***

- ***Confine operations to bench areas rather than allow encroachment on the stream whenever possible.***

- ***Locate and maintain sanitation facilities in accordance with state DEQ regulations.***

Saleable Operations:

- ***Locate stockpile sites on stable ground where the material would not move into streams or water bodies.***

- ***Locate, design, construct, and close roads, landings, and crusher pads in accordance with section VII.***

4.6: New Housing Developments- *Higher Risk*

If properly coordinated, master plans, zoning, and subdivision/site plan reviews can emphasize land use controls that reduce water pollution in two ways. First, the rate of growth and the location and type of development can be controlled through the use of zoning ordinances and comprehensive plans which guide growth in ways that prevent or minimize pollution.

Second, pollution generated by a given type or level of growth can be reduced through subdivision ordinances, special overlay districts and site plan reviews. When properly implemented, land use controls establish development patterns that are consistent with regional water quality protection and other environmental objectives, while still providing for economic development.

Clustering:

Cluster development refers to a compact form of development. In clustering, conventional subdivision lot dimensions are relaxed to allow more dwelling units on one portion of a site and preserve undeveloped space elsewhere on the site.

Open Space Retention:

It has been repeatedly proven that open space is an excellent community investment (Schueler, 1997). the financial investment for land acquisition now is more than repaid through future tax savings realized for not having to provide services, schooling, utilities, etc. to developed land. Property values are enhanced when adjacent to protected natural open space. In addition, ancillary benefits of cleaner waters, less noise, wildlife habitat, and preserved vistas are realized.

The following are examples of action taken to increase the awareness:

- ***Informational pamphlets on consumer's activities, i.e. gardening, watering, use of household hazardous materials, will likely reduce the potential contributing contaminants of the groundwater.***

- ***Articles will be regularly placed in the local newspaper informing local citizens on conservation measures.***

- ***Posters placed in strategic locations throughout the community reminding the consumers of their potential effect on the contamination of the drinking water.***

- ***Regular information should be delved out to the consumers who are using septic tanks, information that instructs on the proper maintenance and pumping schedules for septic tank systems.***

4.7A: Irrigated Crops: - *Higher Risk*

Over application or improper handling of pesticides or fertilizers may impact the drinking water supplies. Excessive irrigation may transport these materials to the ground water/ surface water through run-off.

Management Techniques:

- ***Avoid over-irrigation***
- ***Abide pesticide and fertilizer application guidelines***
- ***Store pesticides and fertilizers in appropriate locations with impermeable surface to avoid spills and leaching.***
- ***Rotate crops for a variance in irrigation needs and reduce water volumes****
- ***Cave Junction Water Association can send information and/or include the property owners as part of their information network to reduce possible contamination occurrences.***

Drip irrigation crops such as vineyards and some vegetable are considered low risk to pollution of drinking water supplies. Since the area of crops is considerably distance (approximately 3000 feet) from the water intake source (well); relative small concern should be applied to the irrigated section of land.

4.7B: Agricultural Land- *Moderate Risk*

If your drinking water protection area includes a significant portion of agricultural land, the Public water system may wish to contact and include the following:

- Local farmers and landowners; (Responsible Management Authorities)
- Representative of Department of Agriculture (local extension office.
- Local Natural Resource Conservation Service;
- Local soil and water conservation district;
- Farm Service Agency;

Management Techniques:

- ***Proper handling and application of chemicals and other controlled substances.***
- ***Proper placement, installations and maintenance of septic systems, wells, storage tanks and wastewater lagoons.***
- ***Proper management of irrigation water.***
- ***Proper placement and management of dairies and feedlots***

4.8: Auto Salvage/Junk yard- *Higher Risk*

Junk / Salvage yards are businesses that for many years were never considered potential threats for drinking water contamination. Many years of collecting automobiles and storing of units are cause for large areas of ground contamination through improper disassembly of parts, leaking automotive fluids. This ground contamination may be a concern to percolation of hazardous materials leaching into the groundwater.

- ***Develop a disassembly area with impervious flooring so to contain spills that can be cleaned up with absorbent or litter.***
- ***Disassembly area should be covered with a shelter roof to divert rainfall away from work area.***
- ***Keep absorbent and / or litter on hand for small spills.***

4.9: Nursery/Fertilizer Storage- *Higher Risk*

Nurseries typically store large quantities of fertilizers and pesticides, both of which pose a potential threat of contamination to drinking water. Many nurseries also contain varying types of foliage that are maintained on premises in a variety of ways. Although each business is unique many of the Best Management Practices associated with nurseries apply on some level.

Runoff and Storm Water Management

- ***Use drip irrigation or intermittent (pulse) irrigation to reduce wasted water.***
- ***Adjust individual sections of the irrigation system to avoid excess watering in some sections.***
- ***Group plants with similar water needs together to improve irrigation efficiency.***
- ***Establish plant buffer zones between production areas and ditches, creeks, ponds, lakes, or wetlands.***
- ***Convert paved or bare soil areas to vegetation that will retard runoff (turf grasses or other comparable plant materials) wherever possible.***
- ***Install and use moisture sensors, such as tensiometers, for more accurate scheduling of irrigation.***
- ***Capture runoff water on site and then recycle it back onto crops, blending it with fresh water as necessary.***

Fertilization Management/Storage

- *Test irrigation water sources three times a year for salt levels, bicarbonates, and pH. Review the results before any fertilizer is added.*
- *Test field soils annually to account for carry-over of nitrogen and other nutrients that might be present. Use this information to determine fertilization levels.*
- ***Purchase pH and EC meters and use them to monitor pH and EC (soluble salts) of the media, soil, and irrigation source water.***
- ***Relocate fertilizers that are stored within 100 feet from water sources.***

Pesticides

- ***Draw up an emergency action plan to contain pesticide spills in mixing and storage areas and to clean up pesticide spills in production areas. Instruct all personnel in the use of this plan.***
- ***Utilize hazardous chemical collection days to get rid of old chemicals. Return empty pesticide containers to dealers.***
- ***Keep records of soil and water tests as a reference for making future pesticide application decisions.***

4.10A: Roads/Maintenance Federal Lands- *Moderate Risk*

Objective: To plan road systems in a manner that meets resource objectives and minimizes resource damage.

Practices:

- ***Use an interdisciplinary process to develop an overall transportation system.***
- ***Establish road management objectives that minimize adverse environmental impacts given the use of the road.***
- ***Avoid fragile and unstable areas or plan appropriate mitigation measures.***
- ***Minimize the percent of the land base converted to roads and landings; avoid heavy concentrations of roads and landings to minimize impacts from increased peak flows and erosion of the compacted surfaced.***

Road Location

Objectives: To minimize mass soil movement, erosion, and sedimentation.

Practices:

- ***Locate roads out of Riparian Reserves where practical alternatives exist.***
- ***Locate roads on stable positions (e.g. ridges, natural benches, and flatter transitional slopes near ridges and valley bottoms).***
- ***Implement extra mitigation measures when crossing unstable areas is necessary.***
- ***Avoid headwalls whenever possible.***
- ***Avoid construction on unstable areas where practical.***
- ***Locate roads to minimize heights of cuts. Avoid high, steeply sloping cuts in highly fractured bedrock.***
- ***Locate roads on well drained soil types.***
- ***Locate stream crossing sites where channels are well defined, unobstructed, and straight.***

Road Closures

Objectives: To prevent erosion and sedimentation of streams from un-maintained roads, and restore site productivity to roads no longer needed.

Practices:

- ***Barricade or block road surface using gates, guard rails, earth/log barricades, boulders, logging debris or a combination of these methods. Avoid blocking roads that will need future maintenance***
- ***(I.e. culverts, potential slides, etc.) with un-removable barricades. Using guardrails, gates or other barricades capable of being opened for roads needing future maintenance.***
- ***Follow-up on road closures to ensure they are maintained in accordance with design criteria.***
- ***Install water-bars, cross drains, cross sloping, or drainage dips if not already on road to assure drainage.***
- ***Till with a winged subsoiler, revegetate for erosion control and site productivity restoration.***

4.10B: Roads/Maintenance Private/State- *Moderate Risk*

As described under the Forest Practices Act and subsequent OARs- 629-625-0000, 629-625-0300, and 629-625-0330

Purpose

Forest roads are essential to forest management and contribute to providing jobs, products, tax base and other social and economic benefits.

OAR 629-625-0000 through 629-625-0650 shall be known as the road construction and maintenance rules.

- ***The purpose of the road construction and maintenance rules is to establish standards for locating, designing, constructing and maintaining efficient and beneficial forest roads; locating and operating rock pits and quarries; and vacating roads, rock pits, and quarries that are no longer needed; in manners that provide the maximum practical protection to maintain forest productivity, water quality, and fish and wildlife habitat.***
- ***The road construction and maintenance rules shall apply to all forest practices regions unless otherwise indicated.***

OAR 629-625-0100- Prior Approval

- ***Conducting machine activity in Type F or Type D streams, lakes.***
- ***In the Northwest Oregon and Southwest Oregon Regions, operators shall obtain prior approval from the State Forester before constructing roads on high risk sites.***
- ***In addition to the requirements of the water protection rules, operators shall obtain prior approval from the State Forester before placing woody debris or boulders in stream channels for stream enhancement.***

Road Design

- ***The purpose of OARs 629-625-0300 through 629-625-0340 is to provide design specifications for forest roads that protect water quality.***
- ***Operators shall design and construct roads to limit the alteration of natural slopes and drainage patterns to that which will safely accommodate the anticipated use of the road and will also protect waters of the state.***

Drainage

The purpose of this rule is to provide a drainage system on new and reconstructed roads that minimizes alteration of stream channels and the risk of sediment delivery to waters of the state. Drainage structures should be located based on the priority listed below. When there is a conflict between the requirements of sections (2) through (6) of this rule, the lowest numbered section takes precedence, and the later-numbered and conflicting section shall not be implemented.

- ***Operators shall not concentrate road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fillslopes***

- ***Operators shall not divert water from stream channels into roadside ditches.***

- ***Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state.***

- ***Operators shall provide drainage when roads cross or expose springs, seeps, or wet areas.***

- ***Operators shall provide a drainage system using grade reversals, surface sloping, ditches, culverts and/or water-bars as necessary to minimize development of gully erosion of the road prism or slopes below the road.***

Currently road maintenance and easements are being researched by the RMAs and the City of Cave Junction to determine responsibilities with respect to specific existing roads. As the research and prior agreements are re-determined they will be incorporated within the appendix.

4.11: Hi-Density/Septic Systems- *Moderate Risk*

High density areas with greater than one house per half acre parcel.
Encourage best management practices such as:

- ***Pump out septic tank solids every 2-3 years;***
- ***Limit use of drain cleaners and phosphate soaps;***
- ***Never use chemical treatments for septic tanks;***
- ***Never pour household hazardous wastes down drains or toilets;***
- ***Information on septic system maintenance or requirements can be obtained by contacting DEQ @ 503-229-5279.***

Develop long term solutions:

- ***Maintain low density housing through zoning or subdivision requirements;***
- ***Consider community sewage collection and treatment system installation.***

4.12: Chemical/Petroleum Processing/Storage- *Moderate Risk*

Chemical Storage and processing plants usually deal with large quantities of materials that are not compatible with water. These facilities can be contacted to insure;

- *secondary containment,*
- *storm water pollution plans;*
- *personnel training on handling and storage*
- *emergency procedures and water system contact numbers*

4.13: Above Ground Storage Tanks (AST)-*Moderate Risk*

ASTs are one of the most prominent PCS present in the DWPA. The majority of storage tanks contain petroleum products (e.g., motor fuels, petroleum solvents, heating oil, lubricants, used oil, pesticides, and fertilizers). Discharges of chemicals, petroleum, or non-petroleum oils from storage tanks can contaminate source water. Product spilled, leaked, or lost from storage tanks may accumulate in soils or be carried away in storm runoff.

- ***Routinely monitor ASTs to ensure they are not leaking. An audit of a newly installed tank system by a professional engineer can identify and correct problems such as loose fittings, poor welding, and poorly fit gaskets.***
- ***Federal AST Requirements under 40 CFR Part 112 Follow standard tank filling practices when filling tanks to prevent spills and overfills.***
- ***After installation, inspect the tank system periodically to ensure it is in good condition.***
- ***Furthermore, all ASTs should have a secondary containment for tanks (with a capacity of 275 gallons or greater) area that contains spills and allows leaks to be more easily detected. The containment area surrounding the tank should hold 110 percent of the contents of the largest tank plus freeboard for precipitation. Secondary containment for ASTs must be impermeable to the materials being stored.***
- ***Methods include berms, dikes, liners, vaults, and double-walled tanks. A manually controlled sump pump should be used to collect rain water that may accumulate in the secondary containment area.***
- ***Any discharge should be inspected for petroleum or chemicals prior to being dispensed.***

4.14: Abandoned Wells- *Moderate Risk*

Prevent pollution of water through unused wells is a BMP for all landowners. Landowners may accomplish this BMP by any of the following appropriate management practices.

Management Techniques:

- ***Landowners may securely seal a well that is temporarily not in use but still in good condition using a watertight cap. The seal prevents both unauthorized access and contamination of the well.***
- ***Cap temporarily unused wells; weld the cap to a metal casing or the equivalent if the casing is plastic or concrete. This is a temporary solution. Capping does not work satisfactorily on uncased wells and hand dug wells.***
- ***Properly seal permanently unused wells.***
- ***Restore an abandoned well for wildlife habitat.***
- ***Practice Drinking water protection around any unsealed well.***
- ***Practice Drinking water protection around a capped well as you would around a functioning well.***
- ***Keep pesticide and fertilizer applications at least 100 feet away from the wellhead.***
- ***Store agrichemicals and animal wastes at least 100 feet from the well.***
- ***Slope the soil surface away from the wellhead.***
- ***Install a concrete pad according to Natural Resources Conservation Service specifications.***
- ***Plant an adapted grass cover around the wellhead. An occasional mowing will keep the weeds down.***

Well Abandonment A Permanent Solution:

Abandoned wells can act as a direct contamination conduit to water.

To abandon a well properly, a well driller must plug or seal the well in such a manner that it will neither produce water nor serve as a channel for movement of water to an underlying or overlying aquifer.

Plugging or filling an abandoned well to make it permanently inoperable and environmentally safe is a complex procedure. It may require special tools. A well driller licensed in Oregon has both the knowledge and tools needed to seal a well properly. Having a well permanently sealed is a moderately expensive procedure, but is necessary to reduce landowner liability for contaminating water. Removing contaminants from an aquifer is impractical and often impossible.

The purification of contaminated drinking water for human and livestock consumption costs more than plugging a nonfunctional well.

Management Techniques:

- ***The well driller usually fills the well with non-shrink concrete, grout, puddled clay or bentonite.***

- ***A well driller applies these materials using a tremie tube, a small diameter pipe inserted into the well during the filling procedure.***

- ***Using a tremie tube prevents water in the well from diluting the fill material, a problem that may occur when using other filling methods. Dilution of the fill materials may prevent an adequate seal.***

- ***Bentonite works best where moisture is always present.***

- ***Concrete works best under dry conditions.***

4.15: Automotive/Autobody Repair Shop- *Moderate Risk*

Improper handling of automotive fluids, solvents, cleaners and repair materials during transportation, use, storage and disposal may impact the drinking water supplies. Washing of shop floors to areas with no drains will eventually contaminate the soils and potentially move to the groundwater supply. Service centers are locations where leaks, spills or improper handling of fuels and other chemicals from vehicle servicing and parking areas may impact the drinking water.

- ***During storms, these materials can be washed away in the storm water run-off or infiltrate into the drinking water source.***

- ***Review of the shop's drainage system, (connected to sanitary sewer or closed) and clean up procedures would ensure materials were NOT coming in contact with soils that may lead to drinking water contamination.***

- ***A covered structure where vehicle service repair occurs will greatly reduce the amount of spilled materials from being carried away with storm water.***

Other Additional Recommended Measures-Lower Risk

Lower Density Septic Systems:
Septic systems are a significant source of ground water contamination leading to waterborne disease outbreaks and other adverse health effects. The bacteria, protozoa, and viruses found in sanitary wastewater can cause numerous diseases, including gastrointestinal illness, cholera, hepatitis A, and typhoid.

Septic tanks and ***Cave Junction fields should be of adequate size*** to handle anticipated wastewater flows. In addition, soil characteristics and topography should be taken into account in designing the Cave Junction field. Generally speaking, the lower the soil permeability, the larger the Cave Junction field required for adequate treatment. Cave Junction fields should be located in relatively flat areas to ensure uniform effluent flow.

Septic systems should be located a safe distance from drinking water sources to avoid potential contamination. Areas with high water tables and shallow impermeable layers should be avoided because there is insufficient unsaturated soil thickness to ensure sufficient treatment. ***Soil permeability must be adequate*** to ensure proper treatment of septic system effluent. If permeability is too low, the Cave Junction field may not be able to handle wastewater flows, and surface ponding (thus contributing to the contamination of surface water through runoff) or plumbing back-ups may result.

Practices:

Since a good portion of the land within the DWPA is farmland the following practices are listed as an addendum for drinking water quality protection as recommended by the EPA and other various agencies. The options listed are possible recommendations for farmers concerned about protection of their drinking water supply.

Crop Rotation
Crop rotation can often yield crop improvement and economic benefits by minimizing fertilizer and pesticide needs. Planting legumes as part of a crop rotation plan provides nitrogen for subsequent crops. Deep-rooted crops can be used to scavenge nitrogen left in the soil by shallow-rooted crops. See the fact sheet on agricultural application of fertilizer for additional information on measures such as laser-controlled land leveling, conservation tillage, and buffer strips.

Proper Manure Application Rates
Proper manure application rates are also important. Applying waste at the time of maximum crop uptake can minimize loss to surface runoff and decrease the amount of manure needed to fertilize crops. Calculating the optimal rate of application also includes ***crediting other sources*** that contribute nitrogen and phosphorus to the soil. Furthermore, appropriate manure application is based on ***yield goals*** established by the crop producers. Yield expectations are established for each crop and field based on soil properties, available moisture, and yield history and management level.

Soil Sampling
Soil sampling is necessary to determine plant nutrient needs and to make accurate fertilizer recommendations.

Pesticides
Source water contamination with pesticides is frequently associated with pesticide handling practices in the vicinity of wells. Wells should be properly cased, capped and grouted. Wells that are not protected act as **conduits** for surface contaminants to Cave Junction into the aquifer. Open wells used near mixing-loading sites are particularly vulnerable to contamination. Grade the area around the Drinking to keep runoff away from the water source
Pesticide spills near wells can move directly and quickly into ground water. Avoid mixing, storing, or disposing of pesticides within 100 feet of a well. Some pesticide labels may recommend greater distances. Properly close all abandoned wells and never dispose of wastes in unused wells.

Integrated Pest Management (IPM)
IPM combines chemical, cultural, and biological control practices into one program to manage pest populations. In an IPM program, pesticide applications are carefully timed and combined with other pest management practices to reduce the need for frequent applications. Identify the pests, determine pest populations and damage, and make pesticide applications only when necessary, using the lowest rate necessary for adequate pest control. Minimizing the amount of pesticide used reduces costs and helps protect the environment. For more information on IPM programs and practices contact Josephine County FSA or Farmers Association.

Store Pesticides Safely
Minimize your pesticide inventory by buying only what is needed for the season or for a specific application. The storage area should be away from all water sources. A sealed concrete floor facilitates clean-up in the event of a spill or leak. Inspect containers regularly for leaks and corrosion. Bulk pesticide storage tanks should be inspected frequently and placed on concrete pads with dikes built around them to prevent the movement of pesticide if there is a spill or leak.

Prevent Spills
Contain and clean up spills immediately. Repeated pesticide spills in the same area, such as mixing and loading sites, may exceed the capacity of the soil to adsorb or degrade the chemical and may increase the likelihood of ground water contamination.

All of the information listed is available free of charge on the Internet or via one of the referenced agencies. Contact the Natural Resources Conservation Service (NRCS), Conservation District, and Agricultural Extension Service representatives in your area. They can provide more information on nutrient management and cost-share programs, such as the Environmental Quality Incentives Program (EQIP), the Conservation Reserve Program (CRP), and the Conservation Reserve Enhancement Program (CREP), to assist in financing source water protection measures.

Section 5: Implementation

The Team should designate a timeline for implementation of each BMP and an agenda should be agreed upon. Local resident notification and involvement via attendance of meetings and use of BMP's should be based upon community ability and applicability.

However, if a BMP is included within the plan the community should know prior that a failure to implement the action will affect the validity of the plan in terms of success or certification. A true measurement of success in regards to source water protection is not incurring a contamination event. Although many of the practices are abstract in nature, the overall quantity of the audience can be a gauge of information reaching the public concerned. The more vision and drive a community has, the better off their water source will be. The plan is a living document and therefore needs to be assessed periodically; at least once a year.

5.1: BMP Implementation Schedule

The following timeline for implementation and subsequent agenda should be followed by the DWPT and Cave Junction PWS. Local resident notification and involvement through the attendance of meetings and use of BMPs will be pursued according to community ability and applicability. Due to the fact that this plan is a living document the need to periodically review and implement detailed or new practices will be necessary for continued plan development.

1. Responsible Management Authority (RMA) letter mail out, a description of DWPP process.

2. The Inclusion of Responsible Management Authorities to participate in the planning process via DWPT meetings to increase communication and acceptance of the plan.

3. Sign off by each RMA or description of notification

4. City Council adoption of DWPP

5. Mail brochures with CCRs/Post flyers at City Hall to inform residents about the DWPA. Promote ownership in protecting the drinking water source from contamination

6. Post signs (Entering DWPA) at perimeters of the area, I.e.

7. Education- hold a DWPP (town hall style meeting) to inform residents and let them express concerns and questions regarding the area and BMPs.

8. Student Awareness- contact school district or local elementary/middle school to present some drinking water protection class material to inform students. This approach would also extend to adults via interaction with their children.

9. Community Outreach through local groups I.e. Boy scout information canvas, stencil storm drains.

10. DWPA Campsite Postings

11. Inclusion of Surface Water DWPA by City Council-addendum to Ordinance 452

Table 5.2: BMP Implementation Synopsis

Best Management Practice	Implementation Status
1. RMA Informative Mail-out	Completed
2. RMA DWPT inclusion	Completed/Continued
3. DWPP Adoption by City Council ORD:452	Completed
4. Inclusion of Surface Water DWPA by City Council-addendum to Ordinance 452	Completed
5. Student Outreach-water plant tours	Completed/Continued
6. Obtain RMA Signatory Status	
7. Education- Hold meeting Town-hall venue	
8. Boy-scout Outreach/Program	
9. Post DWPA information at campsites	
10. Post signs	
11. Mail informational flyers with CCRs	
12. Promotion and incorporation of FSA programs to protect water sources on farmland within watershed.	
13.	
14.	

5.3: Future System Projections/Plans

With new development in the area, water connections could increase approximately twenty five (25) percent. The reservoir capacity for the City of Cave Junction is 2.33 million gallons; with a daily summertime average usage to be approximately 680,000 gallons; which gives the consumers approximately 3.4 days of water supply in the event of a disruption in water supply or contamination found in the water supply.

The future expansion of service to the town of Kerby with 90-150 new connections will increase the scope of the Cave Junction PWS. With this expansion the need for increased storage will be necessary to maintain a proper reserve amount in the event of an emergency or source interruption.

Section 6: Contingency

In the Pacific Northwest the possibility of a disaster occurring should be considered and addressed through preparation and planning. Natural geologic catastrophes may be placed into five categories: floods, landslides, earthquakes, volcanic eruptions, and tsunamis. All five of these catastrophes have occurred in Oregon within the past century.

Quite often the effect of two or more events occurring simultaneously greatly emphasizes the destructiveness of the incident. Floods are nearly always accompanied by landslides, mudflows are often a significant part of volcanic activity, and a major quake following a flood results in a multitude of large and small landslides. Earthquakes in coastal areas frequently precede tsunamis. Although not all of these current are threats, several of the aforementioned scenarios are applicable. Four of the potential episodes are addressed in this section of the DWPP.

The City of Cave Junction's contingency plan addresses the ten (10) elements required by the Oregon drinking water protection program, including:

1. **Potential Threats to drinking water supply**
2. **Protocols for incidence response**
3. **Prioritization of Water Usage**
4. **Key personnel and development of a notification roster**
5. **Short-term and long-term replacement of water supply**
6. **Short term and long term conservation methods**
7. **Plan testing, review, updates**
8. **Personnel training**
9. **Provisions for public education; and,**
10. **Logistical and financial resources**

The need for preparation in the event of a catastrophe or even small scale incident is the most evident during that crisis. Although the variable nature of these occurrences dictates preparation for a wide scale of possibilities, the underlying framework of the Contingency Plan will provide redundant processes for the several scenarios with only a need for slight modification based on the appropriate contacts involved. To further enhance this section of the Contingency Plan, portions of the State of Oregon Natural Hazard Mitigation Plan were included to supplement certain hazard scenarios.

6.1: Potential Threats to Drinking Water System:

- ***Mechanical issues, Power Loss, Broken Main or pipe, Pump failure, system storage capacity exceeded by storm or failure***
- ***Flood, Seismic Disturbance***
- ***Contaminant detected at intake***
- ***Spill within 8 Hour TOT zone (primarily Chemical or Petroleum)***
- ***Storm Event (Mudslide, slump, debris flow)***
- ***Large increase of sediment due to event***
- ***Terrorism/Vandalism, Disgruntled Employee***

6.2 Incident Response Protocols:

6.2A: Mechanical Issues

In the event of a **mechanical interruption,** the City of Cave Junction's public water system will rely on reservoir capacity of **2.33 million** gallons. For the time being, an evaluation of the size of the reservoir in terms of future capacity requirements will be studied. In the event that a longer term interruption has been determined, then mandatory water conservation measures along with transportation of water from an outside source will be implemented. The City of Cave Junction's Daisy Hill well is actually a secondary supply source, which allows them the convenience of having a supply of water from two distinct supply sources.

- ***In the event of a power failure, call the power supplier to determine the longevity / extent of the outage;***
- ***In the event of a pressure loss situation or leak, locate the problem, make adjustments or repairs, and disinfect the system and place back in service.***
- ***Rely on storage capacity of 3.4 days of usage.***
- ***Make telephone numbers of local equipment Rental Company to obtain back up power supply available.***
- ***Apply water conservation measures.***

6.2B: Flood

Flood risk or probability is generally expressed by frequency of occurrence. It is measured as the average recurrence interval of a flood of a given size and is stated as the percent chance that a flood of a certain magnitude or greater will occur in any given year. FEMA's National Flood Insurance Program is based on the risk associated with a "100-year" or base flood (Figure FL-1). This is a flood that has a 1% chance of occurring in any year or a 26% chance of occurring during the life of a 30-year home mortgage.

Existing flood mitigation programs and strategies are principally the responsibility of DLCD, BCD, and OEM. In addition to state programs, the National Flood Insurance Program (NFIP) of the Federal Emergency Management Agency is designed to help minimize flood losses through floodplain management. The NFIP relies on insurance, mortgage lending requirements, and floodplain development standards to reduce flood losses. **Refer to section Sections 3.1 E floodplain data, and 3.1F for the Illinois Valley/Cave Junction Area 100 year Flood Map.**

Goal 7 of the statewide planning goals, administered by DLCD, requires local governments to adopt flood protection policies and controls. DLCD also administers the NFIP in Oregon, and every community with identified flood hazards is a member of this program. Thus, these local governments are required to adopt the NFIP's minimum requirements. The NFIP is comprised of a flood hazard mapping component, an enforcement component, technical assistance, and insurance which provides a financial safety net for owners of improved property. Together, all four components of the NFIP work together to reduce flood losses (*State of Oregon Natural Hazards Mitigation Plan, June 2000).*

6.2C: Seismic Disturbance

Oregon ranks third in the nation for future earthquake damage estimates. Projected losses in the Northwest could exceed $12 billion, with over 30,000 destroyed buildings, and 8,000 lives lost in the event of a magnitude 8.5 Cascadia Subduction Zone earthquake. *

The largest historical earthquake in Oregon occurred on November 23, 1873 near the California border at the coast, estimated at M 6.8. Property damage occurred in Crescent City, Port Orford, Grants Pass and Jacksonville. The earthquake was felt in Portland and San Francisco. The earthquake may have occurred in the subducting plate of the Cascadia Subduction Zone.

Additional events include the July 16, 1936 earthquake (M 6.1) near Milton-Freewater, the recent March 25, 1993 M 5.6 Scotts Mills event and the September 21, 1993 M 5.9 and 6.0 Klamath County events. Portland also experienced an earthquake on November 6, 1962 (M 5.5). Damage was not major, but a large population felt the quake. The historical record only represents a fraction of the earthquakes Oregon has experienced. The short written history does not include the great Cascadia Subduction earthquakes, the latest of which is believed to have occurred in January 1700.

- ***Assess the intake, storage facilities, control panel, and chlorination facilities for damages;***
- ***Determine if water within the reservoir and distribution system is contaminated;***
- ***Test water within the distribution system to ensure untreated flood water is contained;***
- ***If necessary issue water boil notices;***
- ***Implement conservation/curtailment plan;***
- ***Notify residents and businesses of contamination and conservation/curtailment plan;***
- ***Address damages, provide water to customers and notification if necessary;***
- ***Refer to alternative sources in section 6.5***

6.2D: Contaminant Detected at Intake

Response to detection of contaminant(s) at the constructed intake depends on whether the substance reaches or exceeds the Maximum Contaminant Level (MCL) as measured during the monitoring process. The MCL is considered the maximum concentration that a contaminant can be present, yet below the MCL, quarterly monitoring should occur to assess the status of the contaminants concentration through time. If the contaminant is reaching or exceeded the MCL, then these measures should be taken by the Cave Junction (PWS) # 4100971.

- ***Shut down the treatment plant and distribution system:***
- ***Determine extent of contamination;***
- ***Try to assess the origin of contamination, if the cause is backflow contamination, will necessitate shut down of appropriate area;***
- ***Implement containment procedures to prevent it form spreading throughout the entire distribution system;***
- ***After containment flush the contaminant from the system, test, disinfect and place back in service if possible;***
- ***Implement conservation/curtailment plan;***
- ***Notify residents and businesses of contamination and conservation/curtailment plan;***
- ***Send news release to local media;***
- ***Notify State/County Regulatory agencies and local fire department, (Department of Human Services-Drinking Water Program, Department of Environmental Quality, Josephine County Public Health Department/Emergency Management Services and Josephine County Sheriff Department);***
- ***Cooperate with agencies investigating the containment;***
- ***Secure alternate water source as specified in section 6.5;***
- ***Emergency procedures outlined in Cave Junction Emergency Response Plan and Josephine County Emergency Response Plans shall be followed;***
- ***Determine cost of treatment***

6.2E: Spill within Watershed (Primarily Chemical or Petroleum)

A timely appropriate response is based on the TOT zone the spill is located in. The closer the proximity of the spill in relation to the watershed determines the immediacy of the response. The following section detail the measures needed if a spill occurs.

- ***Call 911 to report the spill and inform them it occurred within the DWPA;***
- ***Survey the area with minimal risk to personnel;***
- ***Contact the Department of Environmental Quality or the Oregon Fire Marshall to evaluate the type of Chemical/Petroleum spilled and determine proper clean-up;***
- ***Follow the communication procedures contained in Section 6.4 ;***
- ***Implement conservation/curtailment, if needed;***
- ***Upon notification of spill evaluate need for shut down of intake;***
- ***Inform media to notify residents and businesses***
- ***Testing chemicals within 6months and according to timeframe***
- ***Coordinate with state agencies regarding communities extended role;***
- ***Leave clean-up to responsible parties;***

6.2F: Fire

Forests play an important role in the economy of the county, as well as surround its resident's homes and businesses. Wildfire is serious threat to the well being and quality of life in the Illinois Valley.

- ***Call 911 to report the fire and inform them it occurred within the DWPA;***
- ***Survey the area with minimal risk to personnel;***
- ***Oregon Fire Marshall, to evaluate the extent of the problem and determine proper clean-up;***
- ***Implement conservation/curtailment, if needed;***
- ***Upon notification of fire determine the need for shut down of intake;***
- ***Inform media to notify residents and businesses***
- ***Coordinate with state agencies regarding communities extended role;***
- ***Leave clean-up to responsible parties;***

6.2G: Terrorism/Vandalism

The reaction to a Terrorist/Vandalism event should be based on the severity of the event. The enclosed protocols should be put into action immediately. A lethal contaminant added to the drinking water would constitute a worst case scenario.

- ***The water treatment plant should be shut down immediately and as identified in Section 6.2C;***
- ***Notify local media;***
- ***Implement water conservation measures as per section 6.6;***
- ***Contact local, county, state, and federal authorities as identified in Section 6.4;***
- ***Locate an alternate source for water, if needed, as detailed in section 6.5;***
- ***Aid regulatory agencies in their investigation as needed;***

6.3: Prioritization of Water Usage

This section of the contingency plan establishes the priority of water usage in the event the supply has been interrupted or contaminated, producing a need for replacement. Existing storage totals 1,251,000 gallons with a 750,000 gallon steel tank on the southwest edge of the city and a 501,000 gallon steel tank on the southeast edge of the city. If a shutdown event occurs, these are the priority parameters from highest to lowest:

- **Residential use only (no vehicle washing, or lawn watering etc.)**
- **Fire Department**
- **Commercial use**
- **Agricultural use**
- **Other**

6.4: Emergency Protocol

In an emergency situation that threatens the water supply, key personnel should be notified and response protocols coordinated between Cave Junction Public Water System 4100971, county, state, and other agency personnel. These response protocols will help define the necessary steps required by personnel to communicate with Fire, Police and management authorities in the case of an emergency.

1. **Place call to 911**
2. **Relay relevant information, name, phone number**
3. **Describe problem and when it occurred/was discovered**
4. **Give authorities name of system administrator**
5. **Determine the scope of the affected area**
6. **Inform them of which agencies have been contacted**
7. **Actions taken to address the situation**
8. **Timeframe of delay**
9. **Notify customers or delegate notification**

After notification to 911 is made:

- ***The necessary authorities will be notified (Police and Fire Dept.)***

- ***The first respondent should become the incident commander. Normally the initial respondent will proceed with this role. As incident commander they will notify the Oregon Emergency Response System and the HAZMAT Team. Delegation of Incident Command may be required based on resources and the situation.***

- ***Any spill within the DWPA should require notification of the incident to the System Administrator and or Pubic Works Official.***

- ***Incident Commander should assume responsibilities for all agencies based inter-agency collaboration.***

Table 6.4A: Key Emergency Contacts and Notification Roster		
Paul Anderson	541-592-3254	Operates PWS, coordinate public notifications, notify incident commander about DWPA and PWS.
		Coordinates and makes necessary decisions regarding system and resources. Notify incident commander.
		Operator of record, could notify incident commander about PWS and DWPA, as well as notify OAWU.
		County Emergency Response contact: Provide coordination assistance and possible incident command or delegation of duties based on incident.
		Provide the Manager with technical assistance regarding PWS.
		Possible incident commander, should determine which personnel will respond and notify other county and state agencies
		Possible incident commander, assistance in emergency situations and fire/disaster response and clean-up.
		Provide the Manager with technical assistance regarding PWS
		Provide the Manager with technical assistance regarding PWS and hazardous material clean-up, could mobilize and coordinate response team based on necessity
		System repairs
		Provide the Manager with technical assistance regarding PWS
		Provide the Manager with technical assistance regarding PWS
		Provide RWA with emergency water supply along with technical assistance.
		Provide RWA with emergency water supply along with technical assistance.
		Provide the Manager with technical assistance regarding PWS
		Parts supply for water system needs
		Water testing, chemical analysis
		Material supply for various system needs

Table 6.5: Identification of Short/Long Term Water Supply Replacement
In the event of an emergency interrupting Cave Junction PWS water supply, the community's minimum needs are a priority and provisions for health needs must be considered.

SHORT TERM	INTERMEDIATE	LONG TERM
Water Conservation	Water Conservation	New Well/Aquifer
Water Curtailment	Water Curtailment	Emergency Back-up well
Bottled Water	Bottled Water	
National Guard Tanker	National Guard Tanker	
Emergency Back-up line	Emergency Back-up line	

Table 6.5 Duration Definitions:
Short-term: can range in duration from hours to a few days.
Intermediate: can range from a few days to several weeks.
Long-term: are permanent options

6.6: Identification of Short and Long Term Conservation Measures

Water conservation is a key element to reducing the strain on the system during an emergency. These recommendations should be executed when the system undergoes a disruption of service. These measures should be used in accordance with the replacement options from section 6.5.

Categorized Conservation Measures:

- **Municipal:** Activities requiring water shall be deemed vital and typical operations will be altered or ceased.
- **Residential:** Residents will restrict water usage to only drinking and food usages. Typical conservation methods include lawn watering and vehicle washing being suspended.
- **Commercial:** Water usage should be restricted to only businesses providing food preparation or health provisions.

Conservation Measures:

- ***Premises having odd numbered street addresses use only on certain time of day.***
- ***Premises having even numbered street addresses use only on certain time of day.***
- ***Recommended that no potable water from the City's system shall be used for construction purposes such as dust control, compaction, or trench jetting***
- ***Landscape irrigation shall be reduced or not be allowed based on scope of interruption.***
- ***Based on need, industrial users are required to reduce or cease all water use, subject to evaluation.***
- ***Facilitate a preventative conservation plan for businesses in the area.***
- ***Distribute mail-out flyers with statements, to inform residents about conservation needs during emergencies.***

Additional Recommended Strategies:

- ***Follow Emergency Response Plan Procedures***
- ***Increase existing water storage.***
- ***Obtain additional water supplies.***
- ***Determine where funding for additional water supplies will come from.***
- ***Contact and coordinate with other agencies.***
- ***Create an Emergency Response Team/Coordinator.***
- ***Develop additional methods to communicate with the public.***
- ***Develop additional methods to prepare for water quality interruptions***

6.7: Plan Testing, Review, Update

The Contingency plan should be reviewed and updated by the designated personnel on an annual basis. A true assessment of the plan can be accomplished by performing an emergency drill and then evaluating the performance of operations and communication. However, this is a time consuming process and requires manpower to be effective. This process could also be accomplished after an emergency scenario has occurred.

6.8: Personnel Training:

For a contingency plan to be successful the need for accurate information is critical. County and Agency staff are trained in HAZMAT response. However, most systems cannot incur the cost of training staff in containment and many are not staffed for such occurrences. Staff can be knowledgeable in the operation of system equipment used during emergency response.

The system staff should also be able to relay any pertinent information contained within this report to state and local emergency response incident commanders and staff. Once the initial Emergency Response Plan is written it can be upgraded and evaluated via exercises. This occurs through the use of table top exercises and real-world mock exercises that test the procedural knowledge of the city staff and associated agencies. It is under strong recommendation from OAWU Source Water Specialist that the continued upgrading and evaluation of the ERP/Contingency Plan take place periodically to avoid an incident and reduce stress on the PWS and all those involved.

6.9: Provisions for Public Education

Public Education is an invaluable tool which can provide a community with the necessary tools to prevent future contamination through awareness of the source water protection area. If education is used additionally as a basis or preparation, residents of the water system service area will prove for better system management in the case of emergency and contingency response. An informed customer base will be ready and able to address an emergency situation. Preconceived conservation and curtailment strategies can be implemented with only standard notification, saving valuable time and water supply in the event of a service interruption. An informal brochure or flyer can serve to inform system users of measures and plans for contamination.

6.10: Logistical and Financial Resources

Based on the scope of the emergency, the City of Cave Junction should respond to a situation with available resources to the point of providing assistance and information in respect to the DWPA and the water system. The City of Cave Junction will not necessarily attempt clean-up of a spill or applicable small scale disaster on its own. It is possible that some form of containment or mitigation would be needed in certain situations. However, normally the responsible party is required to clean-up and contain any petroleum or chemical spill occurrence.

There are some existing avenues if funding is required beyond what the City of Cave Junction can provide. Some possible alternative funding examples are as follows;

- **Federal and State emergency funds**
- **Bond measures**
- **Future/ Additional allocation of city funds**

Section 7: Emergency Response Plan-(ERP)

This contingency plan is developed for the Source Water Protection program in response to a disruption of water or contamination of the water supply. In an effort to produce a thorough document, it is the intent to disclose as much information in order to mitigate the problem should such event occur. The **Emergency Response Plan,** an addendum of the contingency plan will outline the procedures written in the Oregon Administrative Rules 333-061-0064 / Emergency Response Plan and Water System Operations Manual.

- ***Assess situation***
- ***Identify the problem source***
- ***Notify appropriate parties in accordance with OAR-333***
- ***Seek and propose solutions***
- ***Take action***
- ***Monitor and evaluate results***
- ***Notify residents/customers and proper authorities of evaluated results***

7.1 Oregon Administrative Rules (OARs)

333-061-0064 (1) (a) (C):
For City of Cave Junction's Water System, the population served by the water system is 1440 consumers through 629 connections; the implementation of the plan shall be completed by September 20, 2005, reviewed and updated annually.

333-061-0064 (1) (b):
The City of Cave Junction shall submit a statement to the Department of Environmental Quality outlining that the Emergency Response Plan has been completed and instructed in the use of the emergency response plan.

333-061-0064 (1) (d):
The Responsible Management Authority shall coordinate with the lead County Emergency Coordinator when preparing or revising an emergency response plan.

333-061-0064 (1) (e) (A) (i) (ii) (iii):
The emergency response plan shall include but is mot limited to the following elements:

- ***Develop an emergency contact list, and review and update the list at least, annually.***
- ***Decision making authorities and responsibilities of water system personnel shall be determined and detailed in the emergency response plan.***
- ***Procedure for notification of agencies, water users and the local media.***

333-061-0064 (1) (e) (C) (i) (ii):

- ***Public water systems shall conduct an inspection of the water system annually to identify the hazards that could affect the water system.***

- ***Public water systems shall correct construction deficiencies to eliminate hazards, correct major sanitary survey deficiencies as determined by the Department of Human Services and perform regular maintenance.***

333-061-0064 (1) (e) (D) (i) (ii):

- ***If the water system is not gravity, then provisions shall be made for an auxiliary power supply, and redundant equipment for critical components.***

- ***Public water systems shall develop a plan for emergency water to include the rationing of drinking water, identifying and utilizing alternative drinking water sources and supplies, and alternative distribution of drinking water.***

333-061-0064 (1) (e) (E) (i) (ii) (iii)

- ***Public water systems shall develop procedures for responding to emergencies most likely to strike the water system. Plans and procedures shall be implemented in the event of a terrorist or other intentional attack on the water system.***

- ***The emergency response plan shall describe procedures to isolate all parts of the water system. Community water systems shall develop actions and procedures which can render harmless or significantly lessen the impact of terrorist attacks or other intentional actions on public health and safety and supply of public drinking water.***

333-061-0064 (1) (f):

- ***Water system staff shall be instructed and trained in the use of the emergency response plan.***

333-061-0064 (2) (a) (b) (c):

- ***The water system operations manual shall be completed according to the requirements of the capacity assessment or sanitary survey and shall be reviewed and updated at least every five (5) years.***

- ***As evidence of completion, public water systems shall submit a statement to the Department of Environmental Quality certifying the water system operational manual has been completed according to the requirements in this rule, and that the staff has been instructed in the use of the water system operations manual.***

- ***The public water systems operations manual shall include, if applicable:***
  - Source operation and maintenance.
  - Water treatment operation and maintenance.
  - Reservoir operation and maintenance.
  - Distribution system operation and maintenance.
  - Written protocols for on-site operators describing the operational decisions the operator is allowed to make under OAR 333-061-0225.

OAWU DISCLAIMER OF LIABILITY

This format of the drinking water protection plan (DWPP) is written ONLY as a guide to better enhance and assist the public water system in the protection of their water source from contamination that is either potential or probable. Information placed in the plan has been gathered from a number of sources. It is by no means steadfast, but subjective on the basis of information gathered at the time of completion.

The resources used and ideas expressed in the DWPP are not all inclusive to the number of management options that can be available through other resources. Many of the guidelines quoted are verbatim in terms of Oregon Administrative Rules (OARs), the Forest Practices Act, BLM Record of Decision and/or Management plans. Referenced Source Water Assessment material is a matter of public record and should be noted accordingly. All these referenced resources were used to compile a multi-faceted document that will aid in the protection of the water source.

The information enclosed in this plan, or how it is used is by no means legally binding in terms of liability to Oregon Association of Water Utilities current or previous staff and board members.

The Source Water Specialist will continue to assist the public water system when called upon for implementation of the plan, further guidance in organization of outreach efforts, and updated information.

Shawn Stevenson
Source Water Specialist
OAWU

Appendix A:

1. **References Cited and Resources**
2. **Abbreviations**

Appendix A1: References Cited and Resources

Aquatic Conservation Strategy, Attachment A to the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within Range of the Northern Spotted Owl, p. C-32.

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Oregon Weather Book, George Taylor & Raymond Hatton. Explanations and photos of significant weather events and phenomena in Oregon, 2004

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Oregon Department of Environmental Quality, 1996. Oregon Wellhead Protection Manual: Public Advisory Plan. October 1996.

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Water Words Dictionary Department of Conservation and Natural Resources, August, 2000.

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Appendix A2: Abbreviations

BMP-	Best management practices
CCD -	Census County Division
CCR -	Consumer Confidence Report
CERCLA -	Comprehensive Environmental Responsibility Compensation and Liability Act
cfs -	Cubic feet per second
DEQ -	Department of Environmental Quality
DHS-DWP-	Department of Human Services – Drinking Water Program
DOGAMI -	Department of Geology and Mineral Industries
SWPA -	Drinking Water Protection Area
E -	East
ECSI -	Environmental Clean-up Site Information
EPA -	Environmental Protection Agency
FPA -	Forest Practices Act
ft -	Feet
ft/day -	Feet per day
gpd -	Gallons per day
gpm -	Gallons per minute
HAZMAT -	Hazardous material Handlers
HWIMSY -	Hazardous Waste Management Information System
HWY-	Highway
IP -	Infiltration potential
IOC -	Inorganic compounds
MCL -	Maximum contaminant level
mg/l -	Milligrams per liter
MP -	Mile Post
MSDS -	Material Safety Data Sheets
N -	North
NOAA -	National Oceanic and Atmospheric Administration
NPDES -	National Pollutant Discharge Elimination System
NPL -	National Priorities List
OAR -	Oregon Administrative Rule
OAWU -	Oregon Association of Water Utilities
ODA -	Oregon Department of Agriculture
ODF -	Oregon Department of Foresty
ODFW -	Oregon Department of Fish and Wildlife
ODOT -	Oregon Department of Transportation
OR-OSHA -	Oregon Occupation Safety and Health Administration
ORS -	Oregon Revised Statute
OSFM -	Oregon State Fire Marshal
OSP -	Oregon State Parks
OWRD -	Oregon Water Resources Department
PCS -	Potential Contaminant Source
PWS -	Public Water System

RCRA -	Resource Conservation and Recovery Act
RMA -	Responsible management authority
S -	South
SOC -	Synthetic organic compounds
SWA -	Source Water Assessment
SWPA -	Source Water Protection Area
SWPP -	Source Water Protection Plan
TOT -	Time of travel
TP -	Transverse potential
USEPA -	United State Environmental Protection Agency
USGS -	United States Geological Service
VOC -	Volatile organic compounds
W -	West
° -	Degree
” -	Inches
< -	Less than
> -	Greater than
‘ -	Feet

Appendix B: Flyers, Brochures, Documents

Drinking Water Protection Meeting: Cave Junction OR, 9-20-05

Introductions:

Shawn Stevenson Source Water Protection Specialist OAWU, Tim Tice Groundwater Tech OAWU, Paul Anderson Cave Junction Water System Operator, Steve Bethke Cave Junction operator/staff, Michael Bollweg Illinois Soil Conservation District/Wastewater operator, Tammy Maher Cave Junction Wastewater operator, Kris Sherman IUFD, Pam Bodie USFS, Sue Gries ODEQ, Donna Finch USDA FSA.

Shawn Stevenson:

Discussed the role of the SWP Specialist in terms of offering technical assistance, compilation of data, plan writing, guide for implementation process, and role as facilitator of this meeting and the Source Water Protection Plan.

Purpose of the plan was discussed

- Protect the water source from contamination.
- Maintain sustainability of the community.
- Promotion of communication between watershed stakeholders and water system.
- Premise of the plan is based on a community fitment approach.
- Goals must be realistic and achievable without causing burden on stakeholders or water system.
- Responsible Management Authority (RMA) definition/discussion
    - **BLM**
    - **City of Cave Junction**
    - **Illinois Valley Soil Conservation District**
    - **Josephine County**
    - **ODOT**
    - **Oregon State Parks**
    - **USFS**
    - **USDA-FSA**
    - **Waldo Mining Association**

Tim Tice:

Discussed the delineation portion of the are and associated groundwater plan that accompanies the large scale surface water portion.

- Delineation techniques-identification of water sources
- Susceptibility Analysis-sensitivity by area and location of PCS
- Potential Contaminant Sources (PCS)-inventory of and methodology in identification of.

Shawn Stevenson:

Overview of plan content discussed by section with the majority of discussion stressing Best Management Section 4.0 and associated strategies included.

- Different approaches- Aggressive vs. Non-Aggressive
- Implementation Schedule of suggested BMPs
- Contingency Plan and Emergency Response

Round table discussion opened up for plan input and evaluation:

Pam Bodie USFS:

She discussed what USFS roles in terms of forest management, upcoming harvest activities and a pending management plan. Suggestions of RMA inclusion were made for plan enhancement based on the private harvesters manage several plots and parcels within the watershed:

- Perpetual Forest
- Indian Hills

Sue Gries:

She discussed how more could be requested of the RMAs to ensure plan success along with some additional communication procedures.

Michael Bollweg:

He discussed that he could help promote the plan through the Soil Conservation District to help get public buy in.

Donna Finch:

Gave an overview of several of the FSA programs, CREP etc, which stemmed a conversation of incorporating the local farmers to buy into the protection plan process along with some FSA programs.

Shawn Stevenson:

Stated that the inclusion of outreach and CRP program is intended within some of the plan content and that bringing the local farmers into the action group for implementation purposes would help further advance protection purposes, even if it was on just an informational level.

He stated that promotion of *ownership* throughout the community and in the watershed is key since their health is directly affected by activities within the watershed is a major goal of the plan process.

Group discussion:

Future Plan aspects and next steps associated with maintaining momentum with the plan. These included:

- Outreach to newly identified RMAs
- Next meeting date
- Plan mailout to RMA for review, approval and Sign off.
- USFS would most likely only be able to create an MOU vs. Signing off on the plan.
- Community strategies
- Council Adoption and future presentation of plan content by Source Water Specialist
- Attending future Soil Conservation District Meeting for outreach purposes.

Meeting adjournment:

ORDINANCE NO. 452

AN ORDINANCE ADOPTING A GROUND WATER PROTECTION AREA, SURFACE WATER PROTECTION AND WELL HEAD (DRINKING WATER) PROTECTION PLAN.

WHEREAS, the City of Cave Junction determined the need to protect the public water supply for those it serves; and

WHEREAS, the City of Cave Junction, in conjunction with the Oregon Association of Water Utilities, developed a Wellhead (Drinking Water) Protection Plan;

NOW THEREFORE, THE CITY OF CAVE JUNCTION ORDAINS AS FOLLOWS:

Section 1. Title 13 of the Cave Junction Municipal Code is amended to include Chapter 13.12, Ground Water Protection, which is attached hereto as Exhibit "A".

Section 2. Title 13 of the Cave Junction Municipal Code is amended to include Chapter 13.16, Surface Water Protection, which is attached hereto as Exhibit "B".

Section 3. The Wellhead Protection Plan, attached as Exhibit "C" of this ordinance, is hereby adopted by the Common Council of the City of Cave Junction.

Section 4. Should any section or provision of this ordinance be declared invalid, such decision shall not affect the validity of the ordinance as a whole or any other part thereof. A determination that any portion or provision of this Ground Water Protection Area is invalid shall not invalidate any special permit previously issued thereunder.

PASSED by the Common Council of the City of Cave Junction this _____ day of _____, 2004.

SUBMITTED TO AND APPROVED by the Mayor of the City of Cave Junction this _____ day of _____, 2004.

Signed: _____
ED FAIRCLOTH, Mayor

Attest: _____
CHARLES J. POLK, Recorder

Chapter 13.12

GROUND WATER PROTECTION

Sections:

13.12.10 Purpose. The purpose of the Ground Water Protection Area is to protect the public water supply in the City of Cave Junction and to those it serves from land uses which pose a threat to the quality (and/or quantity) of the ground water being extracted from the well(s) which serve this public water system.

13.12.020 Definitions. For the purposes of this section, the following terms are defined below:

"Aquifer": A geological formation, group of formations or part of a formation composed of rock, sand or gravel capable of storing and yielding ground water to wells and springs.

"Contamination": An impairment of water quality by chemicals, radionuclides, biologic organisms, or other extraneous matter whether or not it affects the potential or intended beneficial use of water.

"Development": The carrying out of any construction, reconstruction, alteration of surface or structure or change of land use or intensity of use.

"Facility": Something that is built, installed, or established for a particular purpose.

"Grey Water": All domestic wastewater except toilet discharged water.

"Ground Water Protection Area": The zoning district defined to other zoning districts in the jurisdiction of the City of Cave Junction. This district may include specifically designated recharge areas that collect precipitation or surface water and carry it to aquifers.

"Hazardous Material": A material which is defined in one or more of the following categories:

"Ignitable": A gas, liquid or solid which may cause fires through friction, absorption of moisture, or which has low flash points. Examples: white phosphorous and gasoline.

"Carcinogenic": A gas, liquid, or solid which is normally considered to be cancer causing or mutagenic. Examples: PCB's in some waste oils.

"Explosive": A reactive gas, liquid or solid which will vigorously and energetically react uncontrollably if exposed to heat, shock, pressure or combinations thereof. Examples: dynamite, organic peroxides and ammonium nitrate.

"Highly Toxic": A gas, liquid, or solid so dangerous to man as to afford an unusual hazard to life. Example: chlorine gas.

"Moderately Toxic": A gas, liquid or solid, which through repeated exposure or in a single large dose can be hazardous to man.

"Corrosive": Any material, whether acid or alkaline, which will cause severe damage to human tissue, or in case of leakage might damage or destroy other containers of hazardous materials and cause the release of their contents. Examples: Battery acid and phosphoric acid.

"Primary Containment Facility": A tank, pit, container, pipe or vessel of first containment of a liquid or chemical.

"Release": Any unplanned or improper discharge, leak or spill of a potential contaminant including a hazardous material.

"Secondary Containment Facility": A second tank, catchment pit, pipe or vessel that limits and contains liquid or chemical leaking or leaching from a primary containment area; monitoring and recovery are required.

"Shallow/Surficial Aquifer": An aquifer in which the permeable medial (sand and gravel) starts at the land surface or immediately below the soil profile.

"Spill Response Plans": Detailed plans for control, containment, recovery, and clean up of hazardous material releases, such as during fires or equipment failures.

"Storm water Treatment Practices" (STPs): Measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or non-point source pollution inputs to storm water runoff and water bodies.

"Time-of-Travel Distance": The distance that groundwater will travel in a specified time. This distance is generally a function of the permeability and slope of the aquifer.

13.12.030 **Zones within the Ground Water Protection Area**. A. Drinking Water Critical Impact Zone 1 and Drinking Water Critical Impact Zone 2. Zones 1 and 2 are defined as the area within the 2-year time-of-travel distance mapped around the public water supply well(s).

(1) Encouraged Uses. The following uses are encouraged within Zones 1, 2 provided they meet the appropriate performance standards outlined in 3.2(c) below and are designed so as to prevent any ground water contamination.

(a) Parks, greenways, or publicly owned recreational areas such as foot bicycle and/or horse paths, and bridges.

(b) Necessary public utilities/facilities including the construction, maintenance, repair, and enlargement of drinking water supply related facilities such as, but not limited to, wells, pipelines, aqueducts, and tunnels.

(c) Conservation efforts for soil, water, plants, and wildlife.

(2) Special Exceptions. The following uses are permitted only under the terms of a special exception and must conform to provisions of the underlying zoning district and meet the performance standards outlined in 13.12.040 below.

(a) Expansion of existing nonconforming uses to the extent allowed by the underlying district. The applicant should consult the local zoning plan to confirm nonconforming uses. The City of Cave Junction reserves the right to review all applications and shall not grant approval unless it finds such expansion does not pose greater potential contamination of ground water than the existing use.

(3) Prohibited Uses. The following uses, unless granted a special exception, are prohibited within Zones 1, 2 the 2 year time-of-travel zone.

(a) Automobile body/repair shop.

(b) Gas stations.
(c) Fleet/trucking/bus terminals.
(d) Dry cleaner.
(e) Electrical/electronic manufacturing facility.
(f) Machine shop.
(g) Metal plating/finishing/fabricating/facility.
(h) Chemical processing/storage facility.
(i) Wood preserving/treating facility.
(j) Junk/scrap/salvage yard.
(k) Mines/gravel pit
(l) Irrigated nursery/greenhouse stock.
(m) Confined animal feeding operations.
(n) Land divisions resulting in high density (>1 unit/acre) no septic systems.
(o) Equipment maintenance/fueling areas.
(p) Injection wells/dry wells/sumps, except for single-family residences directing gutter downspouts to a drywell.
(q) Underground storage tanks, (except those with spill, overfill, and corrosion protection requirements in place).
(r) All other facilities involving the collection, handling, manufacture, use, storage, transfer, or disposal of any solid or liquid material or waste having potentially harmful impact on groundwater quality.
(s) All uses not permitted in the underlying zone district.

B. Drinking Water Potential Impact Zone 3 and Drinking Water Potential Impact Zone 4. Zones 3 and 4 are established, as the remainder of the Ground Water Protection Area not included in Zones 1 and 2, but deemed necessary to ensure adequate protection of public drinking water supplies.

(1) Permitted Uses. All uses permitted in the underlying zoning districts provided they can meet the Performance Standards as outlined for the Ground Water Protection Area.

(2) Special Exceptions. All special exceptions allowed in underlying districts may be approved by the City of Cave Junction provided they can meet performance standards outlined for the Ground Water Protection Area

13.12.040 Performance Standards. A. The following standards shall apply to uses in the Ground Water Protection Area.

(1) Any facility involving the collection, handling, manufacture, use, storage, transfer or disposal of any solid or liquid material or wastes, unless granted a special exception either through permit or another ordinance, must have a secondary containment system which is easily inspected and whose purpose is to intercept any leak or release from the primary containment vessel or structure. Underground tanks or buried pipes carrying such materials must have double walls and inspectable sumps.

(2) Open liquid waste ponds containing materials referred to in item (1) above will not be permitted without a secondary containment system.

(3) Storage of petroleum products in quantities exceeding (275) gallons at one locality in one tank or series of tanks must be in elevated tanks; such tanks must have a secondary containment system noted in item (1) above where it is deemed necessary by the City of Cave Junction.

(4) All permitted facilities must adhere to appropriate federal and state standards for storage, handling and disposal of any hazardous waste materials.

B. An acceptable contingency plan for all permitted facilities must be prepared for preventing hazardous materials from contaminating the shallow/surficial aquifer should floods, fire, or other natural catastrophes, equipment failure, or releases occur.

(1) For flood control, all underground facilities shall include but not be limited to a monitoring system and secondary standpipe above the 100 year flood control level, for monitoring and recovery. For above ground facilities, and impervious dike, above the 100 year flood level and capable of containing 100 percent of the largest volume of storage, will be provided with an overflow recovery catchment area (sump).

(2) For fire control, plans shall include but not be limited to a safe fire fighting procedure, a fire retarding system, effective containment of any liquid runoff, and provide for dealing safely with any other health and technical hazards that may be encountered by disaster control personnel in combating fire. Hazards to be considered are pipes, liquids, chemicals, or open flames in the immediate vicinity.

(3) For equipment failures, plans shall include but no be limited to the following:

(a) Below ground level, removal and replacement of leaking parts, a leak detection system with monitoring, and an overfill protection system.

(b) Above ground level, liquid and leaching monitoring of primary containment systems, the replacement or repair and cleanup and/or repair of the impervious surface.

(c) For any other release occurring, the owner and/or operator shall report all incidents involving liquid or chemical material to the Ground Water Protection Coordinator designated by the City of Cave Junction.

(4) Since it is known that improperly abandoned wells can become a direct conduit for contamination of ground water by surface water, all abandoned wells should be properly plugged according to local and state regulations.

13.12.050. **Liability**. Nothing in this ordinance shall be construed to imply that the City of Cave Junction has accepted any of an owner/developer's liability if a permitted facility or use contaminates ground water in any aquifer.

13.12.060 **Area Boundary Disputes**. If the location of the Ground Water Protection Area boundary in relation to a particular parcel is in doubt, resolution of boundary disputes shall be through a Special Permit Application. The burden of proof shall be upon the owner(s) of the land to demonstrate where the boundaries of the district with respect to their individual parcel(s) of land show should be located. If the owner(s) request that the local government agency determine more accurately the boundaries of the district with respect to individual parcels of land, the agency may engage a professional engineer, hydrologist, geologist, or soil scientist and charge the owner(s) for the cost of the investigation.

13.12.070 **Enforcement**.

A. Civil Enforcement.

(1) Any person may submit a verbal or written complaint alleging a violation of this ordinance.

(2) Upon receipt of a complaint, the jurisdiction shall conduct a brief investigation of the substances of the complaint, including a meeting with the landowner involved.

(3) Based upon the determination that there is a violation of this ordinance, the jurisdiction shall conduct an informal reconciliation with the violator. As part of such informal reconciliation, the jurisdiction shall:

(a) Notify the violator by mail of the violation of this ordinance and a desire of the jurisdiction to correct the violation through informal reconciliation. The statement shall also indicate that should the violator refuse to allow the recommended corrective actions within the time set forth by the jurisdiction, action may be taken to correct the violation and the violator will be billed for the cost of taking the corrective action.

(b) Make a good faith effort to meet the violator and resolve/correct the violation.

(4) If after taking the steps above and after a period of (15) days following the mailing of the notice of the violation, the jurisdiction in good faith determines that the violator is unwilling to participate in informal reconciliation and take the corrective actions prescribed, the jurisdiction shall notify the violator by mail of the termination of the informal reconciliation.

(5) The jurisdiction may take corrective actions deemed necessary following (15) days after notifying violator by mail of the notice of termination of the informal reconciliation, and bill the violator for the reasonable cost of such action.

B. Criminal Enforcement: In lieu of civil enforcement proceeding, a person who is alleged to have violated this ordinance, a person may be charged with the commission of a crime.

C. Violation of this ordinance is a misdemeanor and may be punished by imprisonment of not more than (60) days or imposition of a fine of not more than $5000.00 or both.

Chapter 13.16

Surface Water Protection

Sections:

13.16.010 Statement of Intent and Applicability. A. The Water Protection Area regulations are intended to ensure the adequate protection of current or potential public water supply to those in the protection area. The establishment of these regulations is intended to protect public health, insure the availability of safe drinking water, and prevent the degradation of the water supply in the water shed through the regulation of land uses and development within the water shed drainage area.
B. The special provisions established in this section shall apply to proposed projects identified as possible contaminating activities within areas designated as the Water Protection Area. These areas may be identified through drainage, ground water and soils analyses and are considered to be essential to protection of existing or potential public water supplies from the effects of point and non-point source pollution or sedimentation.
C. The boundaries of the Water Protection Area shall be delineated using the most current and best available location data and must be shown on all master zoning map(s) kept on file. The boundaries should be sufficient size to guarantee the existing projects that can contribute to the contamination of public water supplies. These zones may be modified as necessary by the City of Cave Junction as new assessment data becomes available.

13.16.020 Definitions. For the purposes of this section, the following terms shall have the following meanings:

"Development". Any construction, external repair, land disturbing activity, grading, road building, pipe laying, or other activity resulting in a change in the physical character of any parcel or land.

"Potential Contaminating Activity". Activities identified as having the potential to discharge contaminants to surface or ground waters.

"Water Protection Area". The area of surface waters designed to provide drinking water to the public.

"Tributary Stream". Any perennial or intermittent stream, including any lake, pond or other body of water formed therefrom, flowing either directly or indirectly into any main body or stream in the Water Protection Area.

"Watershed". Any area lying within the drainage basin of the Water Protection area.

CR5 452 Exhibit B

13.16.030 Use Regulations. A. Within the Water Protection Area, the permitted uses, special permit uses, accessory uses, dimensional standards and special requirements established by the underlying zoning district shall apply, unless specifically modified by the requirements of this ordinance.

B. The following uses shall be specifically prohibited within the Water Protection Area:

(1) Storage or production of hazardous materials as defined in either or both of the following:

(a.) Superfund Amendment and Reauthorization Act of 1986; and

(b) Identification and Listing of Hazardous Wastes, 40 C.F.R. §261 (1987)

(2) Disposal of hazardous materials or solid wastes.

(3) Treatment of hazardous material, except rehabilitation programs authorized by a government agency to treat hazardous material present at a site prior to the adoption of this ordinance.

(4) Dry-cleaning, dyeing, printing, photo processing and any other business that stores, uses or disposes of hazardous material, unless all facilities and equipment are designed and operated to prevent the release or discharge of hazardous materials and have undergone an inspection to certify they are in compliance within hazardous material regulations.

(5) Disposal of septage or septic sludge.

(6) Automobile service stations

(7) Junkyards

(8) Other uses as specified by the City of Cave Junction as potential contaminating activities.

13.16.040 Review requirements for Development in the Water Protection Area.

A. A copy of any new application for a building permit, zoning permit, are variance, use variance, zoning amendment, or other land development proposal, including the subdivision of land, occurring wholly or partly in a Water Protection Area shall be submitted to the City of Cave Junction and shall be accompanied by an impact study prepared in accordance with the requirements set forth in Section 13.16.050 below.

B. Applications for development within the Water Protection Area will be evaluated by the City of Cave Junction to ensure that:

(1) Non-point source pollution is prevented to the maximum extent possible, by taking into account site conditions such as slope, soil type and erosivity, and vegetative cover.

(2) Management practices are in place sufficient to remove or neutralize those pollutants that present a potential impact to the Water Protection Area.

(3) Grading and removal of vegetation at a development site is minimized and erosion and sediment control measures are in place and properly installed.

(4) All sewage disposal systems will be monitored, inspected and maintained on a regular basis to ensure proper functioning. If two or more dwelling units share a common sewage treatment system, a perpetual maintenance agreement shall be required by the City of Cave Junction.

(5) Businesses involved in potential contaminating activities within the Water Protection Area but which have received a special use permit must submit a spill control plan for approval. This plan shall include the following elements:

(a) Disclosure statements describing the types, quantities, and storage locations of all contaminants that will be part of the proposed project.

(b) Contaminant handling and spill prevention techniques.

(c) Spill reporting procedures, including a list of affected agencies to be contacted in the event of a spill.

(d) Spill recovery plans, including a list of available equipment.

(e) Spill clean up and disposal plans.

C. Existing land uses located within the Water Protection Area and identified as potential contaminating activities by the City of Cave Junction shall comply with the requirements of Section B, Subsection (4(e)) listed above.

13.16.050 **Impact Study.** A. An impact study shall be performed or reviewed by a registered professional engineer and shall include, at a minimum, the following information.

(1) Description of the proposed project including location and extent of impervious surfaces: on-site processes or storage of materials; the anticipated use of the land and buildings; description of the site including topographic, hydrologic, and vegetative features.

(2) Characteristics of natural runoff on the site and projected runoff with the proposed project, including its rate and chemical characteristics deemed necessary to make an adequate assessment of water quality.

(3) Measures proposed to be employed to reduce the rate of runoff and pollutant loading of runoff from the project area, both during construction and after.

(4) Proposed runoff control and water quality protection measures for the site. These measures shall be designed with the goal of ensuring that the rate of surface water runoff from the site does not exceed pre-development conditions and the quality of such runoff will not be less than pre-development conditions. Special emphasis shall be placed on the impacts of proposed encroachments into the required buffer.

(5) Where the developer of property subject to the terms of this protection area seeks to utilize existing or planned off-site storm water quality management facilities, the developer shall provide a written certification that the owner of the off-site facilities will accept the runoff and be responsible for its adequate treatment to a level acceptable to the City of Cave Junction.

B. Such study shall be submitted to the City of Cave Junction for review and approval concurrent with the submission of applications for review and approval of site or subdivision plans or applications for land disturbing or erosion and sediment control permits. A copy of the impact study shall also be forwarded to those agencies identified as interested parties, which are responsible for managing the Water Protection Areas watershed for review and comments.

13.16.060 **Buffer Requirements.** A. Stream and shore buffer widths vary from twenty feet (20') to up to two hundred feet (200') in ordinances throughout the United States. Since this ordinance is for the Water Protection Area that supplies public drinking water, the large buffer width of two hundred feet (200') shall apply.

B. A two hundred foot (200') wide buffer strip shall be maintained along the edge of all public water supply rivers and any tributary stream discharging into these rivers in the Water Protection Area. The required setback distance shall be measured from the centerline of such tributary stream and from the high water level of any river in the Water Protection Area. The buffer strip shall be maintained in its natural state to the maximum extent possible, and shall be planted with an erosion resistant vegetative cover in those areas that have been disturbed. In the case of tributary streams located upstream from a storm water management facility designed to provide water quality protection, no buffer shall be required if such facility has been designed to accommodate and manage the quality of runoff from the subject site.

C. A reduction in the required buffer width down to an absolute minimum of seventy five feet (75') may be granted by the City of Cave Junction upon presentation of an impact study that provides sufficient documentation and justification that even with the reduction, the same or a greater degree

of water quality protection would be afforded as would be with the full-width buffer. In granting such a reduction, the City of Cave Junction may require additional erosion control or runoff control measures as deemed necessary to protect the water quality in the Water Protection Area.

D. All development shall be located outside of the required buffer strip, except for the following:

(1) The buffer strip requirement shall not apply to development, which is appurtenant to the production, supply, distribution or storage of water by a public water supplier.

(2) Encroachment into or through the required buffer by toads, main-line utilities, or storm water management structures may be permitted provided the following performance standards are met:

(a) Road and main-line utility crossings will be limited to the shortest path possible and that which causes the least amount of land disturbance and alteration to the hydrology of the watershed.

(b) Any storm water management facilities located within the buffer should be sited within the context of a larger watershed storm water management program.

(c) No more land shall be disturbed than is necessary.

(d) Indigenous vegetation shall be preserved to the maximum extent possible.

(e) Wherever possible, disturbed areas shall be planted with trees and shrubs.

(3) When the property where and encroachment is proposed is owned by the entity owning and operating the Water Protection Area, and such entity specifically and in writing authorizes and approves the encroachment, it shall be allowed.

E. The following uses shall not be permitted within the buffer strip or within the buffer strip or within fifty feet (50') of the required buffer strip.

(1) Septic tanks and drainfields.

(2) Feed lots or other livestock impoundments.

(3) Trash containers and dumpsters which are not under roof or which are located so that leachate from the receptacle could escape unfiltered and untreated.

(4) Fuel storage in excess of fifty (50) gallons

(5) Sanitary landfills.

(6) Activities involving the manufacture, bulk storage or any type of distribution of petroleum, chemical or asphalt products or any materials hazardous to a water supply (as defined in the Hazardous Materials Spills Emergency Handbook, American Waterworks Association, 1975, as revised) including specifically the following general classes of materials:

(a) Oil and Oil products.

(b) Radioactive materials.

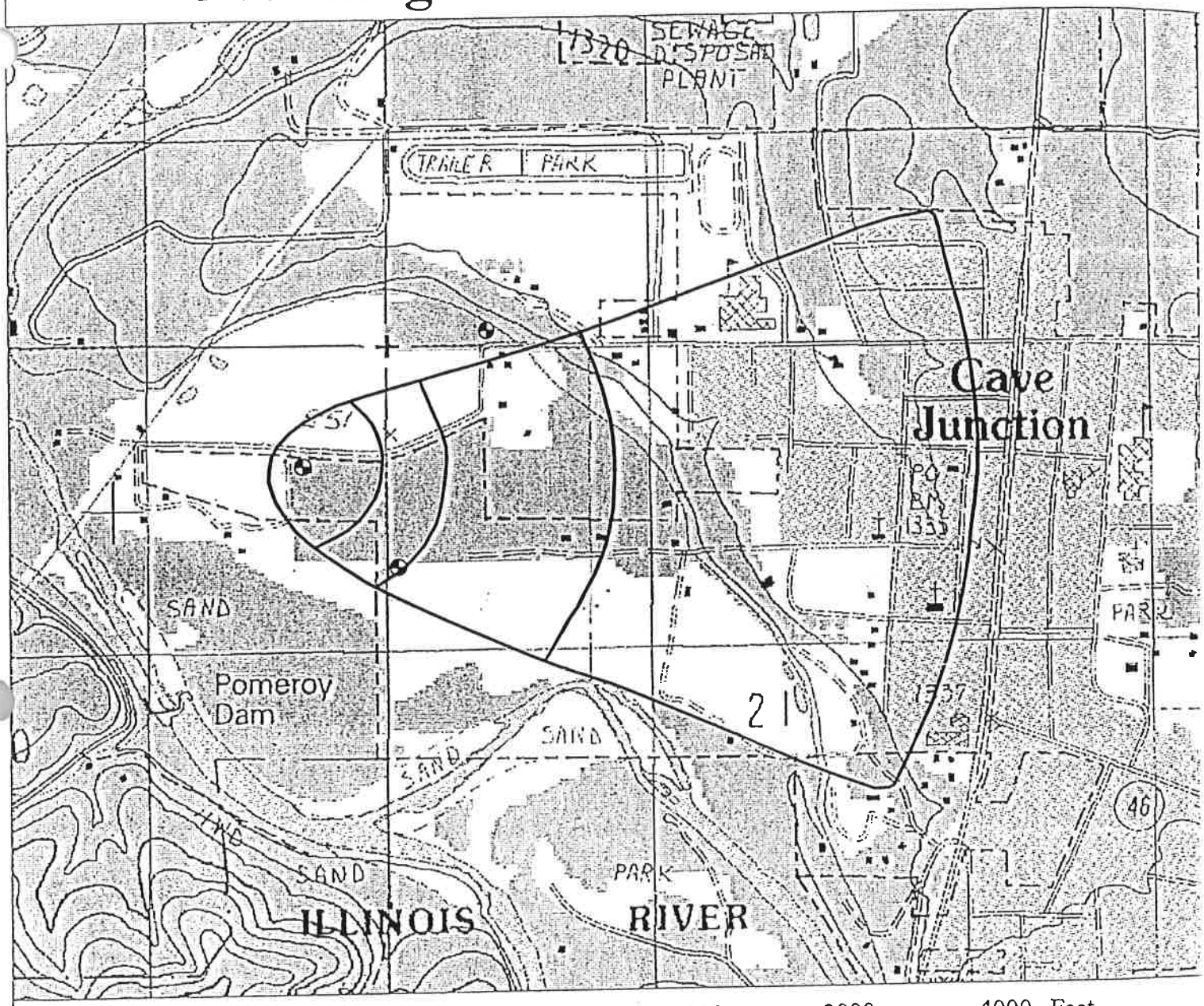
(c) Any material transported in large commercial quantities that are a very soluble acid or base, highly biodegradable, or can crate a severe oxygen demand.

(d) Biologically accumulative poisons.

(e) The active ingredients of poisons that are or were ever registered in accordance with the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, as amend (7 USC 135 et seq.)

(f) Substances highly lethal to mammalian or aquatic life.

Figure 1. City of Cave Junction Drinking Water Protection Area



Scale 1: 12,000

Drinking Water Protection Area (DWPA)
1, 2, 5, and 10 Year Time of Travel (TOT)
Analytic Element Method

Well Location (WGS84 Datum): Josephine Cou
T. 39 S., R. 8 W., Sec. 2
Lat. 42° 10' 01.9381"N,
Long. 123° 39' 47.4169'

Model Parameters
Production Interval (ft): 125
Effective Porosity: 0.20
Usage (gal/day): 168,787

QUADRANGLE LOCATION

Prepared by: TP
Project Manager: TP RG# G-1874
PWS#: 4100971 File#: CAV100

USGS Cave Junction, OR Quadrangle (part section) 7.5' Series (Topograp

A-F1

FROM THE STATE GEOLOGIST, DR. VICKI S. McCONNELL
Geology and hazard response plans

Although the awakening of Mount St. Helens is not the only geologic activity that has occurred in or near our state in the last year, it certainly created the biggest stir. Why is that? Volcanoes certainly garner a certain amount of curiosity and infamy in general; that attention increases during an eruption. Other events like minor earthquakes or the opening or closing of quarries are not considered front page news.

A more pragmatic reason for the notice associated with Mount St. Helens is the immediate impact of policy decisions made to address the increase in risk – closing of visitor centers and restricting access to areas and roads. If you want the public to notice something, just tell them they can't go there!

The policy decisions made in response to the increased risk of a volcanic eruption from Mount St. Helens were not arbitrary. They resulted from following a decision tree outlined in a coordinated hazard response plan for Mount St. Helens. Response plans for geologic hazards are the logical outcome of a basic part of DOGAMI's mission – to identify and characterize the geology of the state of Oregon.

To me, the development of geologic hazards response plans represents an excellent measure of the success of both our geologic work and our public education programs at DOGAMI. Writing a response plan is done when you have learned of a hazard or threat and you determine there is enough information available to make adequate decisions.

The challenge in preparing any response plan is ensuring that proper organizations are involved in the creation of the plan and that everyone has the necessary information to aid with decision making.

Here in Oregon we have our fair share of geologic hazards to plan for, including our own volcanoes. For example, DOGAMI staff serves as the state geology representative to review and revise the Mount Hood Coordination Plan that is slated to be released early in 2005. If you would like to preview the plan, you may do so from our website, oregongeology.com, and click on the "Earthquakes and other natural hazards" page.

A more challenging volcano response plan involves the threat to the communities and resources in the Central Cascades. From Mount Jefferson to Newberry Volcano there are several volcanoes and volcanic centers, with a wide scale of potentially hazardous types of eruptions and erupted materials. The hazard could impact communities on both sides of the Cascades.

We do much more than volcano response plans. We are assisting coastal communities with their planning for response to tsunami hazards. We research and map the extent of past tsunamis and model where we would expect inundation from a future tsunami. Then we help communities map evacuation routes and develop brochures to explain them to coastal residents and visitors.

Landslides, particularly fast-moving debris flows, are a common winter hazard, and call for a different type of response plan. After several fatalities in 1996-98, a debris flow warning system has been put in place, involving the Oregon Department of Forestry, Oregon Emergency Management, and the National Weather Service. Rainfall is monitored, and when pre-established thresholds are reached, a debris-flow warning may be issued. Part of the response plan includes highway signs notifying travellers entering potentially dangerous areas.

These are only a few of the various types of response plans that DOGAMI has been involved with. Communities, businesses, government agencies, and individuals can all benefit from planning their responses to the many geologic hazards in Oregon.

Our work to expand and refine information about Oregon's geology continues, as does our coordination with other agencies and organizations. Response plans must be updated periodically to reflect current understanding. The more we know about the potential damage from specific geologic hazards, the more we can all use our limited resources more wisely.

Appendix C: Emergency Response Plan-(ERP)

THE FOLLOWING CHART OUTLINES THE PWS NOTIFICATION OF PERSONNEL AND THEIR RESPONSIBILITIES:

SPILL INSIDE THE DRINKING WATER PROTECTION AREA:
Found By Consumer:

CONSUMER / CITIZEN

POLICE DEPARTMENT
( ) _____

FIRE DEPARTMENT
( ) _____

WATER COMPANY
PRINCIPAL WATER OPERATOR
( ) _____

LOCAL NEWS MEDIA
( ) _____

HAZARDOUS MATERIALS TEAM
( ) _____

COUNTY PUBLIC HEALTH DEPARTMENT
( ) _____

COUNTY EMERGENCY MANAGEMENT DIRECTOR
Al Rhodes, Coordinator
Courthouse, 500 N.W. 6th
Grants Pass, OR 97526
Office Phone: (541) 474-5300
Fax Number: (541) 474-5150

STATE AGENCIES
( ) _____

RESOLUTION NO. 598

A RESOLUTION ADOPTING A DROUGHT ACTION PLAN.

WHEREAS, the City provides water to the citizens through the Public Works Department; and

WHEREAS, the spring of this calendar year has been extremely dry; and

WHEREAS the City of Cave Junction finds that to ensure water availability to the citizens, it is in the best interest of the City and its citizens to adopt a drought action plan.

NOW THEREFORE, BE IT RESOLVED the Common Council of the City of Cave Junction does hereby approve and adopt the attached Drought Action Plan dated June 11, 2001.

PASSED by the Common Council of the City of Cave Junction this 25th day of June, 2001.

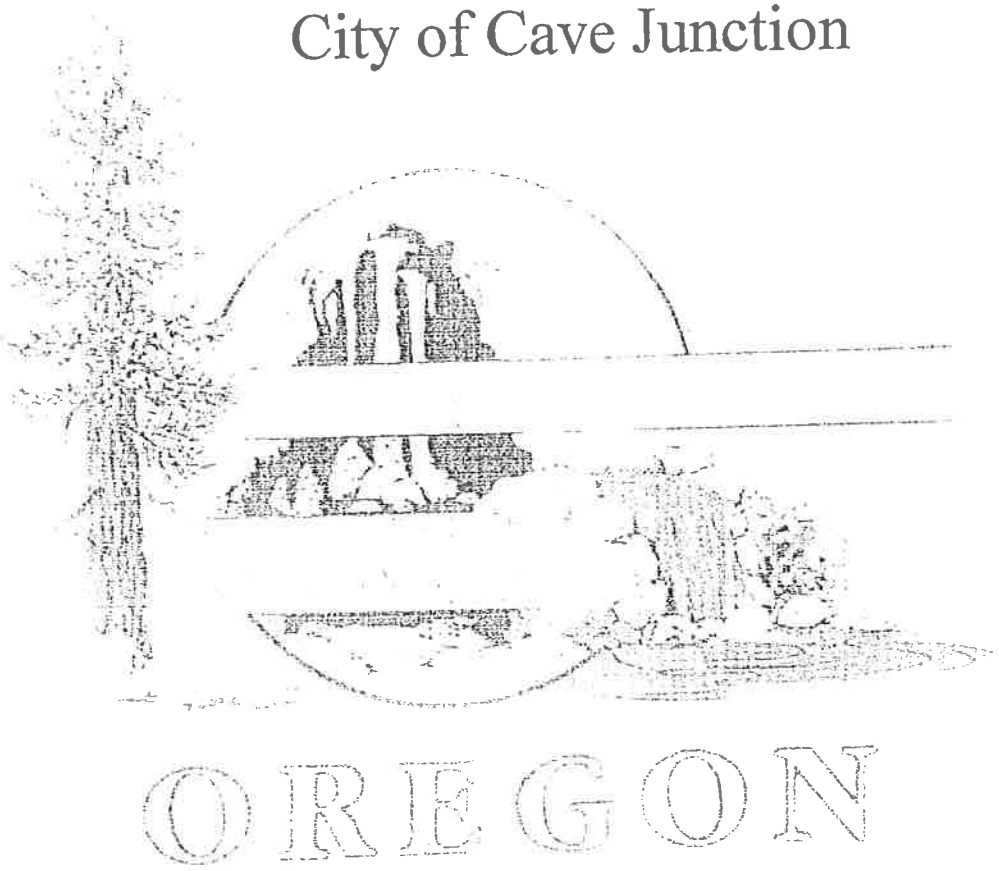
SUBMITTED TO AND APPROVED by the Mayor of the City of Cave Junction on this 26th day of June, 2001.

Signed: _____
ED FAIRCLOTH, Mayor

Attest: _____
CHARLES J. POLK, Recorder

DROUGHT ACTION PLAN

City of Cave Junction



Approved by: City Council

Ed Faircloth, Mayor
Dan Fiske
Doug Blair
Rita Dyer
Sandi Lund

June 11, 2001

INDEX

Section Page

Attachments

1. PURPOSE

This Action Plan is being developed to assess the ongoing water production, supply and distribution capability in the community and to outline a strategy for implementation of steps to ensure optimum system operation.

The objectives of the plan are to allow citizens and city officials to establish a prioritized list of stages and action levels to meet needs of the citizens, businesses and the City.

2. WATER SYSTEM DESCRIPTION

Storage Capacity (Reservoirs)

#1 - S. Old Stage Road	380,000 gallons
Current out of service for repairs	
#2 - S. Old Stage Road	60,000 gallons
Abandoned and targeted for demolition.	
This would be the site for future construction/expansion.	
#3 - Laurel Road	500,000 gallons
#4 - Laurel Road	1,500,000 gallons

Water Sources

Treatment Plant	3 CFS	(2,000,000 gallons per day)
Surface water from the E. Fork of the Illinois River.		
Rockydale Wells	1 CFS	(650,000 gallons per day)
#1 - Removed from service.		
#2 - Abandoned.		
#3 - Removed from service.		
Daisy Hill Wells	0.6 CFS	(390,000 gallons per day)
#4 - Daisy Hill - In service.		
#5 - Berard - Out of service.		
#6 - Meyers - Abandoned.		

3. CALENDAR YEAR STATUS (2001)

Treatment Plant

The surface water treatment plant is the City's primary source of water. Currently, production at the plant is limited to 1,000 gallons per minute. This limitation is due to the failure of one of the pumps at the river intake. The pump is being repaired and should be back in service in the near future.

For the treatment plant to produce the full permitted water right of 2,000,000 gallons per day, the plant would need to operate the full 24 hours. This would require an operator to be on-site all of the time.

Wells

The Rockydale wells are out of service. Well #2 has been abandoned. Wells #1 and #3 are out of service due to low yields and water quality problems.

The Daisy Hill wells are producing less water. The Meyers well (#6) was abandoned due to low yield and poor water quality. The Berard well (#5) is currently out of service due to low yield. The Daisy Hill well (#4) is in service but has been showing a declining yield.

Storage Capacity

Reservoir #1 is currently out of service for repairs. The reservoir was cleaned and inspected. The reservoir will be placed back in service after new ladders are installed and cracks in the interior cement lining are sealed.

Reservoirs #3 and #4 are in service providing a total of 2,000,000 gallons of storage capacity.

Impacts and Issues affecting the System

The City should maintain a three (3) day water supply in the reservoirs.

Fire protection is a critical aspect to the overall storage and production issue. With Reservoir #1 being out of service, the fire flow integrity for the southeast section of the City is affected. The City Public Works Department has established an operational policy to maintain the treatment plant clear well (500,000 gallons) at a high elevation to aid and provide additional water in the event of a fire.

Water Resources predict that there should be water in the Illinois River to meet the community needs. The quality of the water may be of some question. Water Resources

are very concerned that the water will be scarce in the mid to later part of the summer. As of the date of this document, the river level is approximately 1/8 of the normal flow.

The issue of costs associated with water production may need to be addressed. As water availability is reduced, the run-times at the water plant increase. The cost to produce a gallon of water may go up dramatically.

4. DROUGHT STAGES AND ACTION LEVELS

Definitions:

High Usage Customer: Customer that consumes a minimum fo 5,000 cubic feet (37,400 gallons) of water per month.

Public: Customers of the City's water system.

SDC Operations: The public works department employees assigned duties for the operation of the water system distribution, wastewater collection street maintenance and parks maintenance.

Procedures:

SDC Operations, responsible for the City's water distribution system, shall be responsible for identifying high usage customers.

SDC Operations shall be responsible for monitoring water service meters to determine compliance with conservation requirements and city regulations.

STAGE 1 (Voluntary Response)

The following are the bench marks (action levels) for this stage. Any two of these conditions may initiate this stage.

1. River in-take falls below 6 feet during normal water production at the water plant.
2. Water demand averages more than 350,000 gallons per day during any week period.
3. Water plant production run-time to meet water demand exceeds normal scheduled work week production time. (Plant runs more than 8 hours/day, 5 days/week, to meed the demand.)
4. Storage recovery falls below 5 days.
5. Operations problems occur that disrupt water production and/or storage.

The following are the actions to be implemented for this stage.

1. Notify the public of existing drought conditions.
    A. Public Notice in local newspaper
    B. Public Service Announcements on local televison and radio stations.
    C. State of Oregon Water Resources Assistance Program.
2. Request the public voluntarily conserve water.
3. Provide water conservation pamphlets to the public (mail and over-the-counter).

STAGE 2 (Serious, Regulated Conservation)

The following are the bench marks (action levels) for this stage. Any two of these conditions may initiate this stage.

1. River in-take falls below 4 feet during normal water production at the water plant.
2. Water demand averages more than 350,000 gallons per day during any week period.
3. Water plant production run-time to meet water demand exceeds 70 hours per week. (Plant runs in excess of10 hours/day, 7 days/week, to meed the demand.)
4. Storage recovery falls to 3 days or less.
5. Operations problems occur that disrupt water production and/or storage.

The following are the actions to be implemented for this stage.

1. Even/Odd days for outside watering.
2. Eliminate drafting from fire hydrants
3. Restrict commercial car washing.
4. Próhibit water use for fund raising events.
5. Restrict water use with notification to high usage consumers. Inform public of regulations that authorize enforcement of water restrictions (attachment 1).

STAGE 3 (Critical)

The following are the bench marks (action levels) for this stage. Any one of these conditions may initiate this stage.

1. River in-take falls below sustainable yield.
2. Water demand averages more than 450,000 gallons per day during any week period.
3. Water plant production run-time to meet water demand exceeds 70 hours per week. (Plant runs more than 10 hours/day, 7 days/week, to meed the demand.)
4. City can not maintain storage recovery.
5. Operations or mechanical problems occur that limits water production and/or storage.

The following are the actions to be implemented for this stage.

1. Declaration of Emergency.
2. Water limited to essential use only.
    A. Drinking.
    B. Sanitation.
    C. Fire Protection.
3. All outside water prohibited.
4. City requests assistance/aid from Josephine County and State of Oregon.

5. ENFORCEMENT

Any violation of the requirements of Stage 2 or Stage 3 of this plan may be enforced by the City in accordance with Municipal Code 13.02.140, paragraphs C through H.

1. The City shall deliver a WARNING NOTICE by mail or in person to any service customer that is in violation of these requirements.
2. The City shall provide notice five (5) days prior to termination of service for non-compliance.
3. A service fee shall be charged for reinstatement of service.

The City of Cave Junction
Emergency Preparedness Procedures and Work Rules

1.0 PURPOSE

To set City procedures for Preparedness and Response to Emergencies.

2.0 GENERAL POLICY

2.1 To provide an Emergency Preparedness and response Action Plan for Emergency Levels 1,2, and 3 as set forth in this policy.

2.2 Glossaries of Acronyms

2.2.1 DO: Duty Operator's (On -Call operators to address issues regarding the parks, streets, water treatment, water distribution, waste water treatment, and waste water collections systems.

2.2.2 EAO: Emergency Actions Officer

2.2.3 DS: Department Supervisor

2.2.4 MYR: Mayor

2.2.5 PIO: Public Information Officer

2.2.6 SO: Safety Officer

2.2.7 PO: Plant Operations Division (Responsible for the operations of the water and waste water treatment plants).

2.2.8 MO: Maintenance Operations Division (Responsible for the parks, streets, water distribution system, and waste water collections system).

3.0 REGULAR BUSINESS HOURS

The City of Cave Junction will be open Monday through Friday, 8:00 a.m. to 12:00 (Noon), and 1:00 p.m. to 5:00 p.m. Monday through Friday. City Hall can be reached at 592-2156. The Plant Operations Department may be reached by calling 592-4590 or 592-3254 Cell Phone 287-0044 Maintenance Operations may be reached by calling 592-3480 Cell Phone 287-0043.

4.0 AFTER HOURS ROAD HAZARDS AND EMERGENCIES

Based on the incident, the Duty Operator will be called and will respond to all call-outs.

Maintenance Operations (Streets, Collections, and Distribution): 592-3480
Cell Phone 287-0043

Plant Operations (Water/Waste Water treatment): 592-4590 ,592-3254
Cell Phone 287-0044

For Emergencies after regular business hours, the citizens of Cave Junction may also contact the Josephine County Sheriff's Office or use 9-1-1 system.

5.0 POLICY AND WORK RULE/PROCEDURES

TASK	RESPONSIBLE PARTY
Be prepared	
5.1.1 Preventive Maintenance	
5.1.1.1 Inspect and clean all culverts, ditches, and storm drains.	MO
5.1.1.2 Inspect and maintain water treatment facility as scheduled.	PO
5.1.1.3 Inspect and maintain waste water treatment facilities as scheduled.	PO
5.1.1.4 Inspect and maintain collection system as scheduled.	MO
5.1.2 Inventory stock pile for materials	
5.1.2.1 Waste water treatment plant yard	MO
5.1.2.2 Water treatment plant yard	PO
5.1.2.3 City Hall Garage	MO
5.1.2.4 Distribution/Collection Yard	MO

5.1.3 Training for field response

5.1.3.1 Emergencies — EAO

5.1.3.2 Departments — DS

5.1.4 Mapping System

5.1.4.1 Distribution system — MO

5.1.4.2 Collection system — MO

5.1.4.3 Streets — MO

5.1.4.4 Water Treatment — PO

5.1.4.5 Waste Water System — PO

5.1.5 Emergency Coordination Center — EAO

5.1.6 Maintain Emergency Response Equipment

5.1.6.1 Streets, Distribution, Collections System — MO

5.1.6.2 Water/Waste Water Treatment Plants — PO

5.1.6.3 Safety — SO

5.2 Maintenance and inventory of signs and expendables.

5.2.1 (See attached Inventory List)

5.3 Provide capital equipment

5.3.1 Maintain all equipment in a constant state of Readiness.

5.3.1.1 All City trucks — MO

5.3.1.2 Backhoe — MO

5.3.1.3 Plant generator's — PO

5.3.1 Continued

5.3.1.4 Portable Pumps	MO
5.3.1.5 Radios	MO
5.3.1.6 All Barricades	MO
5.3.1.7 Sewer Cleaner	MO

5.3.2 Purchase/Obtain Additional Equipment

5.3.2.1 As events dictate	DS/EAO

5.4 Provide Response and Post-Response Evaluation

5.4.1 Priorities

5.4.1.1 Preservation of life, health, and safety of the citizens of Cave Junction	All
5.4.1.2 Preservation of essential services	All
5.4.1.3 Manage hazards	All
5.4.1.4 Preservation of economic base	All
5.4.1.5 Protection of public buildings, schools commercial buildings, and residences	All

5.4.2 Written Reports

5.4.2.1 Provide a written report to the department supervisor noting all problem areas	All
5.4.2.2 Departments to provide proposed solutions based on scope and complexity of issues	All
5.4.2.3 Duty Operator assessment report to department supervisors	All
5.4.2.4 Develop a data base of problem areas.	DS

5.4.2 Written Reports Continued

5.4.2.5 Conduct a post-response evaluation with department supervisors and administration — Myr

5.5 Communications

5.5.1 Coordination during response

5.5.1.1 A duty operator, when called out, responds to emergencies and makes evaluation — DO

5.5.1.2 Duty operator contacts department supervisor, reports findings — DO

5.5.1.3 Department supervisor coordinates response, depending on level of the emergency, may contact Mayor — DS

5.5.1.4 Mayor may coordinate and supervise response from home, office, or field, depending on level of the emergency — Myr

5.5.2 Intra/Inter-Agency

5.5.2.1 Develop intra/inter-agency cooperation agreements — EAO

5.5.2.2 Provide complete a call list of agencies and contact Personnel with emergency phone numbers — EAO

5.5.2.3 Use proper radio communication procedures to Communicate with all agencies. — All

5.5.2.4 Coordinate communications with ECC and Josephine County EOC — EAO

5.5.3 Radio Communications

5.5.3.1 Maintain communications with base — All

5.5.3.2 Keep all calls as short as possible — All

5.5.3	**Radio Communications Continued**	
	5.5.3.3 Do not interrupt calls in progress	All
	5.5.3.4 Use proper radio communication procedures and ensure you sign-off when communication is complete	All
5.5.4	**Public Information Distribution**	
	5.5.4.1 City of Cave Junction statements of Policy for emergency actions	EAO
	5.5.4.2 Public Works Preparedness and Response Action Plan	EAO
	5.5.4.3 Standard Red Cross Emergency Brochures	EAO
5.5.5	**Information for Media**	
	5.5.5.1 Information as approved by Mayor, or Council	PIO
	5.5.5.2 Communicate road closures, high water, debris removal, proceed with caution warnings to media by phone, fax, or e-mail	PIO
5.5.6	**Media Spokesperson**	
	5.5.6.1 Mayor or designee assigned as PIO	MYR

6.0 EMERGENCY RESPONSE ACTION LEVELS

6.1 Emergency Response Action Plan, Level 1

Response coordinated by Department Supervisor. Uses supporting personnel as necessary. No contact with Mayor.

6.2 Emergency Response Action Plan, level 2

Response coordinated by E.A.O. or Department Supervisors. Emergency threatens city's set priorities. Mayor notified and all City resources activated.

6.3 Emergency Response Action Level 3

Response coordinated by Emergency Coordination Center and Incident Command System. The Mayor or Council representative, if in their judgement, a Level 2 response needs to be elevated to a Level 3, will notify the on-call member of the Josephine County Board of Commissioners. Public Works response coordinated as given in Level 2, with **DIRECT** communications with the Emergency Coordination Center and Incident Commander.

7.0 **EFFECTIVE DATE:** This policy, the procedures and work rules are effective from January 10, 2003, superceding the policy dated November 16,2001, and will remain in effect until changed, superceded, or rescinded.

ED FAIRCLOTH
Mayor

SECTION 7B

EMERGENCY PLANS AND PROCEDURES

1. GENERAL

Natural disasters, strikes, civil disorders, and equipment failures can cause emergency conditions. Emergency planning is essential to ensure continued effective operation and to avoid conditions that could have detrimental effects on the public health or environment.

2. CAUSES OF EMERGENCIES

Emergencies do not just happen - they have causes. Sometimes there are many individual causes, but some are similar in origin. Generally, emergencies can be grouped under, or related to, one of the following causes:

a. Natural Disasters

Natural disasters that are most likely to adversely affect the operation of treatment facilities include wind, rainstorm, snowstorm, fires, earthquake and flood.

In all cases, the distribution and treatment systems should be prepared to continue operation under emergency conditions caused by severe events.

Some national agencies and volunteer disaster relief organizations, such as the Red Cross, have information on the probabilities of, and planning for, natural disasters. Information is also available from the U.S. Army Corps of Engineers, the Office of Civil Defense, and the Departments of Interior, Agriculture, Commerce and Transportation.

b. Civil Disorders and Strikes

Civil disorders and strikes pose a new type of threat. A widespread civil disorder may result in the destruction of a pump station, the bombing of a power substation, or the dumping of toxic materials. A strike may result in the absence of personnel or blocked access due to picket lines. Any one of these actions, or others, could interrupt normal operation and lead to the pollution of the nearby environment.

c. Faulty Maintenance

The manner in which equipment is maintained will determine how well and how long it will adequately perform its intended function. Equipment will perform throughout its design period if it is well maintained. However, poor or faulty maintenance will shorten the expected life of the equipment.

EARTH QUAKES

In the event of an earthquake the main priority is to protect public health and safety by maintaining the integrity of the City of Cave Junctions Water Treatment and distribution system. Priorities should be as follows:

- Inform the public immediately that the Drinking water system may have been compromised and they should not drink the water. Direct them to safe sources of potable water
- Isolate Reservoir #4 the largest reservoir, this to limit the potential for catastrophic flooding because of water main breakage.
- Visually inspect reservoirs for structural damage, if structural integrity is of question isolate and drain reservoir. The only reservoir that should be of any question is reservoir #1. Since it is the oldest and is constructed of concrete.
- Isolate other reservoirs as needed to protect from water loss
- Evaluate the distribution system for damage, isolating areas wear major breakage of water mains has taken place.
- Make every available effort to maintain water to fire hydrants
- Turn all wells available on
- Well #4 is the only well that has emergency power in the case of power loss
- The Water treatment plant should be started and used to maintain water supply to distribution system.
- When the distribution system has been secured against major water loss reservoirs should be put back on line.
- Repair main water lines
- Repair laterals
- Repair individual services
- Contact the Oregon Health Division for direction

f. Negligent Operation

Certain procedures must be followed in order for the treatment facilities to operate in a satisfactory manner. Improperly following established procedures constitutes negligent operation.

In many cases, negligent operation may not be as noticeable as faulty maintenance. But because negligent operation could affect more units of operation before being discovered, the emergency condition resulting from it could be more severe. Sound operating procedures must be developed and followed to ensure satisfactory operation.

g. Accidents

Generally, accidents result in personal injury and property damage, both of which have a direct bearing on the system's operation. It is essential to have a well-developed safety program, and safety precautions must be consistently adhered to.

3. EFFECTS OF EMERGENCIES

There is a cause and effect for every emergency condition. Each cause may have several effects, and vice-versa. Table 1 shows the relationship of cause and effect. The most common effects of emergencies are described below:

a. Personnel Absence

An emergency condition that may lead to system failure could result if individuals are prevented from performing their assigned duties or are prevented from reaching the treatment facilities or a pump station.

b. Equipment Failure

Equipment failure will occasionally happen. Isolated equipment breakdowns can be repaired on a routine basis. However, equipment failure on a scale large enough to cause the shutdown of the collection or treatment system is of major concern.

c. Power Loss

A dependable and uninterrupted electrical power supply is essential for operation of the treatment system. Under normal conditions, this supply is usually available. In the event of a power outage, a propane-driven generator is available for emergency system operation.

d. Blocked Access

Blocked access refers to blocked routes or roads leading to the treatment facility or pump stations. If access is blocked, personnel cannot operate or maintain sewerage facilities.

e. Communication Loss

In day-to-day operations, communication plays an important role but is generally taken for granted. During an emergency situation, communication becomes even more important when attempting to implement emergency response plans.

4. REDUCING SYSTEM VULNERABILITY

This section discusses measures that may be taken to reduce vulnerability to an emergency situation.

a. Adequate Preventive Maintenance

An effective, organized preventive maintenance program helps extend the useful life of an item of equipment. It can also prevent emergency situations resulting from the unexpected equipment breakdown. Good records should be maintained on all pieces of equipment (refer to Maintenance chapter.) All preventive maintenance should be performed according to the equipment manufacturer's recommendations.

b. Standby and Redundant Facilities

Standby facilities include substitute equipment to be used when primary equipment fails. At a minimum, spare parts for all critical pieces of equipment should be maintained for emergency purposes. Critical equipment includes the chemical pumps, backwash pump and the telemetry and control system.

c. Warning Devices

Warning devices serve to warn not only of an existing emergency condition, but also of conditions that could lead to an emergency situation. Many types of devices are available, but generally they can be classified as follows:

i. Alarms - telephone dialers, horns and lights at control panels.

ii. Indicating lights – these tell the operator when power or equipment is on or off.

iii. Indicators - mechanical (gauges), electrical (counters, indicators, recorders), or electro-mechanical (flow and/or pressure recorders).

iv. Chlorine leak alarm light

Warning devices should be checked regularly to make sure that they are in good working condition.

d. Mutual Aid Agreements

There are many agencies and businesses within a community that can be very helpful during emergencies. Mutual aid agreements should be made with local construction contractors, electric, telephone, water and wastewater utilities, health departments, and police, fire and civil defense organizations. The agreements can include access to, or use of, emergency equipment and supplies, spare parts, specialized tools or mechanical devices, and communications system components.

Standard Operating Procedure

Topic: Hazardous Materials Response and Control Plan.

Introduction: The term "Hazardous Materials" describes a large variety of substances that pose an unreasonable risk to life, the environment, or property, when released from their container. These substances may fall into one or more of the following categories:

1. Explosives: A material capable of burning or bursting violently.
2. Gases: A formless atmosphere which occupies completely the space or an enclosure; an aeriform fluid that is in a gaseous state at a standard temperature and pressure, (flammable,nonflammable, poisonous, corrosive).
3. Flammable Liquids: Any liquid having a flash point below 100 degrees F.
4. Flammable Solids: Any material, other than an explosive, that is liable to cause fires through friction, retained heat from manufacturing or processing, or that can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.
5. Oxidizers: A substance which yields oxygen readily to stimulate the combustion (oxidation) of organic matter.
6. Organic Peroxides: An organic derivative of the inorganic compound hydrogen peroxide.
7. Poisons, Class A & B: Liquids, gases, solids, paste or semi-solid substances with the potential for danger to life or toxicity as to afford a hazard to health.
8. Etiological Materials: A living micro-organism that may cause human disease, e.g. germs.
9. Radioactive Materials: (R.A.M.) Any material that spontaneously emits ionizing radiation.
10. Corrosives: A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact or, in the case of leakage from its packaging, a liquid that has a severe corrosive rate on steel.
11. Miscellaneous Hazardous Materials: (N.O.S.) Not otherwise specified.

Illinois Valley Fire District: Recognizes that no single plan can provide the comprehensive guidance necessary for handling all hazardous material incidents. This plan is written with the intent that all personnel will have access to *Emergency Operating Procedures* that are consistent with the Department of Transportation Emergency Response Guidebook and the Oregon State Fire Marshals Office training program *"Hazardous Materials Operations and Awareness for First Responders."*

Will respond to emergencies involving hazardous materials in a defensive fashion to protect life, the environment and property, and to mitigate the hazard to the greatest extent possible.

Will provide initial *Incident Command*, contact other necessary agencies, coordinate the development of a *Unified Command* and / or transfer command as the situation dictates.

Recognizes its limitations in terms of training and specialized equipment, and will operate within its scope for the safety of all responding personnel as well as the general public.

Operating Procedures: Hazardous materials incidents need to utilize a systematic approach that contains all of the following considerations:

1. Approach the scene cautiously.
2. Detect Hazardous Materials present.
3. Identify the hazards.
4. Secure the scene.
5. Obtain help.
6. Determine a course of action.

1. Approach The Scene Cautiously: At every emergency response scene the potential for hazardous materials being involved is present. Emergency calls such as motor vehicle accidents, vehicle fires, structure fires (residential, commercial and industrial), spills, leaking trucks and medical calls should all be approached cautiously. While responding, attempt to gather as much information as possible in order to make an informed evaluation once on scene. A hazardous materials incident must be approached cautiously and size-up made from a safe distance. Advise all other responding units to stage at a safe distance. Avoid the urge to rush in before all the factors are known. If a potential hazardous materials incident is detected or the possibilities exist, the following procedures will apply:

Vehicle Position

Upwind, upgrade and upstream.
All vehicles and apparatus headed away from incident scene.

Distances

Open areas = 1000'
Residential = one block
Light commercial = one block
Large companies = 500'
Incident hidden by building = 500'
Stage incoming units at least 2,500' upwind of incident

2. Detect Hazardous Materials Presence: Use the following clues to detect the presence of hazardous materials:

A. Occupancy (type / location).
B. Container shape.
C. Marking and color.
D. Placards and labels.
E. Shipping papers.
F. Senses.

3. Identify The Hazards: The Incident Commander must make a careful size-up before deciding on making a commitment. The objective of the size-up is to identify the nature and severity of the immediate problem and to gather sufficient information to formulate a valid action plan. The potential for multiple hazards involved in a hazardous materials incident requires special consideration be given to the safety of emergency responders.

4. Secure The Scene: Hazardous materials incidents must be isolated. To accomplish this, three zones will be established to secure the area, the Hot Zone, the Warm Zone and the Cold Zone.

The *Hot Zone* is the area in which personnel are potentially in immediate danger from the hazardous condition. This zone is established by the Incident Commander and is controlled by the Fire Department. Access to this area is rigidly controlled and only personnel with proper protective equipment and an assigned activity will enter. On a hazardous materials incident that requires protective equipment other than firefighter turnout gear and self-contained breathing apparatus, the Hot Zone will be secured and entry will be denied until personnel with the appropriate protective equipment and training for entry, are on scene.

The *Warm Zone* is an area around the hot zone in which a lesser degree of hazards exist to personnel. All civilians will be removed from this area. The limits of this area will be enforced by law enforcement based on distances and directions established in consultation with the Incident Commander.

The *Cold Zone* is all of the area outside of the warm zone and is not controlled.

The *Evacuation Distances* will be established by recommendations listed in the Department of Transportation Emergency Response Guidebook. Keeping in mind that distance is an ally, the following perimeter distances will be used unless circumstances dictate they be increased:

Minor Incident:
Inner Perimeter = 100 feet in all directions.
Outer Perimeter = 1,000 feet from inner perimeter in all directions.
Total distance = 1,100 feet in all directions.

Major Incident:

Inner Perimeter = 500 feet in all directions.
Outer Perimeter = 1,000 feet in all directions from inner perimeter.
Total distance = 1,500 feet in all directions.

Incidents with Explosion Potential:

Inner Perimeter = One half mile in all directions.
Outer Perimeter = as necessary.

5. Obtain Help: Any operation that involves hazardous materials will require outside assistance, ie; Chemtrec, Department of Environmental Quality, Oregon Emergency Response System. These agencies must be contacted for all spills that pose a threat or will require clean up. Any spills that threaten or enter a water way require notification of the U.S. Coast Guard. These, and any other assistance that may be required, such as law enforcement or the Jackson county Hazardous Materials Regional Team #8, can be contacted through the Josephine County 911 Center.

In addition, the City of Cave Junction or the Josephine County Public Works Department and the Josephine County Sheriff will be utilized in the case of a hazardous materials incident, within the scope of their training and expertise.

6. Determine a course of action: Any effort made to rescue persons, protect the environment or property must be weighed against the possibility of becoming part of the problem.

A. Time must be taken to assess the incident scene, and what protective gear is required.
B. Firefighter protective gear has severe limitations when dealing with chemicals.
C. If you are not properly protected, Don't Go.
D. Failure to adhere to these principles may result in:
   1. Your no longer being an effective responder, but part of the problem.
   2. Requiring numerous responders to care for you.

7. Decontamination: Decontamination procedures that are consistent with training guidelines established by the Oregon State Fire Marshals Office *"Hazardous Materials First Responder Operations"* will be implemented when, contamination is known to have occurred or is suspected to have occurred. This decontamination will include all personnel, victims and equipment involved.

Conclusion: Every incident that we respond to has the potential of being a hazardous materials incident. Fire Department personnel should not enter the hazard area of a known or suspected hazardous materials incident until the material has been identified and the proper level of protective hear needed has been established. Use of inadequate gear can result in death or permanent disability. As firefighters we are sometimes, by the nature of our duties placed in dangerous situations. We can, however, alleviate some of the danger through proper training and by performing these duties in a safe manner. Remember, we are not expendable.

GASOLINE, DIESEL OR MOTOR OIL SPILLS

PURPOSE: To give the operational entities the knowledge to mitigate spills of gasoline, diesel, motor oil and other lubricating or operational fluids consistent with motor vehicle and farm machinery operation.

OBJECTIVE: To specifically outline procedures to comply with accepted hazardous material protocols.

I. If the estimated volume is over 42 gallons, OARS must be called (1-800-452-0311). To notify OARS, you radio Josephine County 911 to call OARS if you are on a scene.

II. If the estimated volume is under 42 gallons, we can handle per the following procedures:

A. If the spill is between approximately 15-42 gallons, call DEQ (776-6010).
B. Stop the rate of spread of the product.
C. Dike or control the flow.
D. Protect the area from the public.
E. Flag the area for DEQ.

NOTE: Smaller spills - you can put sand, dirt or some other absorbent material on the products. Notify DEQ of the location of the spill by phone upon returning to the station.

NOTE: If any product enters or comes close to a water way, this incident must be reported to OARS and DEQ (776-6010).

IF YOU HAVE ANY QUESTIONS ON SCENE, CONTACT THE HAZARDOUS MATERIAL TEAM THROUGH JOSEPHINE COUNTY 911.!!!

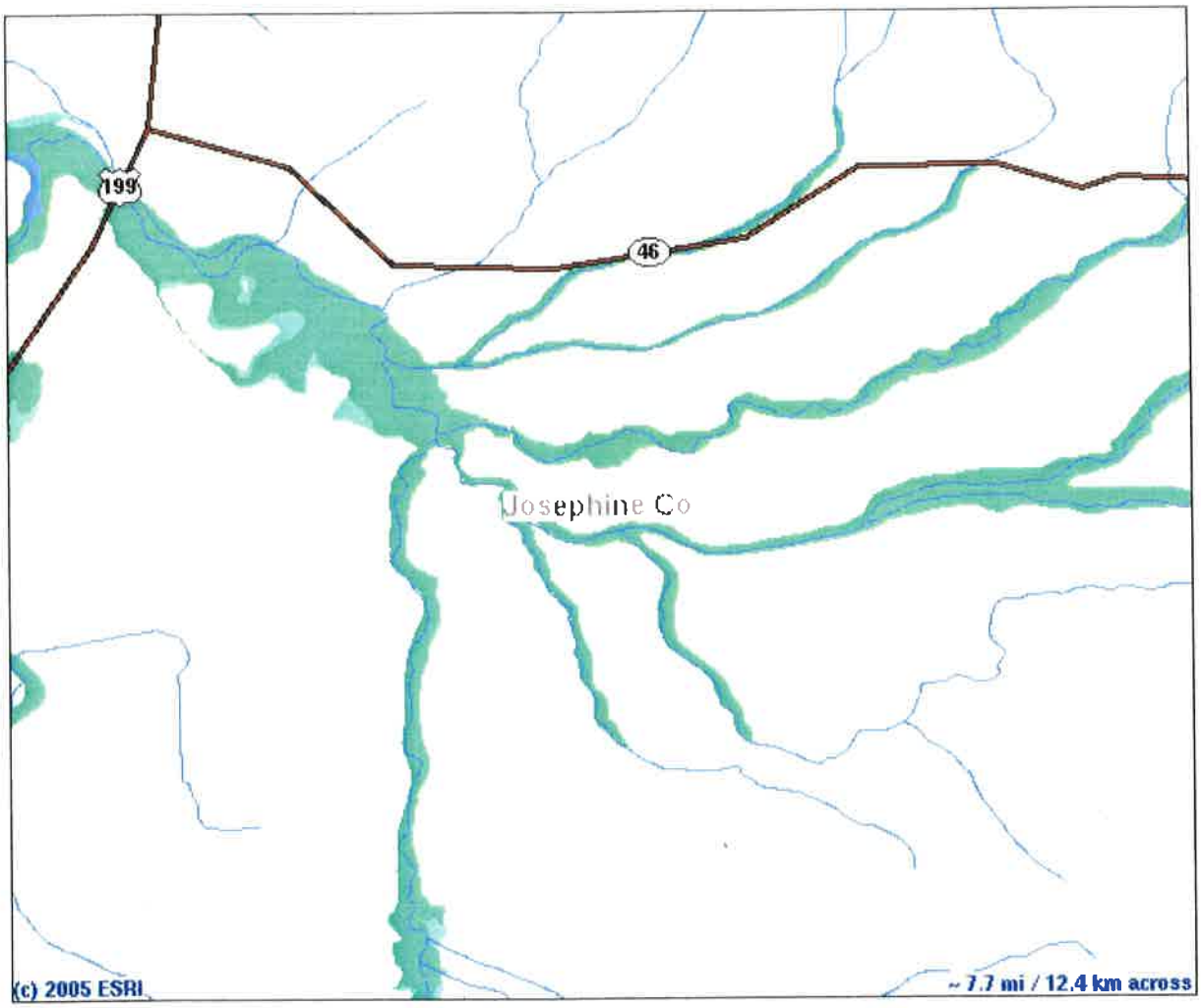
Appendix D: Aerial Photos, Maps and Diagrams

ESRI and FEMA

do you know your RISKS?

Hazard Information and Awareness

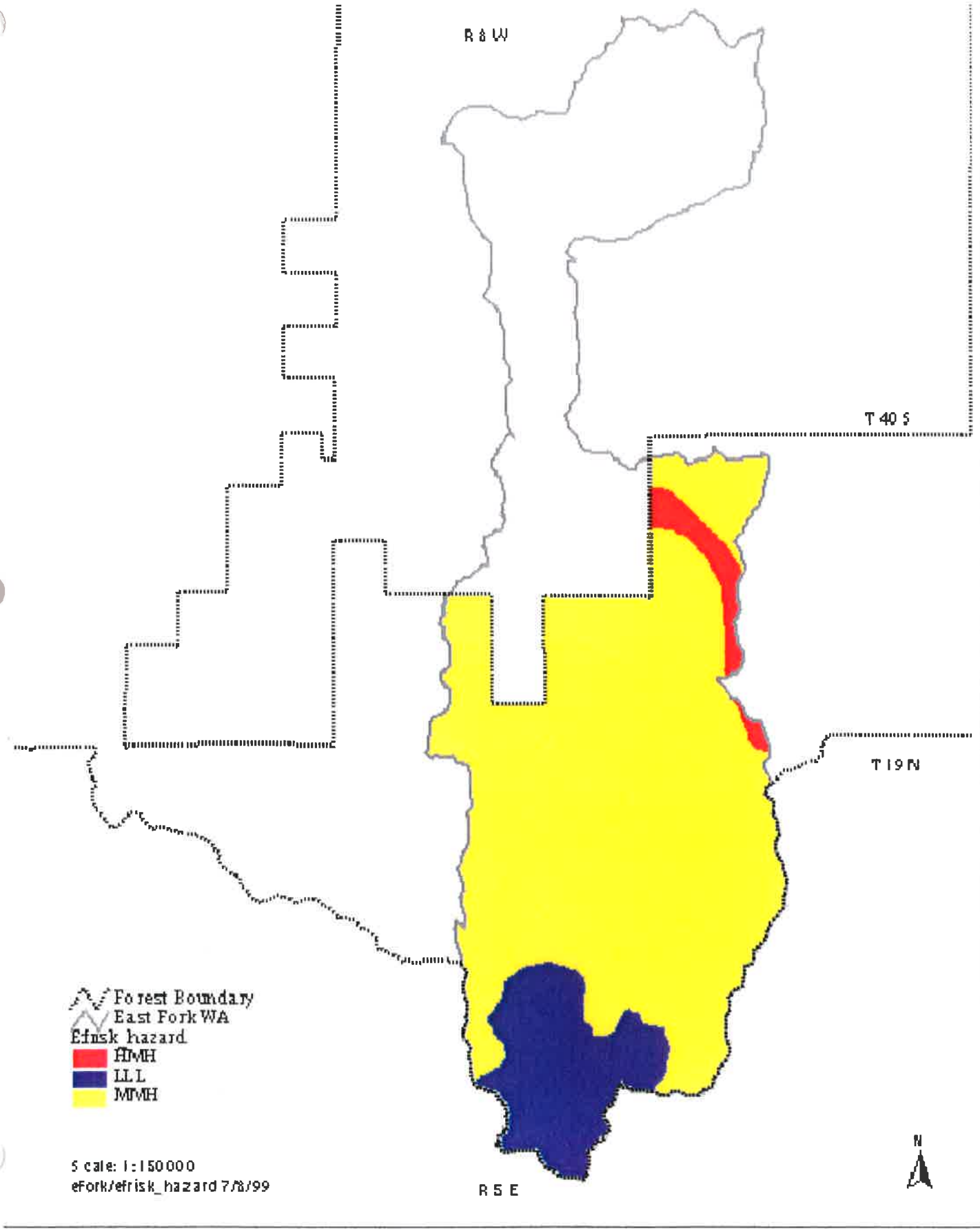
Flood Hazard Map



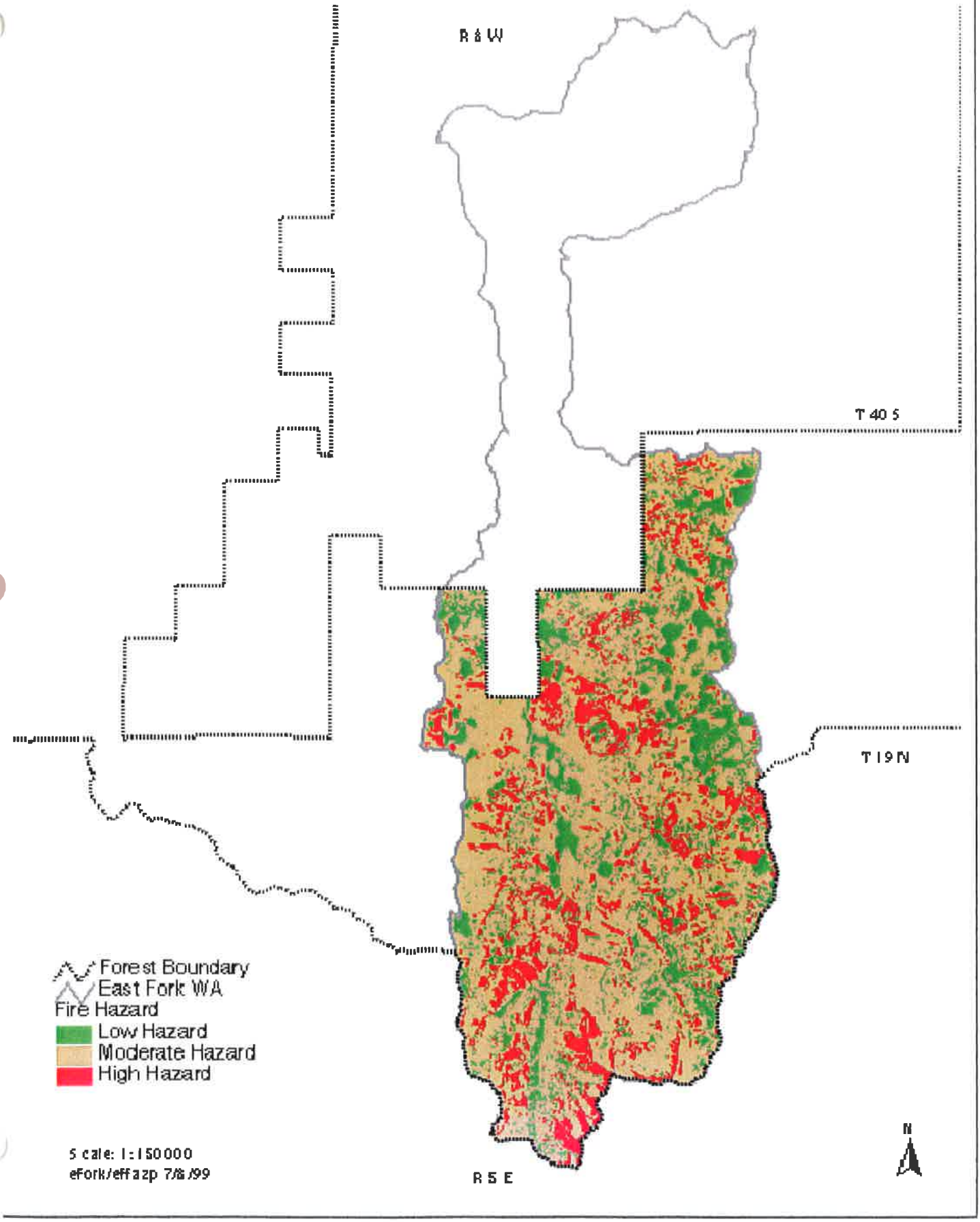
Map Centerpoint: -123.59689, 42.12194
Map Produced: Mon Aug 8 09:52:59 2005

ESRI/FEMA Project Impact
Hazard Information and Awareness Site
http://www.esri.com/hazards

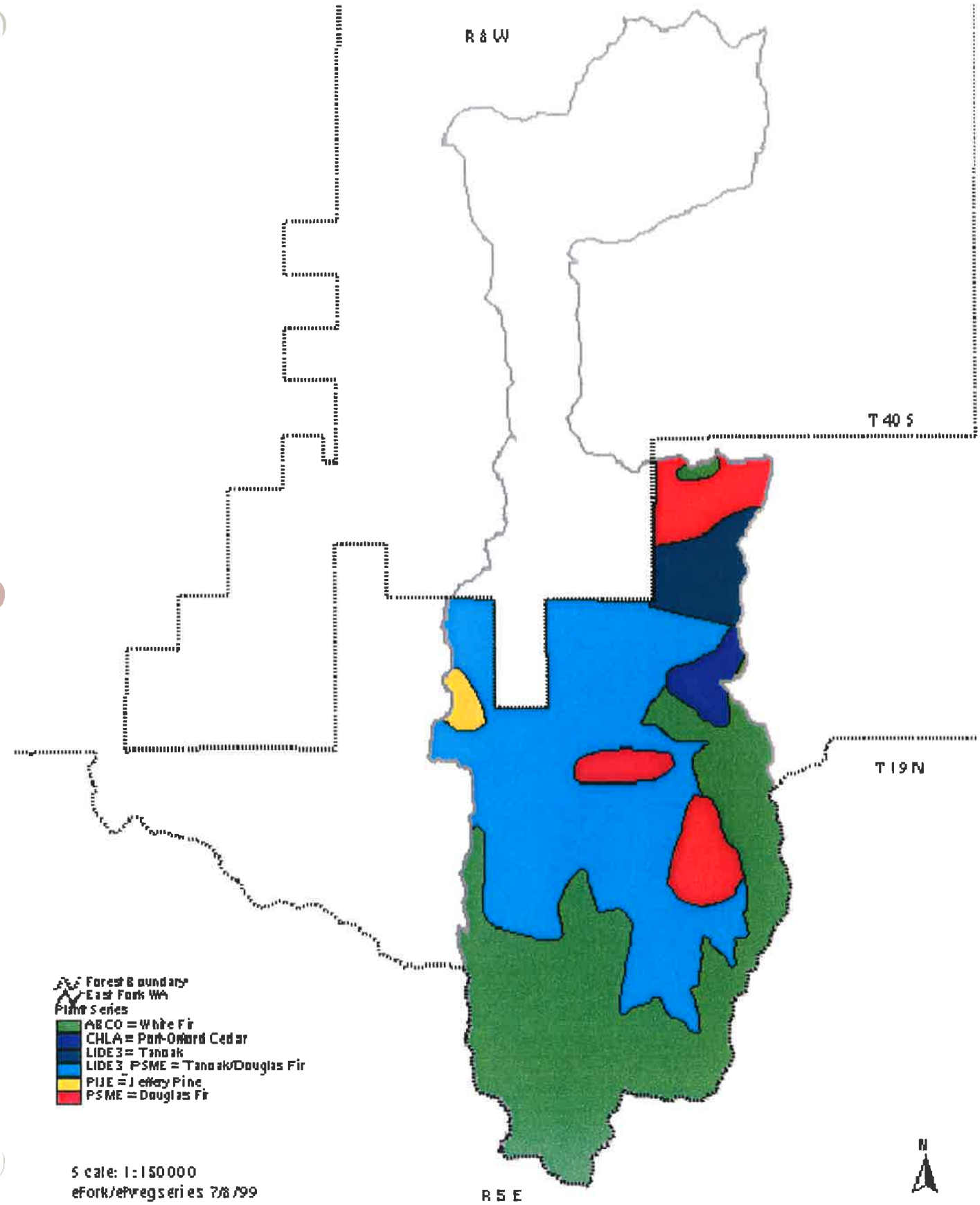
East Fork Watershed Analysis
Wildfire Risk Analysis Map



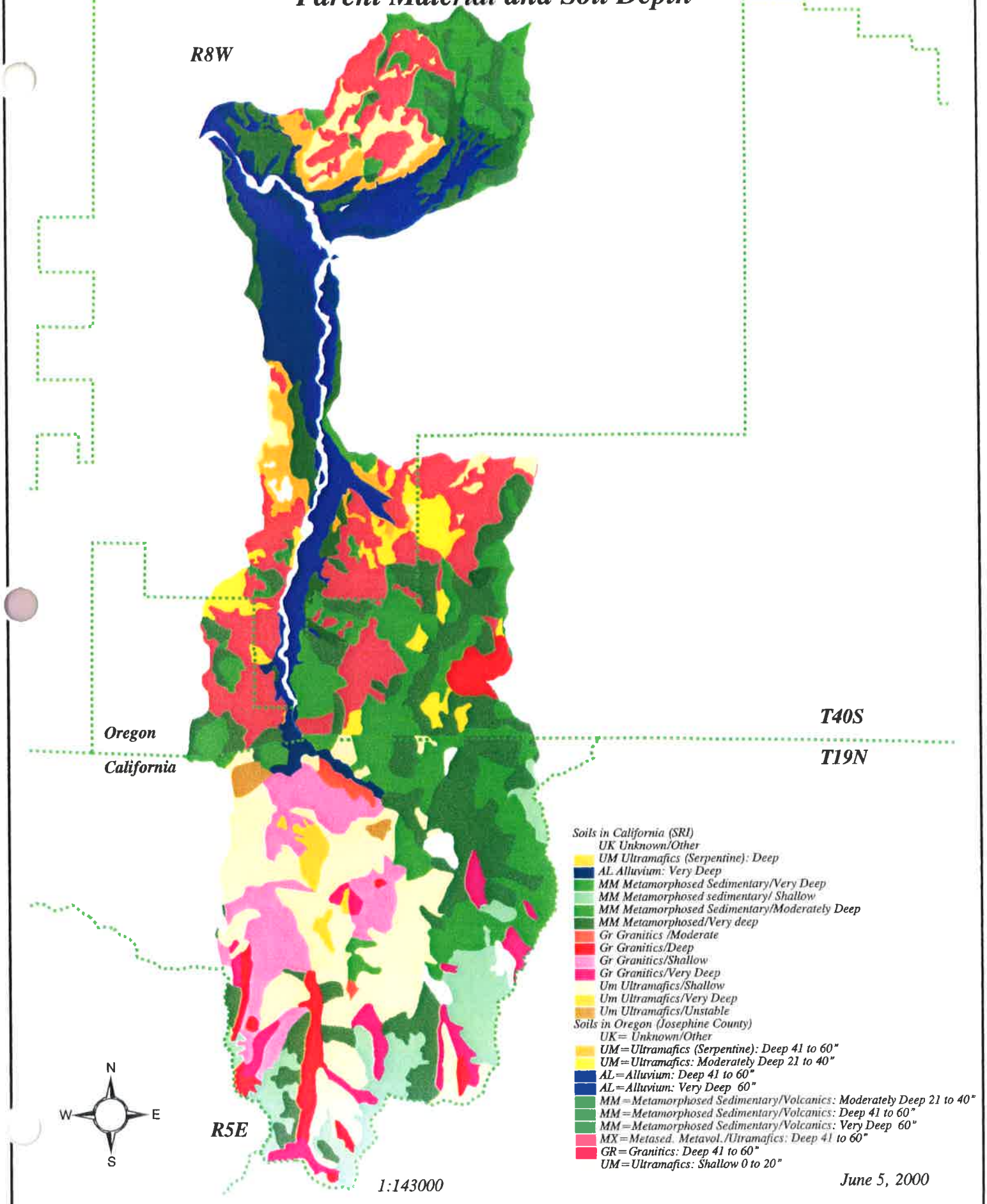
East Fork Watershed Analysis
Fire Hazard Levels



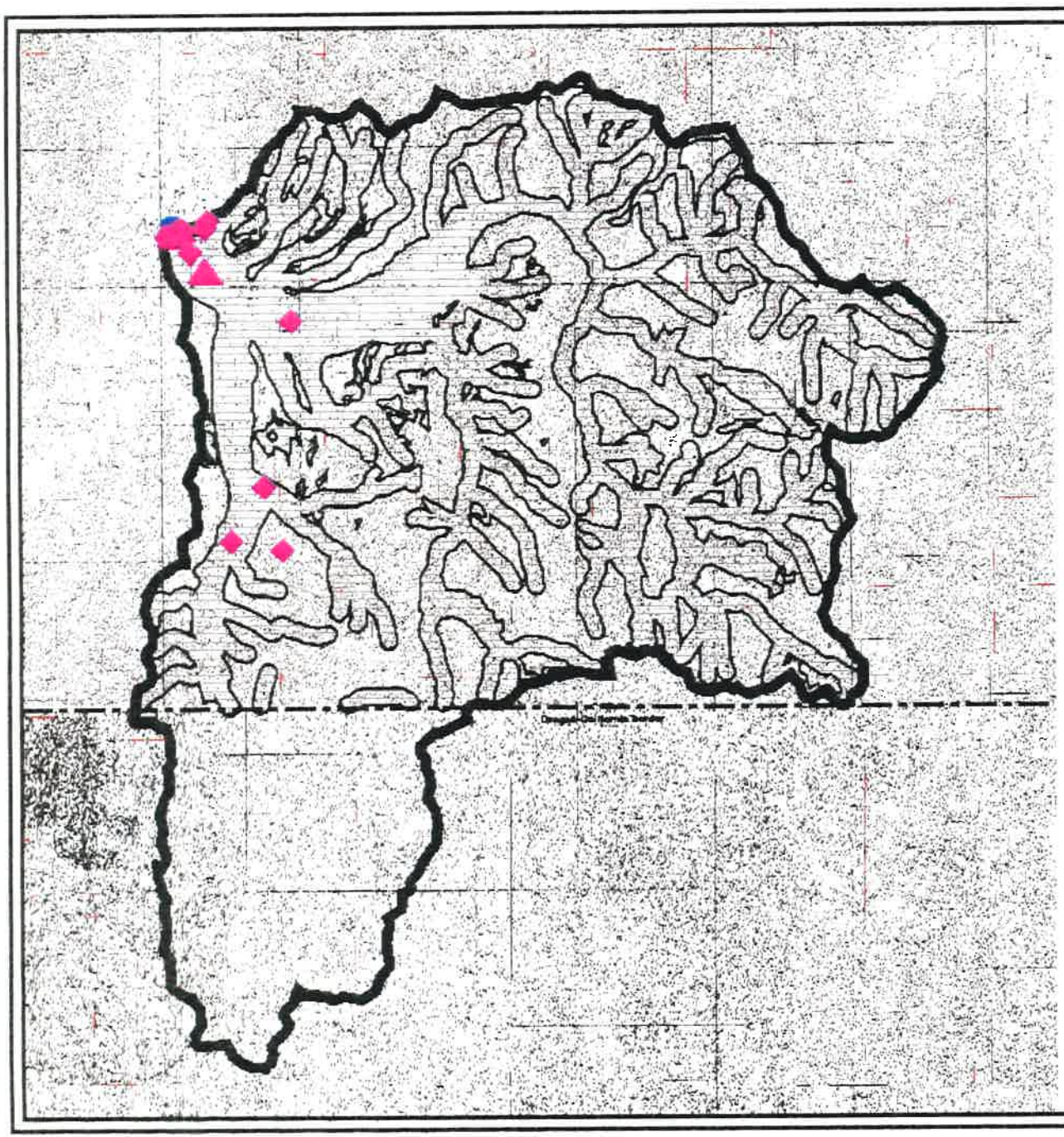
East Fork Watershed Analysis
Plant Series



East Fork Illinois Watershed
Parent Material and Soil Depth



June 5, 2000



Source Water Assessment Results

City of Cave Junction's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

PWS 4100971

- Drinking Water Protection Area
- Drinking Water Intake - Surface Water
- Sensitive Areas
- Area Feature (see Note 2)
- Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

Kilometers
0 1 2 3 4 5 6 7 8

DEQ

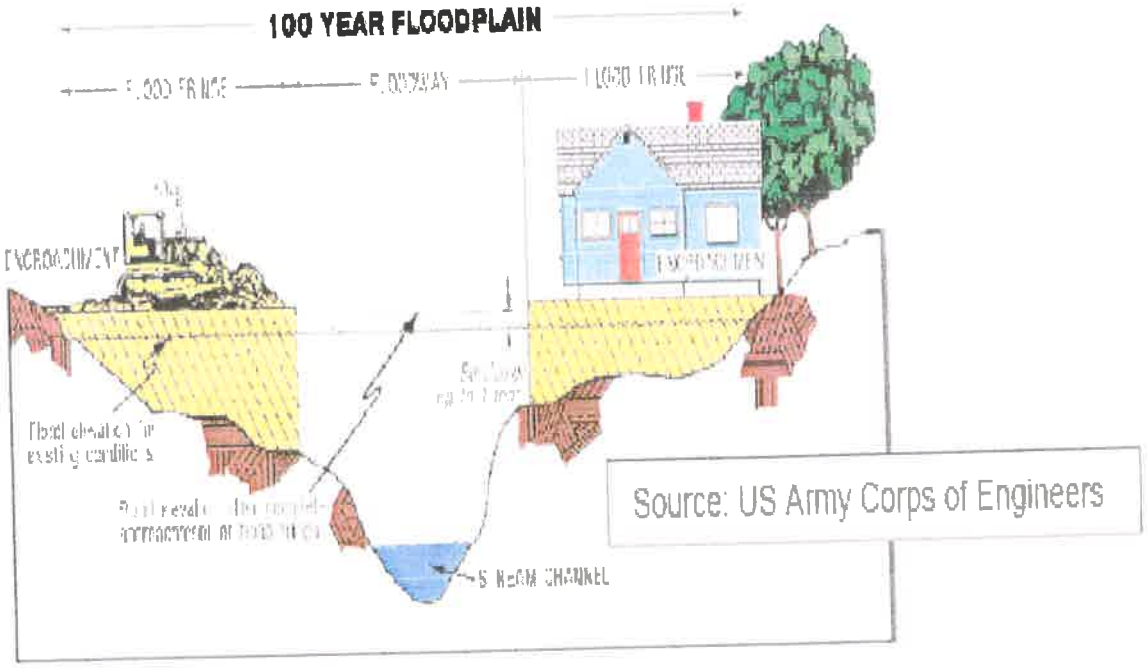
0 1 2 3 4 5
Miles

Printed March, 2003

Oregon Department of Environmental Quality GIS

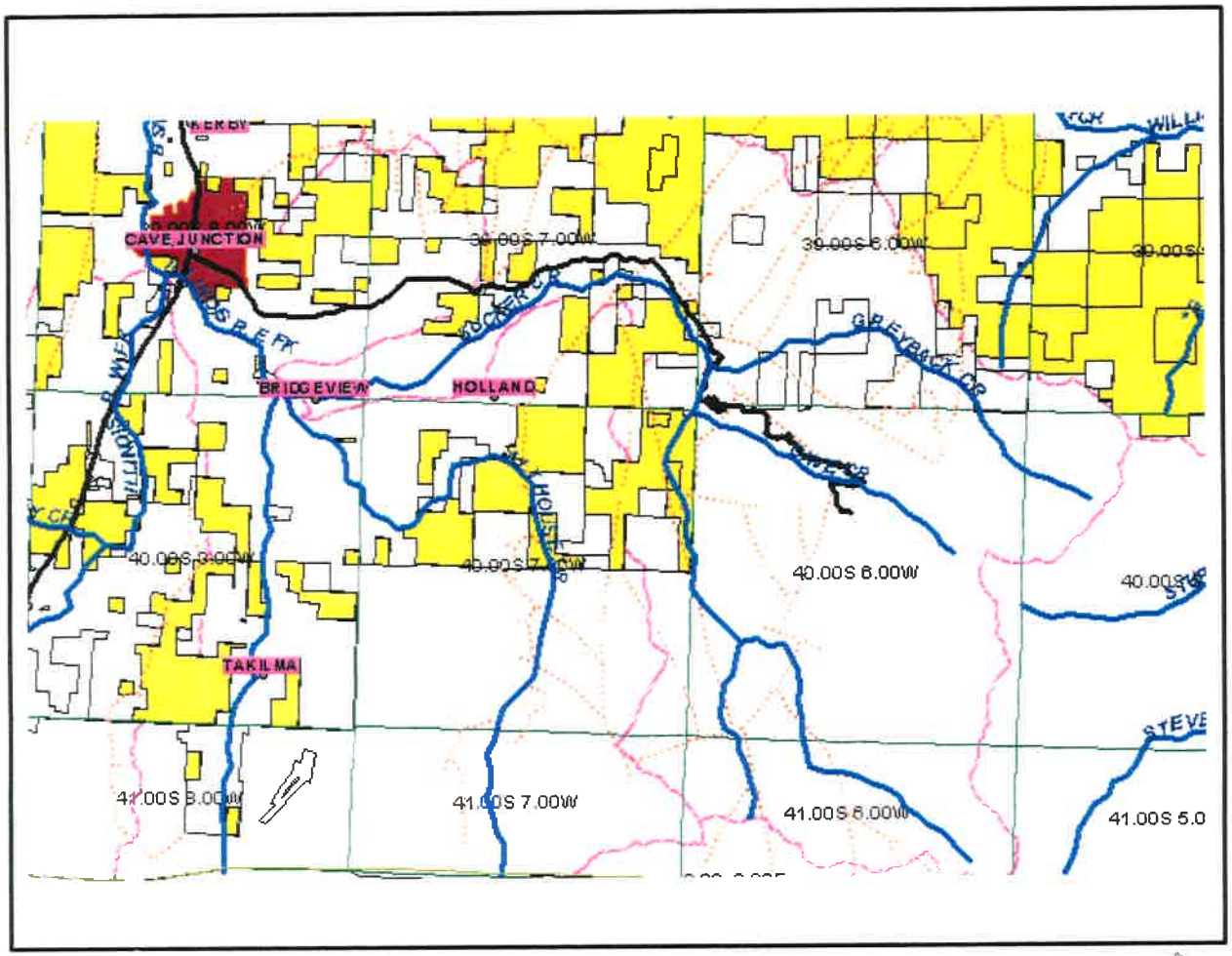

USGS

Floodplain Diagram:



ESRI ArcExplorer 2.0

Cave Junction Source Water Protection Map



- County Boundary
- cities (CITY)
- Rivers (PNAME)
- ROADS/ HIGHWAYS
- faults
- township_range (TR)
- blmlands
- ugb
- west_forestown
- hydro_units_5th

Monday, Jul 18 2005