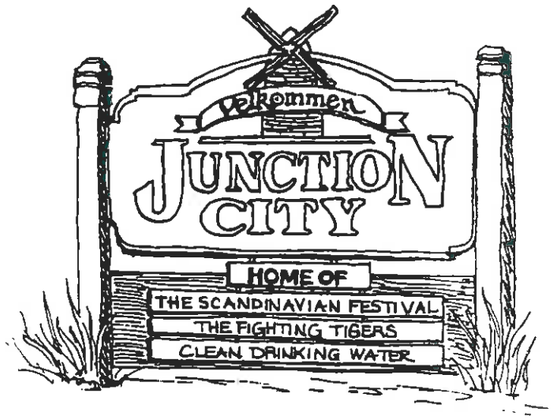
Junction City Drinking Water Protection Plan



October 1997

Prepared by
Lane Council of Governments

Abstract

Groundwater is a critical natural resource that provides domestic, industrial, and agricultural water supplies. It is in every community's interest to develop a program that protects this valuable resource against contamination. In response to the federal Safe Drinking Water Act of 1986, the Oregon Department of Environmental Quality (DEQ) launched a new state voluntary drinking water protection program, which includes a certification process for local jurisdictions. Rather than a mandated *top down* approach, the program is built on the premise that local communities are best able to identify and address groundwater contamination concerns within their areas, with the assistance of technical expertise from state or federal agencies. Junction City recently completed these efforts, which resulted in this document, the *Junction City Drinking Water Protection Plan* (Plan).

The DEQ and the Oregon Health Division (OHD) developed a guidance manual to assist local communities in voluntarily preparing a drinking water protection program. Through a grant from the Environmental Protection Agency (EPA), Junction City was selected to conduct a pilot project of testing the use of the *Oregon State Wellhead Protection Program Guidance Manual* in developing a drinking water protection plan.

A Drinking Water Protection Committee, representing diverse interests, led the development of the Junction City Drinking Water Protection Plan and formed the basis for implementing the plan's strategies. As the first stage in developing the plan, the Oregon Health Division completed the *delineation*, or determination of the area on the surface of the ground which overlies the aquifer that supplies groundwater to the well. The next steps for the committee were to inventory the potential sources of groundwater contamination and assess each source to determine the level of risk it poses. The committee then developed targeted management strategies aimed at minimizing the risk of groundwater contamination. The management strategies developed by the committee emphasize education as the primary tool for prevention. This emphasis is based on the belief that if everyone does their part, Junction City will have safe drinking water into the future.

The management strategies, together with a contingency plan and plan for future water system needs, form Junction City's Drinking Water Protection Plan. Although every community is different, this plan provides a potential model for other communities to develop their own drinking water protection program.

Acknowledgments

The completion of this document was accomplished through a combined effort of federal, state, and local agencies, and private citizens. Development and production of the document was made possible with funding assistance from the Environmental Protection Agency (EPA) in a contract granted to the Lane Council of Governments (LCOG).

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Junction City Drinking Water Protection Plan

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October 1997

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Preface

The Environmental Protection Agency awarded a grant to the Lane Council of Governments to provide assistance to the cities of Junction City and Coburg to develop drinking water protection plans. Located at the southern end of the Willamette Valley in Oregon (refer to Vicinity Map), both cities depend on groundwater for their drinking water supply.

The State of Oregon invited Junction City and Coburg to participate in a pilot project to test the use of the *Oregon State Wellhead Protection Program Guidance Manual* to develop a drinking water protection plan. This selection was due to both cities' demonstrated interest and commitment to being proactive in protecting their drinking water supplies. The diversity of land uses near the cities makes each location ideal for a pilot study. The proximity of the cities to one another provides the start of a regional look at protecting groundwater as a drinking water supply.

The drinking water protection plans will help protect the cities' drinking water from potential sources of contamination. Few communities have drinking water protection programs and this effort aims to get the communities actively involved. This project will provide valuable feedback to the State in developing Oregon's drinking water protection approach.

The city councils of Junction City and Coburg appointed advisory committees to work with technical experts to develop the drinking water protection plans. These special citizen committees included key interests and stakeholders and was composed of local residents, business owners, industry, and elected officials. Committee members were from the cities and from the surrounding rural areas affected by the plan. The OHD, DEQ, Department of Agriculture (ODA), and EPA provided technical assistance.

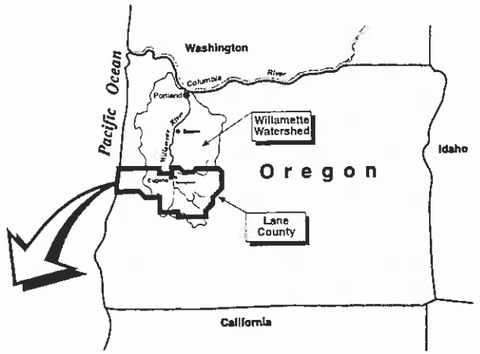
The Junction City and Coburg Drinking Water Protection Committees played key roles in tailoring the plans to fit local conditions and priorities. Each plan is unique, although they share many similarities. The committees first studied the local groundwater characteristics and inventoried the potential sources of contamination. Then, working in subcommittees, they considered the array of possible management strategies and recommended those they felt would be most effective for their community. The committee members continue to serve a valuable role after completion of the plans; specifically, the members will ensure implementation. Their commitment to advocate and implement the Plans will be instrumental in protecting their communities' drinking water.

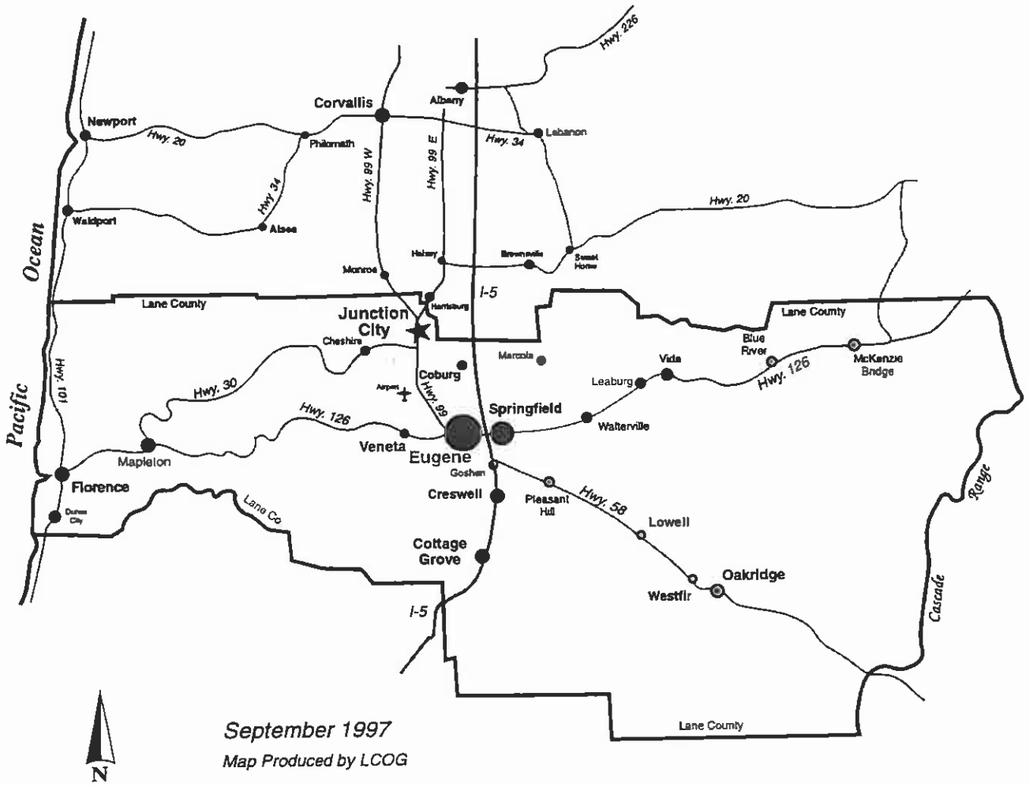
Junction City Drinking Water Protection Committee:

Brad King, Chair
Alfred Christensen
Herb Christiansen (non-voting member)
Gerald Edwards
Beverly Ficek
Don Fisher
Doug Graves
Les Howard
John Lagerquist
Sandy O'Malley
Bob Nelson
Pat Straube
Margaret Thumel
Carla Wahl
Russell Weber
Winn Wendell
Corky Wilde

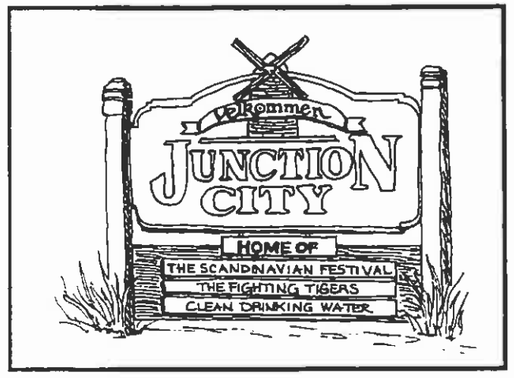
Junction City Drinking Water Protection Plan

Vicinity Map





Chapter 1



Introduction

Introduction

This document is organized into seven Chapters:

Chapter One, Introduction, provides the background and purpose of the Junction City Drinking Water Protection Plan (Plan). In addition, this chapter outlines the Plan's organization and describes the process used in its development.

Chapter Two, Public Participation, provides the background on how the Junction City Drinking Water Protection Committee (Committee) was selected and the interest groups represented. In addition, it contains an overview of how the community was involved and informed of the Plan's development.

Chapter Three, Delineation, provides a summary of the delineation process and results.

Chapter Four, Inventory, identifies potential contamination sources within the drinking water protection areas for existing wells and describes the methodology used to gather potential contaminant information.

Chapter Five, Management of Potential Sources of Contamination, includes the goals and specific management strategies for agricultural, industrial/commercial, public, and residential land use activities.

Chapter Six, Contingency Plan, identifies primary threats leading to the disruption and/or contamination of Junction City's water system and details protocols to be used in the event of an emergency.

Chapter Seven, New Well Recommendation, provides an analysis of a proposed new well site based on specific criteria related to groundwater protection. A recommendation for the selection of a new well is also included in this chapter.

Background

Groundwater is a critical natural resource that provides domestic, industrial, and agricultural water supplies. According to the Oregon Health Division (OHD), there are 3,450 public water systems in Oregon. About 88 percent of these systems depend on groundwater for at least some part of the drinking water. This includes 77 percent of Oregon's population (Department of Environmental Quality (DEQ), 1996). It is in every community's interest to develop a program that protects this valuable resource against contamination.

The federal Safe Drinking Water Act of 1986, requires that every state have a drinking water protection program in place to guard against contamination of groundwater. The DEQ initially believed a mandatory drinking water protection program was needed to meet requirements of the Safe Drinking Water Act. The concept failed in the 1993 State Legislature and the DEQ developed a voluntary program.

Included in the new state voluntary drinking water protection program is a state certification process for local jurisdictions that develop plans. The DEQ and OHD Administrative rules provide the framework for developing a drinking water protection program leading to this certification. The voluntary drinking water protection program is built on the belief that local communities are best suited to developing their own drinking water protection program based on the needs and land uses within the community. The DEQ and OHD developed a guidance manual to assist local communities in following these rules and preparing a drinking water protection program. Through a grant from the EPA, Junction City was selected to conduct a pilot project to test the use of the *Oregon State Wellhead Protection Program Guidance Manual* (Guidance Manual) to develop a drinking water protection plan.

Purpose

The overriding purpose of this project is to develop a drinking water protection plan for Junction City. Communities throughout the state and other parts of the country are viewing Junction City as a potential model from which they can develop their own drinking water protection plans. There are six primary goals of this project:

- Delineate the drinking water protection areas for Junction City's existing and potential future well sites.
- Conduct drinking water protection area inventories, identifying potential sources of groundwater contamination within the delineated area and risks associated with those potential sources.
- Develop management strategies for the drinking water protection area of the existing wells.
- Evaluate and analyze the potential new well site and recommend the selection of a new well site from a groundwater contamination risk perspective.
- Develop a contingency plan for possible interruption and/or contamination of the water supply system.
- Provide feedback to the state and federal partners in the study (DEQ, Oregon Department of Agriculture (ODA), OHD, and Environmental Protection Agency (EPA)) on the effectiveness of the Guidance Manual.

Community Sketch

Map 1 displays the location of the Junction City Drinking Water Protection

Plan study area. Junction City is a small community located nine miles north of the Eugene/Springfield metropolitan area. The city's main transportation route, Highway 99/Ivy Street, bisects the central portion of the city and is the focal point for current commercial and industrial development. Radiating outward from this Central Business District, commercial, and industrial uses give way to residential development and then to predominately agricultural uses outside of the city limits. Local residents value the small-town feel of the community, as well as the ready access they have to goods and services and to the economic opportunities of the nearby metro area.

According to 1994 population calculations, Junction City has 3,845 residents. The 1990 population within the city's urban growth boundary (UGB) was 4,596 people, and by the year 2015 it is projected that 7,732 people will live within the UGB (Junction City Strategic Plan, 1995). There are approximately 2,354 jobs, compared to 1,853 workers, making the city a net importer of workers from the surrounding area. Recreational vehicle manufacturing and sales, and passenger vehicle sales comprise a major portion of industrial jobs in the area.

Junction City, like many small cities, relies on groundwater for its municipal water supply within the city limits. This water is obtained from both deep and shallow municipal supply wells within the city limits. Land uses in the area in a two-year time-of-travel (TOT) period, are predominantly commercial/industrial and residential with some agriculture. As the boundaries for the TOT move to five- and ten-year increments, commercial and industrial uses give way to residential and agricultural uses. Nearly all development in or around Junction City is within at least the ten-year TOT.

Natural Environment

Junction City is located in the southern Willamette Valley, between the mountains of the Coast Range and the Cascade Range. The valley in the vicinity of Junction City is characterized by a relatively level alluvial plain and is traversed by several small creeks and areas of standing water. The remainder of this section provides an overview of Junction City's surface water drainage, geomorphology, and soils. The delineation chapter, chapter three, includes additional information on the natural environment of the region.

Surface Water Drainage

The central feature of the regional drainage system is the Willamette River. This area has a long history of seasonal flooding - it has only been within the last 20-30 years that flooding has been relatively controlled in the area. Human alteration of the natural drainage pattern of the Upper Willamette Drainage Basin has consisted of a balancing of development and flood control needs. Between the 1940s and the 1950s, the Army Corps of Engineers dammed the headwaters of the Willamette River in five places to provide flood control and storage of irrigation water. Additional damming on

Groundwater is the sole source of drinking water for residents of Junction City and the surrounding area.

the McKenzie River makes for a total of seven flood control reservoirs upstream from Junction City.

Junction City is situated between the Willamette River (2 miles east of the city) and the Long Tom River (3 miles west of the city). Surface water features in Junction City include two intermittent streams and the two artificial lakes that serve as the city's sewage lagoons. The water table in the vicinity of Junction City is generally within 20 feet of the land surface at most times of the year and extends above the ground surface in some local areas, particularly in winter along the minor streams.

Flat Creek is an overflow channel of the Willamette River with two seasonal branches, channels F1 and F1b, flowing through Junction City in a northwesterly direction. The two channels of Flat Creek have been modified to carry floodwater through the city. These relatively flat channels meander through the city, forming the basis of the city's stormwater drainage system. Other components of the drainage system include a system of pipes and some open ditches that discharge into the local creeks. A seasonal channel of Crow Creek also flows in a northwesterly direction through the city. The city's sewage lagoons currently discharge into Crow Creek during the winter months, eventually ending up in the Willamette River.

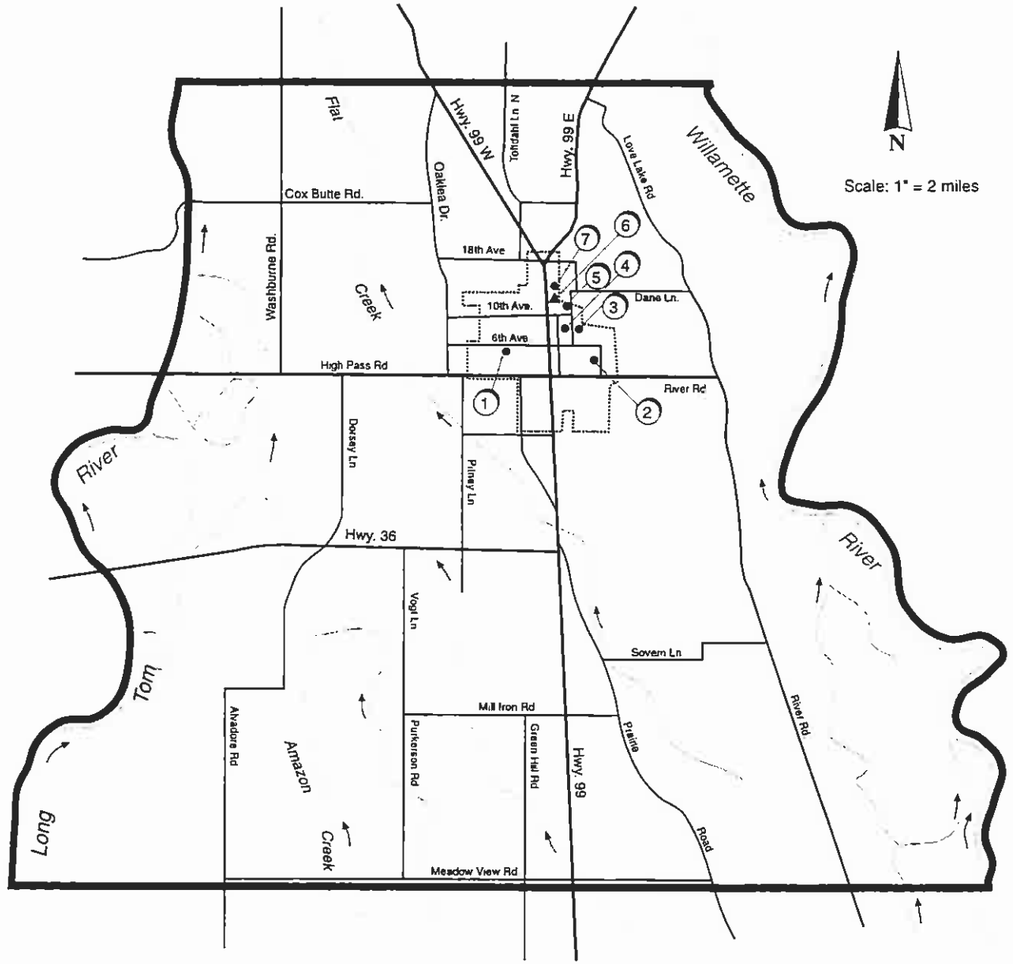
Geomorphology and Soils

The Willamette River has been the primary influence on the geomorphology and soils of the Junction City area. Viewing the landscape in terms of geomorphic surfaces can be helpful to get the big picture of the soils occurring over a broad area. Soil scientists use the term geomorphic surface to describe a landform or group of landforms formed by the same processes and which represents an episode in landscape development.

Most of the soils within the drinking water protection area for Junction City are on the Winkle geomorphic surface, the highest and oldest terrace of the Willamette River. The Winkle is an abandoned floodplain of the Willamette river formed from sediments deposited by the river about 5,000 to 10,000 years ago. It is the oldest surface related to the present drainage system.

The soils on the Winkle surface are alluvial—deep and well-developed. The surface has been stable for enough time for clay formation and horizon formation to occur. Soils range from poorly drained (Awbrig and Conser) to moderately well-drained (Coburg) to well-drained (Malabon and Salem). The soils generally trend from well-drained closer to the river in the eastern part of the drinking water protection area, to more poorly drained farther away from the river in the western part of the drinking water protection area.

The predominant soil in the drinking water protection area is Malabon, a deep, well-drained, medium-textured soil that is suitable for intensive agriculture. Malabon has a high agricultural productivity and can be used for many crops, including small grains, orchards, grass seed, and irrigated row crops. The primary crop on the poorly-drained soils is grass seed.



Map 1
Junction City Drinking Water Protection Plan
Study Area Map

Wellhead Key

1. 5th and Maple Well
2. 3rd and Cedar St. Well
3. 8th and Deal Wellfield
4. 8th and Front St. Well
5. Elm St. Well
6. Reservoir (625 MG)
7. 13th and Elm St.

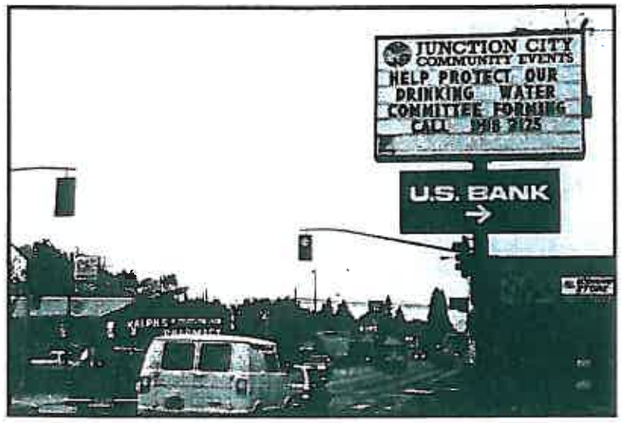
Legend

- Study Area Boundary
- Major River or Creek
- Junction City Limits
- City Well or Wellfield
- Reservoir

Map Produced by LCOG September 1997

Junction City has been aware of threats to its groundwater supply even before the initiation of the Drinking Water Protection Plan. Citizens have been monitoring local water quality by participating in a voluntary nitrate testing program. In 1995 the city updated its Strategic Plan based upon findings from a Strengths Weaknesses Opportunities and Threats (SWOT) analysis. The Strategic Plan indicates that improving the city's sewage collection system and treatment plant is a priority for increasing urban development opportunities. The Strategic Plan also revealed numerous comments from the community about the poor taste of local water; this taste is probably caused from minerals in the water, combined with the taste of chlorine. Although the Plan is not likely to change the taste of the water in Junction City, residents could be informed of home treatment units that will improve the taste at the tap.

Chapter 2



Public Participation

Public Participation

Forming the Drinking Water Protection Committee

Recruitment for the Junction City Drinking Water Protection Committee (Committee) began in spring 1996. Several approaches were employed to attract members of the community who are representative of the multiple interests involved. These tools include an article in the *Tri-County News*, distribution of flyers to school children, presentations at the Kiwanis Club and the Senior Nutrition Site, and an announcement on the community marquee. Residents in the study area who participated in voluntary nitrate testing through the Lane County Extension Service also received letters. Finally, the Public Works Director and City Administrator conducted individual recruitment by telephone.

Representation of Interests

This voluntary program is built on the premise that many people doing their part will make a difference in protecting groundwater resources. The area that influences the municipal water supply wells is much larger than the political boundaries surrounding Junction City. The drinking water protection area includes the entire urban area, as well as the area beyond the city's UGB (see Map 2). Committee members include both residents and members of responsible management authorities from Junction City and Lane County to address the diversity of land uses and affected parties. The 17-member committee's representation is broken down as follows:

Government

- Junction City Council (three members)
- Junction City Planning Commission (one member)
- Lane County Planning Commission (one member)

Community

- Commercial/Industrial (three members)
- Agriculture (three members)
- Urban Residential (two regular members and one non-voting member)
- Rural Residential (three members)

In January 1997, four subcommittees were formed from the Committee. These subcommittees are charged with generating management strategies for sections of the Plan. The four subcommittees are:

- The Contingency Plan/New Well/Municipal Use Subcommittee,
- The Commercial/Industrial Use Subcommittee,
- The Agricultural Use Subcommittee, and
- The Catch All Subcommittee (Residential Use, Public Participation, Community-Wide Strategy Development).

Committee members get view of drinking water protection area from a groundwater perspective during a field trip.

Community Involvement

Community involvement and support is vital to the success of the Plan, and ultimately, for the protection of groundwater quality. The Committee has met monthly since its kick-off meeting in October 1996. The Committee facilitates community support for the planning process by undertaking the following activities:

Meetings
- The Committee welcomes all community members who want to attend committee or subcommittee meetings.
- The Committee regularly sends meeting packets (agenda, minutes, etc.) to anyone who requests to be put on the mailing list.
- Meeting notices are posted at City Hall and at the Junction City Library.

Media
- *Tri-County News:* Provide information/interviews to *Tri-County News* for one or more articles on the Plan. Explore the possibility of an insert.
- *High School Newspaper:* Provide information/interviews to the Junction City High School newspaper.

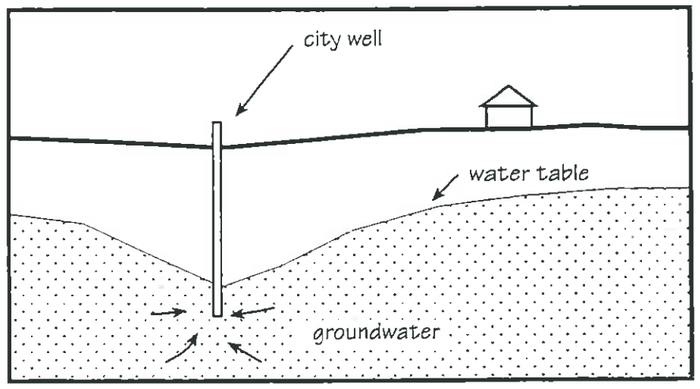
Groundwater protection tips are included in the City's monthly water/sewer/ garbage bills.

Coordinate groundwater tips for:
- Inclusion in water/garbage bills and
- Submittal to local newspapers.

Coordinate Presentations to Local Organizations
- Kiwanis and Senior Nutrition Site
- Explore possibility of presentations to the Lions, the Soroptomists, and the Business and Professional Women's Organization

Occurring concurrently with the formation of the Committee was analysis to clearly define the area of the aquifer from which Junction City obtains its water. This process is discussed and presented in the following chapter.

Chapter 3



Delineation of Junction City's Drinking Water Protection Areas

Delineation of Junction City's Drinking Water Protection Areas

Junction City's six wells produce water from extensive aquifers that occur beneath the city. Given that these aquifers extend for hundreds of square miles, protection of their entire extent is impractical. Instead, those portions of the aquifers that actually yield water to the City's wells need to be identified. The purpose of the delineation process is to determine the drinking water protection area. This is the area on the surface that directly overlies that part of the aquifer(s) that supplies groundwater to the wells. The delineated area is divided into TOT zones to indicate the amount of time it takes groundwater to move from that zone to the pumping well. It is within the drinking water protection areas that a contaminant, if released, could migrate down to the aquifer and travel to the well. The delineated drinking water protection areas and the TOT zones allow the City to focus its management strategies and resources on the area(s) where the most benefit to the drinking water resource will occur.

Technical guidelines for completing the delineation are contained in the Guidance Manual. Although the Guidance Manual provides minimum requirements and direction on how to conduct the delineation, each community is unique with respect to how the delineation process is carried out. Junction City's delineation applies to Junction City only because it is based on information and conditions within the local area.

The OHD performed the delineation process to identify the drinking water protection areas for Junction City's existing wells and a potential new well site. These drinking water protection areas are shown on Map 2. The scope of work for Junction City's drinking water protection area delineation included collection and evaluation of data, development of a hydrogeologic conceptual model, and computer modeling of the drinking water protection areas for each well site.

Collection and Evaluation of Data

To develop a model consistent with the local hydrogeology, it is necessary to collect information from an area large enough to identify the major hydrogeologic features that control the distribution and flow of groundwater in the area. The study area for Junction City's delineation is bounded by both natural and arbitrary features: on the east by the Willamette river and on the west by the Long Tom River; the northern boundary is three miles north of the city limits of Junction City and the southern boundary is Meadow View Road. This area is displayed on Map 1.

Well reports (well logs) on file at the Watermasters office in Lane County, were examined for existing wells within the study area. Other sources of information included published reports and discussions with City officials, local area residents, and the Lane County Extension Service. From the data available, 29 wells were selected for water-level measurements to determine the configuration of the water table and the direction of groundwater flow. Pump tests previously performed on behalf of the City provided data that allowed the estimation of aquifer characteristics.

Development of a Hydrogeologic Conceptual Model

The conceptual model is developed using the existing data for the area and consists of a three-dimensional portrayal of the groundwater system beneath the area. The conceptual model synthesizes available information from well reports, water level measurements from wells and other surface water bodies, aquifer testing, and previous hydrogeologic investigations. It identifies the individual aquifer and nonaquifer units, the water table, groundwater flow direction, sources of recharge, areas of discharge and boundaries of the aquifer(s). Creation of the conceptual model is necessary to transform the groundwater flow system into a mathematical model that represents the physical processes operating within the subsurface.

The conceptual model for the Junction City area indicates that the city rests on a thick section of alluvial deposits that rests on older sedimentary and volcanic rock units. The city's wells produce from the alluvial section that in this study is divided into a shallow 50-foot thick sand and gravel aquifer that is underlain by a 50- to 75-foot thick clay or silt dominated unit that in turn is underlain by a thick (-150 feet) sand-dominated unit. The shallow sand and gravel aquifer was identified throughout the region and supplies many domestic wells in the area. This aquifer also is the source of groundwater for the Elm Street well, the city's primary source. Given the shallow nature of this aquifer and the permeability of local soils, this source should be considered highly susceptible to contamination from the surface. The clay-dominated unit has low permeability and only locally supplies water to wells. The sand-dominated aquifer supplies water to the City's five other wells: 13th and Elm, 5th and Maple, 8th Street, 8th and Deal, and 3rd and Cedar. The sand aquifer is highly productive, but thins to the south and southwest where it is replaced by a lower permeability clay-dominated unit. Data indicate that the upper sand and gravel aquifer behaves as an unconfined aquifer while the deeper sand aquifer behaves as a leaky confined system.

Infiltration of precipitation dominates the source of groundwater in the area, although underflow from the south and discharge from the Willamette at high stage also contribute. Water level measurements during this study indicated that groundwater is flowing in a north-northeast direction. Previous reports, however, indicated that a seasonal variation in groundwater flow occurs, varying from a northeast to north-northwest direction.

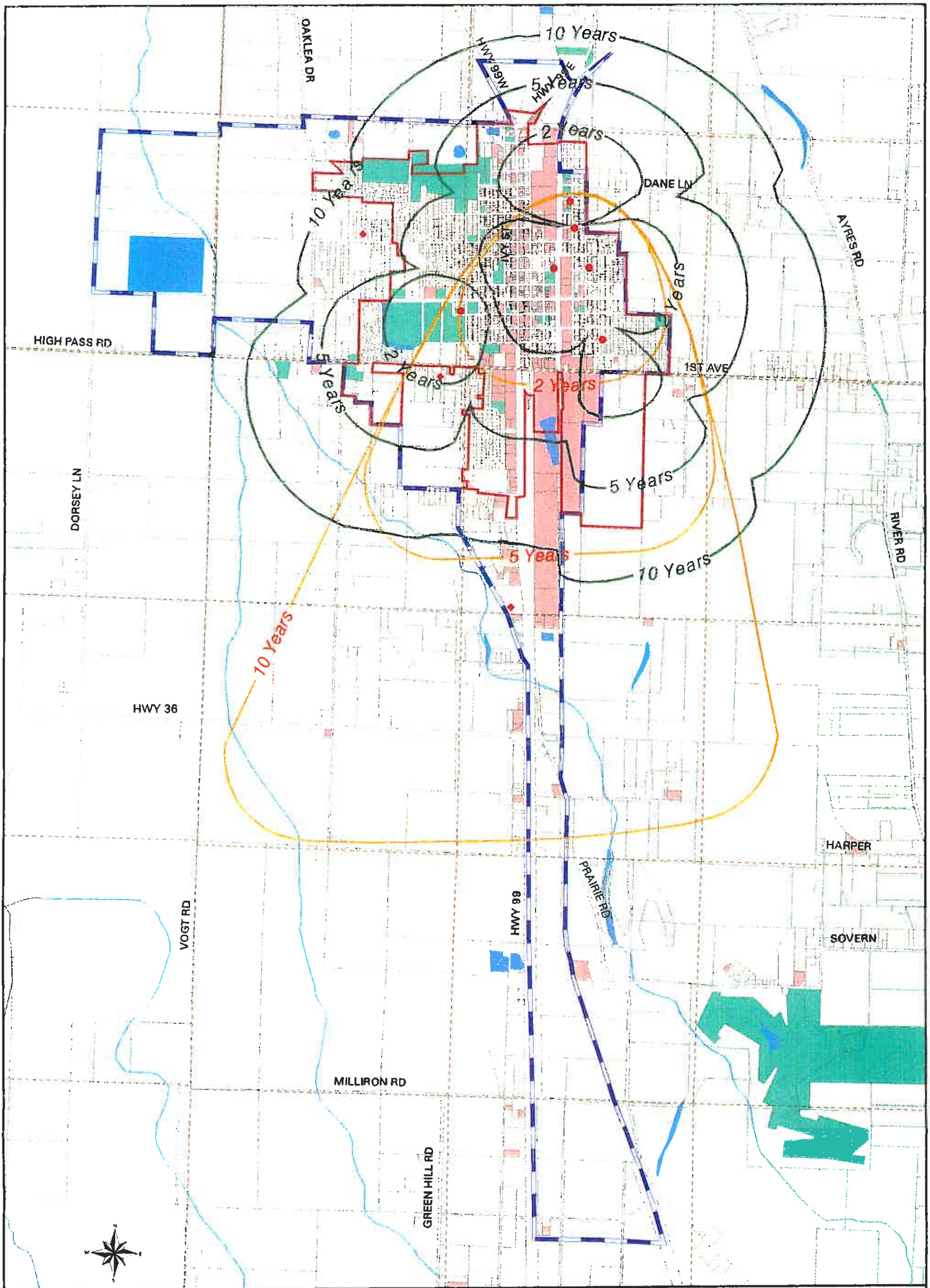
Computer Modeling of the Drinking Water Protection Areas

The drinking water protection area for the Elm Street well, drawing water from the shallow unconfined sand and gravel aquifer, was modeled using the two-dimensional analytical model MWCAP. The deeper leaky-confined aquifer was modeled using the two-dimensional analytical model GPTRAC. In both cases, two-year, five-year and ten-year TOTs were determined. Delineations using two groundwater flow directions, N35E and N13W were

combined into one drinking water protection area, to take into account seasonal variations in groundwater flow direction. Parameters used in both models included the pump rate, effective porosity, transmissivity (the ability of the aquifer to transmit water), gradient direction and magnitude, and aquifer thickness. The GPTRAC models considered the potential interference of other wells.

In addition to delineating the drinking water protection areas for the city's existing wells, computer models of the drinking water protection areas of a hypothetical well located along Highway 99 south of the city were performed. One of the drinking water protection areas was calculated assuming that the well was drawing water from the shallow aquifer; the other assumed the deeper zone was the source. These predictive drinking water protection areas will allow the City to evaluate that particular site in terms of potential risk to the water source.

The resulting drinking water protection areas provided Junction City's Drinking Water Protection Committee with defined areas in which to focus management strategies to protect groundwater. To further the analysis of potential risks to groundwater contamination, the next step was to conduct a land use inventory within the drinking water protection areas. This process and the results are presented in the following chapter.



GENERALIZED LAND USE AND GROUNDWATER TRAVEL TIMES

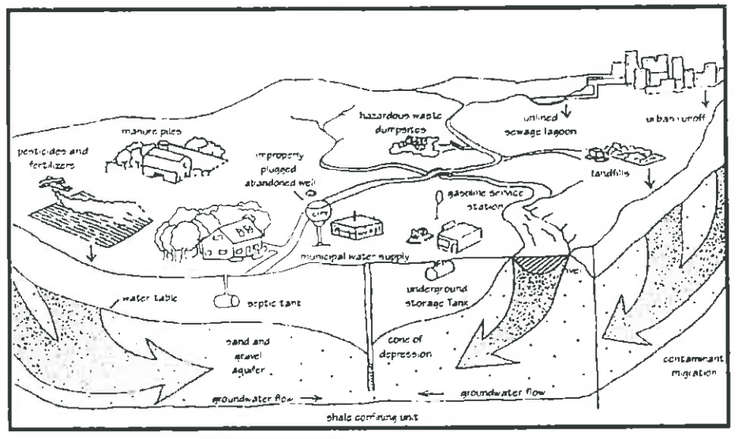
SCALE: 1 inch = 2000 ft

- Residential
- Commercial/Industrial
- Agriculture and Vacant
- Municipal and Other
- Municipal Supply Wells
- Private System Wells
- Time-of-Travel Zones
- Shallow Aquifer
- Deeper Aquifer
- Urban Growth Boundary
- City Limits
- Taxlots
- Section Lines

Lane Council of Governments, 8/97

Map 2

Chapter 4



Drinking Water Protection Areas Inventory

Drinking Water Protection Areas Inventory

The inventory focuses on the drinking water protection areas for the shallow aquifer well and the deeper, confined aquifer wells. The purpose of the inventory was to identify potential groundwater contamination sources by examining land uses. Past, existing, and future land uses were plotted and assigned risk ratings within the delineated drinking water protection areas. These risk ratings were assigned from the Guidance Manual. In developing risk ratings for differing types of land use for the Guidance Manual, the DEQ used Oregon-specific data, as well as EPA guidance to develop a list of types of potential sources in each risk category. Criteria for placement in the specific categories was limited to historic release data and potential contaminant characteristics. The potential risk ratings assume that the facility or activity does not employ good management practices or pollution prevention because it is the potential risk that is being identified.

Methodology

Past, current, and potential future land uses were identified through a variety of methods. The inventory process did not include a visual inspection of sites for individual contamination sources. This decision was based on the determination that a visual inspection would be too invasive to be acceptable within the local community. It was also determined that the inventory goal could be accomplished by other means such as sharing local knowledge about potential contamination sources and management practices. Assumptions were made about particular types of land uses and risks associated with those land uses. Assumptions are discussed further in the results portion of this chapter. The process for completing the inventory is summarized as follows:

- Developed a 1":300' base map showing the delineated areas, TOT zones, tax lots, roads, and addresses;
- Reviewed aerial photographs (dated 1956, 1964, 1994). Note: The aerials worked well combined with local resident interviews. They were useful as a memory jogger rather than being able to identify specific historic or existing land uses directly from the photos;
- Long-time local residents identified past land uses;
- Divided drinking water protection areas into general types of land use (commercial/industrial, agricultural, and residential);
- Sub-committee plotted more specific types of existing land uses for each tax lot in the delineated drinking water protection areas;
- Assigned high-, medium-, or low-risk ratings to each land use according to the Guidance Manual;
- Reviewed Comprehensive Plan Diagram to identify potential future types of land use;
- Reviewed and allowed adjustments for risk ratings (no adjustments made); and

- Plotted information from state agency data bases. Data plotted include:
  - Leaking underground storage tank (LUST) sites - DEQ, 1987-1996;
  - Registered underground storage tank sites - DEQ, as of 2/96;
  - Above-ground fuel storage tank sites - State Fire Marshall, as of 4/96;
  - Hazardous materials (HAZMAT) use sites - State Fire Marshall, as of 4/96;
  - Hazardous materials spill sites - State Fire Marshall, 1986-1996;
  - Environmental cleanup sites - DEQ, as of 4/96; and
  - Water discharge permit sites - DEQ, as of 4/96.

Results

As has been noted, the inventory process did not include an attempt to identify specific potential contamination problems at specific sites such as facilities that do not safely store potentially hazardous materials. However, some assumptions were made about particular types of land use. For example, it is assumed that rural residences associated with farming operations have specific potential contamination sources such as fuel storage, chemical storage and mixing areas, and machinery repair shops. It should also be noted that although the inventory depicts existing agricultural uses (crops grown), these are likely to undergo continual change due to normal crop rotation practices. What is irrigated (medium-risk) farm land now may be non-irrigated (low-risk) farm land next year, or vice versa.

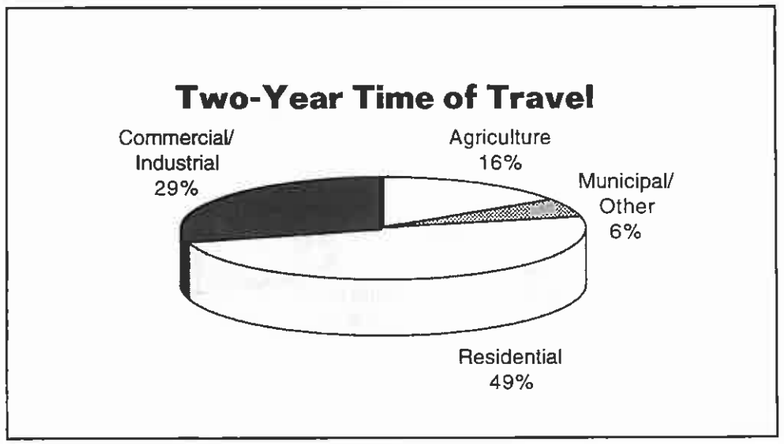
The results of the inventory were analyzed in terms of current, past, and future land uses; their TOT relationship to the well site; and their associated risk rating. In general, land uses that are closest to the well and those with the highest risk rating pose the greatest threat to a safe drinking water supply. Land uses within the shallow aquifer protection area also present a greater risk than those in the deeper aquifer wells. Inventory results are summarized below.

Shallow Well

Within Two-Year Time of Travel

This area has the highest concentration of risks in this well's delineated zone in terms of both industrial/commercial businesses and other contamination sources. Commercial and residential land uses dominate this region with a small amount of agricultural land.

Figure 1: Land Use, Shallow Aquifer Two-Year Time of Travel Zone



Contamination travels more quickly to shallow, unconfined aquifers than to deeper, confined aquifers.

- **Industrial/Commercial Businesses**
  High risk —11
  Medium risk — 17

- **Total Residences** — 775

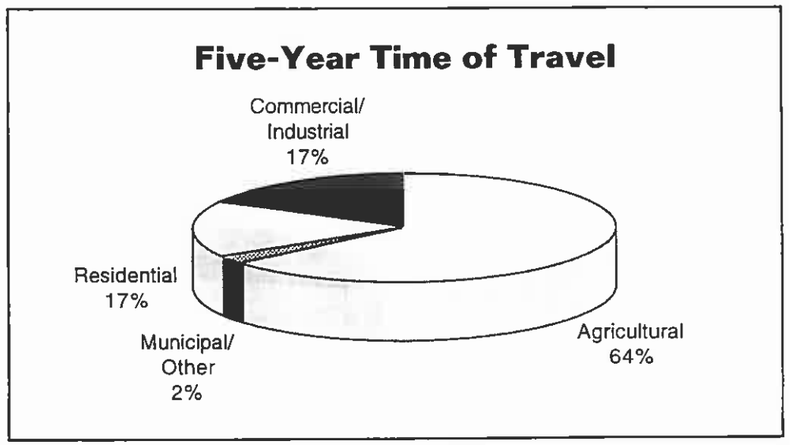
- **Rural Residences** — 8
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

- **Other Contamination Sources**
  Leaking underground storage tank — 5
  Environmental cleanup (DEQ) — 2
  Historic underground storage tank/gas station — 5
  Underground storage tank (DEQ) — 13
  Hazardous materials (Fire Marshall) — 9
  HAZMAT incident (State Fire Marshall) — 4

Within Five-Year Time of Travel

This area has numerous high and medium risks associated with commercial/industrial businesses and other contamination sources. About two-thirds of the region is in agricultural land use; the other third is approximately evenly split between business and residential use.

Figure 2: Land Use, Shallow Aquifer Five-Year Time of Travel Zone



- **Industrial/Commercial Businesses**
  High risk — 8
  Medium risk — 9

- **Total Residences** — 522

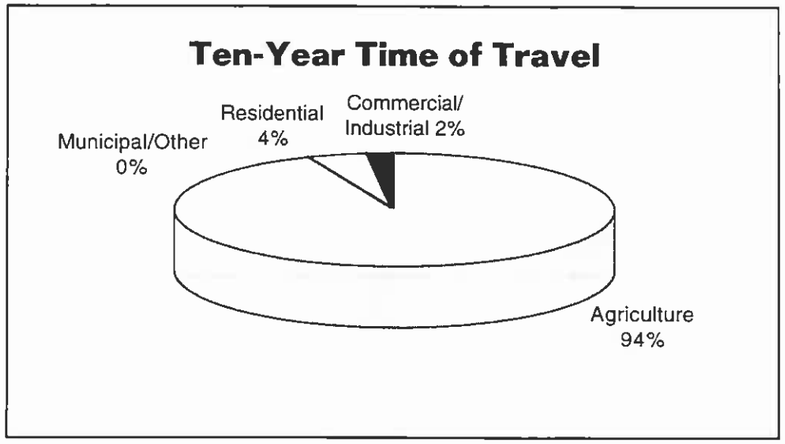
- **Rural Residences** — 26
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

- **Other Contamination Sources**
  Environmental cleanup (DEQ) — 1
  Underground storage tank (DEQ) — 3
  Hazardous materials (Fire Marshall) — 2
  HAZMAT incident (State Fire Marshall) — 1

Within Ten-Year Time of Travel

There are a few risks associated with commercial/industrial businesses and no known other contamination sources. The region is predominantly non-irrigated agricultural land with a relatively small amount of commercial/ industrial and residential land uses. Of note are the many rural residences in this area.

Figure 3: Land Use, Shallow Aquifer Ten-Year Time of Travel Zone



- **Industrial/Commercial Businesses**
  High risk — 2
  Medium risk — 5

- **Total Residences** — 118

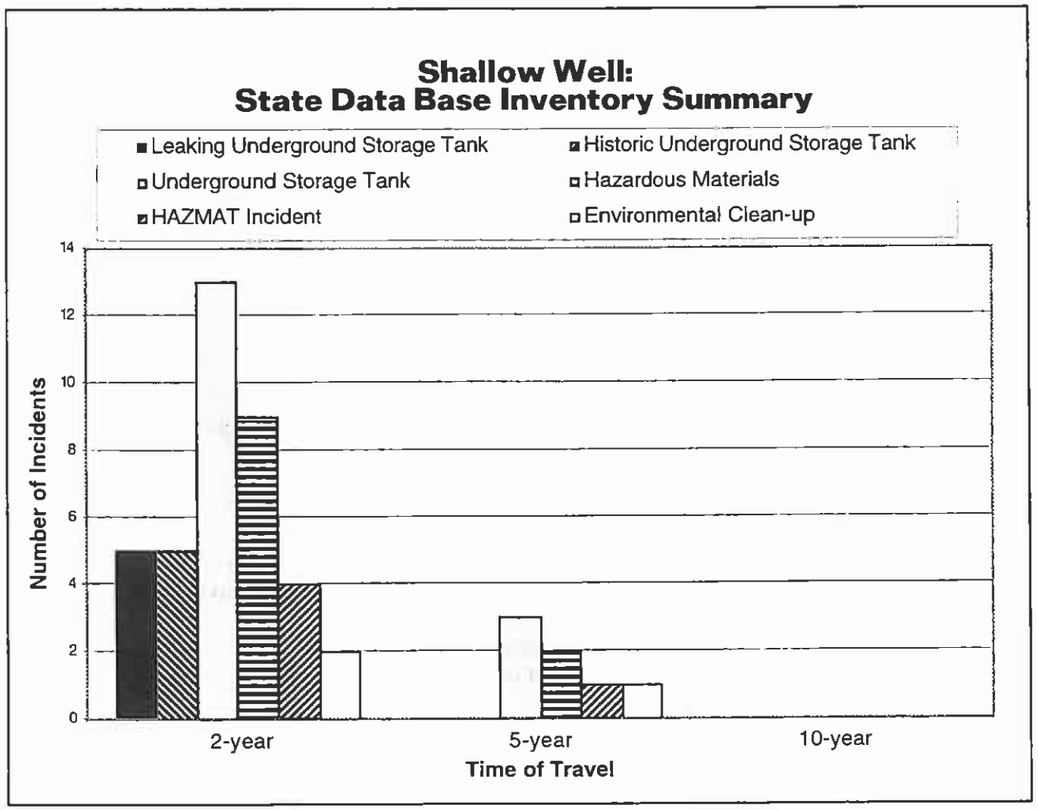
- **Rural Residences** — 54
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

- **Other Contamination Sources**
  Leaking underground storage tank — 0
  Environmental cleanup (DEQ) — 0
  Historic underground storage tank/gas station — 0
  Underground storage tank (DEQ) — 0
  Hazardous materials (Fire Marshall) — 0
  HAZMAT incident (State Fire Marshall) – 0

State Data Base Inventory

The State Data Base Inventory Summary (Figure 4) indicates that in the two-year TOT for the shallow aquifer, underground storage tanks present the greatest incidents of occurrence. Hazardous materials have the second most frequent number of incidents, followed by leaking underground storage tanks and historic underground storage tanks. HAZMAT incidents and environmental cleanup incidents are also present. In the five-year TOT, underground storage tanks have the highest number of incidents followed by hazardous materials, HAZMAT incidents, and historic underground storage tanks. The ten-year TOT indicates no recorded incidents of potential risks.

Figure 4: Shallow Well, State Data Base Inventory Summary

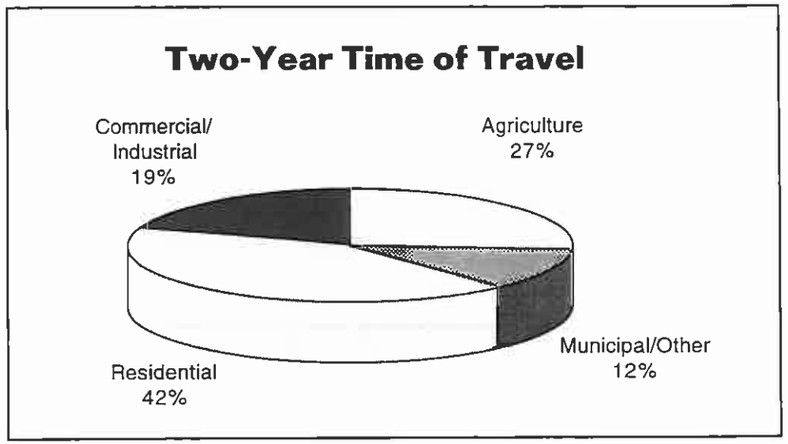


Deeper Aquifer Wells

Within Two-Year Time of Travel

In the delineated zone for these wells, the area within the two-year TOT has the most risks associated with it both in terms of commercial/industrial businesses and other contamination sources. This region has a mix of commercial/industrial, residential, municipal, and some agricultural land uses.

Figure 5: Land Use, Deeper Aquifer Two-Year Time of Travel Zone



- **Industrial/Commercial Businesses**
  High risk — 13
  Medium risk — 20

- **Total Residences** — 954

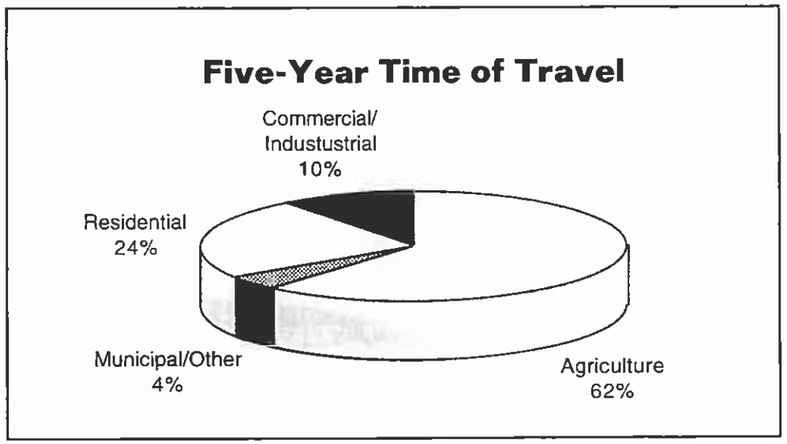
- **Rural Residences** — 21
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

- **Other Contamination Sources**
  Leaking underground storage tank — 3
  Environmental cleanup (DEQ) — 1
  Historic underground storage tank/gas station — 6
  Underground storage tank (DEQ) — 11
  Hazardous materials (Fire Marshall) — 8
  HAZMAT incident (State Fire Marshall) — 4

Within Five-Year Time of Travel

Commercial/industrial businesses and other contamination sources pose risks in this area. Almost two-thirds of the region is in agricultural uses, while the rest is in residential, commercial/industrial, and municipal land uses.

Figure 6: Land Use, Deeper Aquifer Five-Year Time of Travel Zone



- **Industrial/Commercial Businesses**
  High risk — 9
  Medium risk — 9

- **Total Residences** — 633

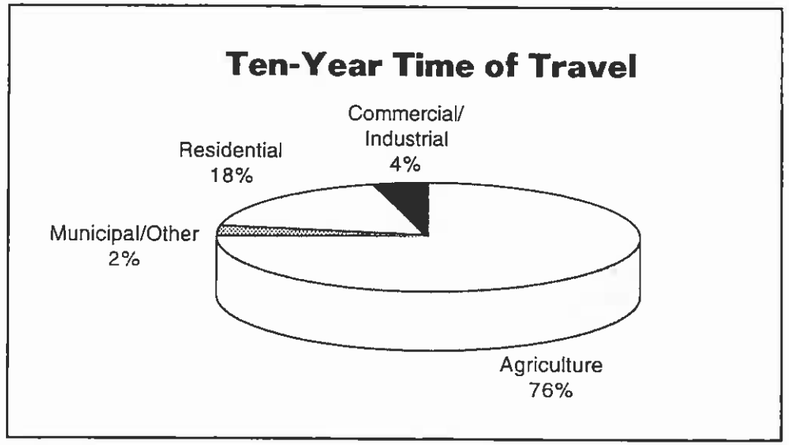
- **Rural Residences** — 21
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

- **Other Contamination Sources**
  Leaking underground storage tank — 5
  Environmental cleanup (DEQ) — 1
  Historic underground storage tank/gas station — 0
  Underground storage tank (DEQ) — 6
  Hazardous materials (Fire Marshall) — 4
  HAZMAT incident (State Fire Marshall) — 1

Within Ten-Year Time of Travel

There is some risk associated with commercial/industrial businesses, as well as other contamination sources. A high number of rural residences and irrigated fields in this region also have potential risks associated with them. Agricultural land uses dominate this region comprising about three-fourths of the area, with about one-fourth in residential, commercial/industrial, and municipal uses.

Figure 7: Land Use, Deeper Aquifer Ten-Year Time of Travel Zone



- **Industrial/Commercial Businesses**
  High risk — 2
  Medium risk — 5

- **Total Residences** — 523

- **Rural Residences** — 88
  (Pesticide/fertilizer storage, mixing, and application; machinery repair: fuel storage)

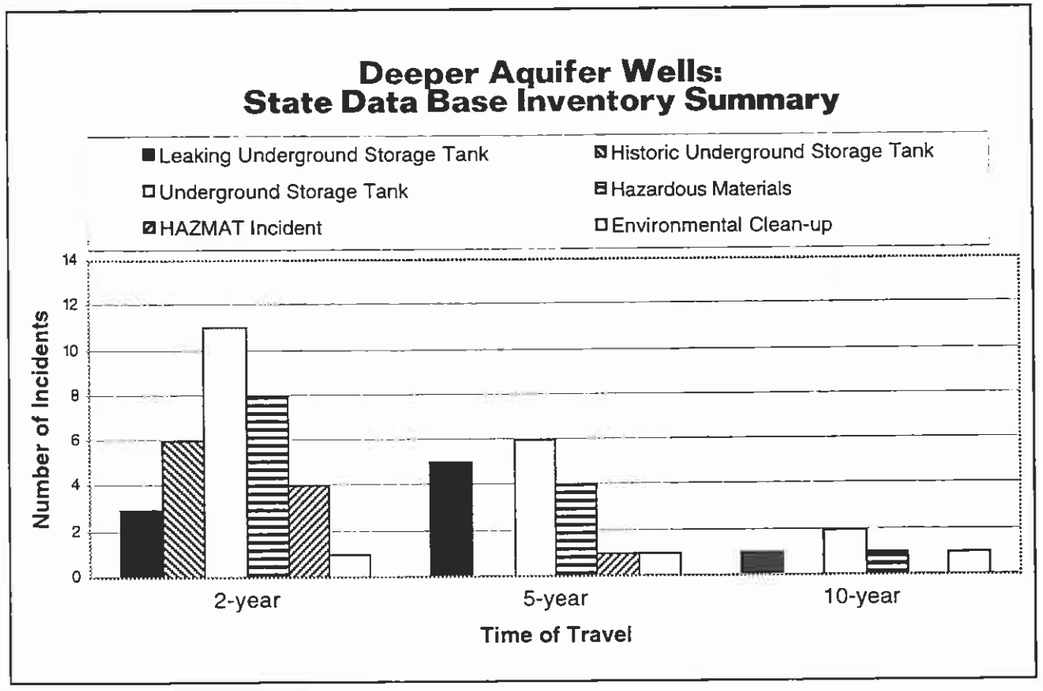
- **Other Contamination Sources**
  Leaking underground storage tank — 1
  Environmental cleanup (DEQ) — 1
  Historic underground storage tank/gas station — 0
  Underground storage tank (DEQ) — 2
  Hazardous materials (Fire Marshall) — 1

State Data Base Inventory

The State Data Base Inventory Summary (Figure 8), indicates that in the two-year TOT for the deep aquifer, underground storage tanks have the greatest incidents of occurrence. Hazardous materials have the second most frequent occurrences followed by historic underground storage tanks. HAZMAT incidents, leaking underground storage tanks and environmental cleanup incidents are also present. In the five-year TOT zone, underground storage tanks have the most incidents of occurrence, followed by leaking underground storage tanks, hazardous materials, HAZMAT, and environmental cleanup. In the ten-year TOT, underground storage tanks are the most frequently recorded threat to groundwater. A HAZMAT incident, hazardous materials and leaking underground storage tanks are also present in this zone.

Completion of the inventory provided the Committee with the basis to develop management strategies to address potential risks to groundwater contamination that were identified in the inventory process. Management of potential sources of contaminants is presented in the following chapter.

Figure 8: Deep Aquifer Well, State Data Base Inventory Summary



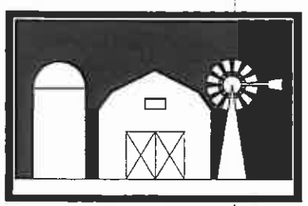
Chapter 5

Management of Potential Sources of Contamination

Management of Potential Sources of Contamination

This chapter is divided into the four primary land use categories in Junction City's drinking water protection area: agriculture, industrial/commercial, residential, and municipal and other community-based uses. Within each category, potential sources of contamination are first identified and then addressed by formulating goals and related management strategies. Goals are broad vision statements describing desired conditions or activities in the future. They provide direction for the development of management strategies. The management strategies for each goal more specifically describe a course of action. Each goal and related cluster of management strategies includes a background discussion providing the rationale for the goals and management strategies identified for each land use category.

The implementation of management strategies is key to the ultimate success of the Plan. Upon the adoption of the Plan, the City Council will appoint a standing Drinking Water Protection Committee (Ongoing Committee). This committee will include, but is not limited to, a representative from each of the four subcommittees, and will meet at least twice a year. In addition, the four subcommittees will continue meeting at least twice a year to monitor and follow up on implementation activities.



Agriculture

Farmers in Junction City have been working the land for years. Guarding the health of the land and water is important for the continued success of the farming operation because quality land and water are what the farming community depends upon for its success. Most farmers are striving to do the best they can to protect themselves and others from problems. Through voluntary and mandated efforts, farmers are applying many best management practices because they too rely on groundwater for their drinking water. The agriculture section of this management plan reminds agricultural land users to apply measures that protect the underground water supply. Agricultural land users include large-scale farming operators and several smaller scale growers and rural residential use.

The agriculture sub-committee identified seven priority groundwater risk issues related to agriculture and rural land use. These potential threats are listed below in priority order from high to lower priority:

1. Improperly constructed, maintained, or abandoned wells;

2. Chemical handling and mixing;
   - Fertilizer and pesticide mixing and handling near wells, and
   - Spills.

3. Chemical applications (fertilizers and pesticides);

4. Equipment repair facilities (risks associated with cleaning solvents and used substances);
5. Fuel storage;
    - Underground fuel tanks: biggest risk, and
    - Above-ground fuel storage leaking and potential spills.

6. Small farms; and

7. Organic substances problems
    - Organic farming nitrate and waste disposal problems, and
    - Small-scale livestock operations.

Four goals integrate these areas of concern and are addressed by management strategies designed to reduce the risks associated with farming operations and rural land use. Following is an overview of the inventory as it relates to agricultural uses and the four goals and related management strategies recommended.

Agriculture Inventory Summary

Agriculture land use comprises about 68 percent of the groundwater protection area (out to and including the ten-year TOT) in the delineated area of the shallow aquifer. In the deeper aquifer, agricultural land use comprises about half of the delineated area. The majority of agricultural activity is conducted by eight large operation growers and several small farm operators within the drinking water protection areas. In addition, there are about 130 rural home owners who do not have a farming operation per se, but who could still pose similar threats to the groundwater resource in regards to the identified priority issues of concern. Grass seed, vegetables, mint, and a few small orchards are the primary crops grown within the groundwater protection area. Roughly 25 percent of the area in crops requires irrigation, considered to be a medium risk according to the Guidance Manual. About 75 percent of the crop area is currently not irrigated (or minimally irrigated) placing this area in the low-risk category. However, it should be remembered that crop rotations are a normal farming practice and what is grown on a site one year may very well change in following years. This means that irrigated land one year may be non-irrigated the next year and vice versa.

Goals and Related Management Strategies

Goal 1: Establish a well health education program informing people about proper well construction, maintenance, and abandonment.

1. Produce a two-page fact sheet providing information on proper well construction, maintenance, and abandonment including:

- Diagram of a properly sealed well,
- Legal basis for properly constructing and abandoning wells,
- Types of well abandonment (temporary and permanent),
- Periodic well inspection basics,
- Water testing procedures and contacts,
- List of resources for further information,
- The use of backflow devices, and
- Encourage voluntary home assessment using Home-A-Syst.

  ❑ Request Oregon State University (OSU) Extension assistance in fact sheet formation and distribution.

2. Establish a cost share or grant program to help property owners properly abandon wells that are no longer in use.

   ❑ Apply for grant funding, possibly through the Environmental Quality Incentives Program (EQIP).

3. Work with Lane County Extension Service to make voluntary site visits to help property owners determine potential risks

4. Distribute Home-A-Syst information pamphlet that describes the assessment system and to inform property owners of how to order the Home-A-Syst assessment packet.

   ❑ Junction City will mail the pamphlet that was developed by the OSU Extension Service.

   ❑ Agricultural sub-committee will request that OSU Extension Service Home-A-Syst program focus marketing efforts in the groundwater protection area.

Background Discussion

Well health depends upon the adequate and appropriate construction, maintenance, and eventual abandonment of the well. Improperly constructed, maintained, or abandoned wells can provide a direct conduit for contaminants to reach the aquifer and pose a liability to property owners. The purpose of this goal is to inform well owners about the importance of *well health* and to know what procedures are necessary and the technical resources that are available for the care of wells. Oregon law requires the proper abandonment of wells. By establishing a cost sharing program to help property owners properly abandon their wells, property owners will be encouraged to identify and properly abandon their wells.

Backflow prevention valves are also an important part of preventing well water contamination. While filling chemical application tanks, fluid can be

drawn back down into the well if the faucet does not have a backflow prevention valve. Although backflow prevention devices are required for chemigation equipment, chemical application equipment is often filled from faucets that do not have backflow prevention valves. By providing information to the property owners, citizens will be better educated about the hazards of filling chemical tanks from a faucet without backflow devices and will be encouraged to purchase backflow devices for faucets used.

The OSU Extension Service developed a homestead assessment system called Home-A-Syst. This program provides an assessment tool for rural residents to use in performing a self evaluation of potential groundwater risks associated with their residence. The assessment package consists of 11 worksheets that help assess management practices that can affect drinking water and nine fact sheets that suggest how to change high-risk practices and where to go for more information. Although Home-A-Syst is an effective assessment and educational tool, property owners can be reluctant to use it because it is often perceived to be too time consuming. Much of the information in the fact sheets to be developed and distributed in relationship to this goal and the other three goals will be taken from the Home-A-Syst packet. The idea is to initiate awareness and interest with brief information sheets; the longer range goal is to have property owners conduct a more thorough homestead evaluation using the Home-A-Syst packet. The fact sheets will encourage rural home owners to acquire a Home-A-Syst packet. In addition, an existing promotional brochure about Home-A-Syst will further encourage rural residents to conduct a thorough groundwater risk assessment.

Goal 2: Inform small farm operators and remind large growers about proper chemical handling, storage, and application.

1. Produce a fact sheet that provides information regarding *groundwater friendly* chemical use, including:

    - Keeping chemicals away from wells,
    - Following the label (do not overuse),
    - Encouraging backflow devices,
    - How to deal with small spills,
    - Non-toxic alternatives to traditionally used chemicals, and
    - Encouraging voluntary home assessment using Home-A-Syst.

        ❑ Request OSU Extension assistance in fact sheet formation and distribution.

2. Provide information at growers' meetings and pesticide applicator short courses about chemical use and its association with groundwater contamination risks. Information can be provided through written material and/or speaker presentations and should include information presented in Strategy 1 and:

- Application and irrigation practices that reduce nitrate use for specific crops (vegetables, mint, grass seed, etc.),

- Best management practices that reduce the amount of nitrate and/or pesticide leaching (cover cropping, soil analysis, etc.).

  - ❑ Contact OSU Extension Service and request inclusion of groundwater-related educational sessions in pesticide applicator short courses within Lane County.

  - ❑ Contact Farmers Co-ops and request inclusion of groundwater-related discussions at growers meetings.

  - ❑ If funding allows, LCOG will prepare a fact sheet on groundwater-friendly chemical mixing, storage, and application.

3. Sponsor a hazardous materials round-up that will allow the collection of surplus agriculture chemicals.

   - ❑ Research the possibility of coordinating activities with Lane County Solid Waste Disposal Program.

   - ❑ Initial contact with Rick Volpel and Bob Borrows, DEQ, was made to initiate a round-up process and event.

   - ❑ Apply for a DEQ solid waste grant to develop a hazardous materials collection/recycling program.

4. Encourage the installation and monitoring of passive capillary sampling (PCAPS) stations on additional farms within the wellhead protection area.

   - ❑ Contact John Selker at OSU Extension Service to determine feasibility of expanding research conducted in the Junction City area. (LCOG and OHD will initiate.)

   - ❑ Apply for Resource Conservation and Development Program grants for partial funding of PCAP installation and monitoring.

5. Work with farmers to apply best management practices that reduce nitrate leaching.

   - ❑ Natural Resource Conservation Service and Lane County OSU Extension Service are currently applying for EQIP funding for best management practice projects in the area.

6. Work with Lane County Extension Service to make voluntary site visits to help property owners determine potential risks.

7. Distribute Home-A-Syst information pamphlet that describes the assessment system and to inform property owners of how to order the Home-A-Syst assessment packet.

    - ❑ Junction City will mail the pamphlet that was developed by the OSU Extension Service or request that OSU Extension Service focus marketing efforts in the drinking water protection area.

Background Discussion

Working with the land is the farmer's livelihood. In most cases, best management practices that protect drinking water are being applied because they help prevent problems to others and make good business sense. Fertilizer and pesticide applications are typical farming practices in order for the farmer to get the best yield on the crop planted. Pesticides include herbicides, insecticides, rodenticides, fungicides, and avicides. The EPA has registered approximately 50,000 different pesticide products for use in the United States. Many are highly toxic and mobile in the subsurface. Large-scale pesticide applicators (farmers and professional applicators) have to be licensed and undergo periodic training to help ensure the safe application and storage of chemicals. These applicators will benefit from educational reminders about the risks of chemical use to potential groundwater contamination. Smaller property owners (who do not necessarily have a license or training) will benefit from factual information about how to safely handle, store, and apply chemicals to reduce the risk to the drinking water resource.

The use of practices that minimize leaching are preferred by growers because they reduce the amount of chemicals used, thus reducing costs and increasing profit margins. Leaching refers to the movement of a substance (fertilizer, pesticides, etc.) down through the soil and potentially into the aquifer, which is the source of drinking water. Water, either through rain or irrigation, is the primary force driving the movement of these substances through the soil. The extent of leaching varies with different substances, but in general is controlled by many factors. Some of these factors are the amount and timing of substance application, and the amount and timing of water applied after application. In addition, best management practices, such as the use of cover crops or integrated pest management techniques can also reduce leaching. The management strategies for this goal provide information to farmers that will help them determine appropriate applications of chemicals and irrigation practices that will minimize leaching.

Currently, a program associated with the OSU Extension Service is conducting research to measure the amount of leaching of fertilizers and pesticides from irrigated crops. Using lysimeters, called PCAPS, researchers can tell how much of a substance is leached after different farming practices. Results from these measurements are helping farmers to adjust

product applications to reduce leaching, resulting in the maximum use of products and protecting the groundwater. Expansion of this program onto other farm sites within the drinking water protection area and a sharing of results will strengthen the level of groundwater protection, especially regarding nitrate leaching.

Chemical storage and handling near the well are also concerns for both large-scale growers and rural residential owners with fewer acres. Well houses can appear to be the perfect, convenient place for storage of chemicals if the property owner is unaware of the potential risks associated with such storage. Property owners need to be informed and reminded that chemicals should not be stored or mixed near the well. Removing chemicals from this location will reduce the risk associated with potential spills of concentrated substances. Chemicals that are no longer being used should also be disposed of properly. Currently, chemical containers (emptied and rinsed) can be disposed of twice a year at an event sponsored by the Oregon Agriculture Chemical Association. This Plan includes a strategy to have at least one more annual event that allows small- and large-scale farm operators to dispose of surplus chemicals.

The EQIP was recently established under the 1996 Farm Bill. The program is designed to provide technical, financial, and educational assistance to farmers to address significant natural resource concerns and objectives in priority areas. With the delineation of the Junction City drinking water protection areas, Junction City defined a priority area of concern for potential EQIP funding to be directed to places with critical environmental needs.

Goal 3: Reduce risks to groundwater associated with equipment repair facilities and fuel storage.

1. Produce and distribute a fact sheet providing information about:

    - Proper use, storage, and disposal of cleaning solvents and other vehicle repair and maintenance supplies;
    - Environmentally friendly alternatives to traditional cleaning solvents;
    - Recycling resources for cleaning solvents and used equipment fluids (oil, anti-freeze, etc.), including a list of suppliers that recycle or dispose of solvents;
    - Oregon laws and liabilities associated with underground fuel storage tanks;
    - How to avoid above ground tank leaking and spills; and
    - Where to locate an above-ground storage tank from a groundwater contamination risk perspective.

        ❑ Information to include in fact sheet was identified. LCOG will either formulate the information into a fact sheet or OSU Extension will be requested to assist in preparation and distribution.

2. Distribute Home-A-Syst information pamphlet that describes the assessment system and to inform property owners of how to order the Home-A-Syst assessment packet.

    - ❑ Junction City will mail the pamphlet that was developed by the OSU Extension Service or request that the OSU Extension Service Home-A-Syst program focus marketing efforts in the drinking water protection area.

Background Discussion

Many farming operations include an on-site equipment repair and maintenance shop. These facilities can contain potential groundwater contaminants such as: solvents; metals; oily metal shavings; lubricant and cutting oils; degreasers (tetrachloroethylene); and metal marking fluids. The purpose of this goal and related management strategy is to help ensure that these substances do not contaminate the aquifer. Owners and managers of these repair and maintenance facilities need to be aware of potential risks of commonly used substances and best management practices that minimize these risks. One of the biggest barriers for the property owner is being able to properly dispose of and/or recycle used substances. By encouraging recycling practices and developing a recycling resource list, property owners will be better informed as to how to dispose of used substances safely.

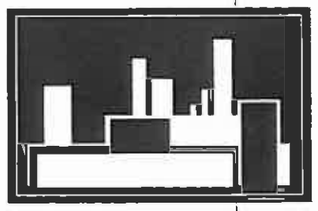
Many rural home owners and/or farm operators have either underground or above-ground fuel storage tanks for heating or vehicle fuel purposes. Fuel storage, in both underground and above-ground tanks pose risks to groundwater if leaking occurs. Oregon law requires the proper siting and construction of both types of storage units. Because underground fuel tanks are more likely to develop leaks, the leaks are more difficult to detect, and contamination is more difficult to clean up. By educating property owners about the risks and liabilities associated with fuel storage, they will be encouraged to properly abandon underground storage tanks and properly install above-ground tanks.

Goal 4: Educate small farm operators, organic farmers, and rural residents about groundwater contamination risks and best management practices to reduce those risks.

1. Produce and distribute a fact sheet providing information regarding:

    - Nitrate problems associated with organic waste and manure piles,
    - Review of hazards associated with chemicals commonly used in organic farming,
    - Small-scale livestock operation risks,
    - Best management practices that reduce risks of groundwater contamination from organic substances, and

This goal also focuses on the 130-150 rural residents (2- to 15-acre lots) in the groundwater protection area who together may pose a greater risk than larger scale farming operations. Although the quantities of chemicals used and stored by rural residents are often lower than a farming operation, rural residents are usually not trained or licensed in safe and appropriate chemical use. Many rural residents also have a few livestock which, as discussed, have potential risks to groundwater. Providing an array of information about potential threats and practices to minimize those threats will help rural residential property owners take action to help ensure adequate protection.



Commercial/ Industrial

Commercial and industrial facilities are among the most highly regulated of any land uses through laws such as the Toxic Substances Control Act (TSCA) and the Resource Conservation and Recovery Act (RCRA). Despite this level of regulation, commercial and industrial facilities can still pose a risk to groundwater. The majority of the regulations applicable to commercial and industrial facilities rely on responses to contamination events, rather than on preventing problems in the first place. Furthermore, businesses often are not aware of the connection between these regulations and the potential for contamination of groundwater and drinking water.

Junction City's commercial and industrial goals and management strategies focus on pollution prevention and on raising awareness of the relation between businesses' actions and drinking water contamination. The Commercial/Industrial Subcommittee chose these goals and strategies as having the potential to be the most effective in Junction City's business community while minimizing strategies that would add additional regulations to businesses. This decision was based on the recognition that businesses are already heavily regulated and it is common for a business to be unaware of all existing regulations, as well as new regulations. It is more effective to highlight and generate greater awareness of existing regulations and educate businesses on the importance of protecting the groundwater. Groundwater is the drinking water supply for the entire community and it supplies the water used by these very businesses.

Business liability for contamination is another point that will be stressed in Junction City's outreach. As a way of encouraging contamination prevention, businesses will receive information on resources available to them from either private companies or insurance providers. Businesses are more receptive to assistance from these sources rather than assistance offered by the enforcing agency.

Following is an overview of industrial/commercial land use within the drinking water protection area and management strategies that address issues related to these land uses.

Inventory Summary

The inventory process, described in greater detail in Chapter Four, identified a relatively high level of risk from commercial and industrial activities in the two- and five-year TOT zones for Junction City's wells. There is a high concentration of commercial and industrial uses that are considered to pose a moderate to high risk to area groundwater. The siting of these facilities took place in response to the location of the railroad, zoning regulations, and other historical factors.

The two-year TOT has the highest concentration of industrial and commercial uses. There are 11 high-risk and 17 medium-risk industrial/commercial uses in this delineated zone for the well that draws from the shallow aquifer. The shallow unconfined aquifer is more susceptible to contamination than the deeper and confined aquifers. For the wells that draw from the deeper aquifer, there are 13 high-risk and 20 medium-risk industrial/commercial uses in the two-year TOT.

Within the five-year TOT zone there are eight high-risk and nine medium-risk industrial/commercial uses for the shallow well; and nine high- and nine medium-risk industrial/commercial uses for the deeper wells.

The fewest number of high- and medium-risk industrial/commercial uses exists in the ten-year TOT zones for both the shallow and deep wells. There are only two high- and five medium-risk uses within both of these zones.

Goals and Related Management Strategies

The goals for the industrial/commercial community focus on pollution prevention and raising awareness of the connection between businesses' actions and drinking water contamination. These goals will be targeted primarily to industries and commercial businesses considered to have a medium or high risk of contamination associated with them.

Goal 1: Educate business and industry about the vulnerability of groundwater, what they can do to protect the groundwater, and resources available to them.

1. Send a letter and information flyer to medium- and high-risk businesses located in the ten-year TOT. Identify businesses located in the shallow-well capture zone and include information to make them aware of the corresponding increased risk. Include:

- Hazardous waste collection opportunities (Lane County; private companies);
- Importance of emergency plans, importance of reviewing and updating plans;
- Who to call in the event of a spill;
- Contaminant threat from stormwater runoff and how to reduce the threat; and
- Information on resources available for pollution prevention.

  ❑ Ongoing Commercial/Industrial Subcommittee will identify mailing addresses of medium- and high-risk businesses located in the ten-year TOT zone and separate out those in shallow well zone.

  ❑ Subcommittee will a draft letter and information flyer to send to these businesses (see Appendix F for preliminary draft).

2. Raise groundwater awareness through supporting residential management strategies that call for stenciling storm drains and erecting signs to identify the drinking water protection area.

   ❑ Ongoing Subcommittee to coordinate with Public Works Department and Catch-All Subcommittee to use stencil on storm drains at businesses.

   ❑ Encourage businesses to donate sign or stencil materials to implement this strategy.

Background Discussion

The purpose of this goal is to reduce the risk of groundwater contamination by businesses in the drinking water protection area by educating and assisting businesses in developing groundwater protection strategies that supplement the regulatory structure. The main vehicle of this education will be a letter and supplementary information sheet sent to all businesses within the ten-year TOT that are considered to pose a moderate or high risk to the groundwater resource. In addition to informing businesses of the drinking water protection effort, the letter will provide information on technical assistance available at the local, state, and federal levels. In particular, the Drinking Water Protection Committee encourages businesses to take advantage of DEQ's Pollution Prevention Program. Education and technical assistance can help the business owners explore alternatives that might not otherwise be considered.

Management strategies aimed at raising awareness of the groundwater resource that are included in the residential section of this Plan will reinforce education efforts directed towards business owners. Awareness will be raised among business owners by encouraging them to donate a sign to identify the drinking water protection area and paint the stencil on their

storm drains. Education also is incorporated in two of the management strategies listed under Goal 2 of this section. The strategy that requires submittal of a Hazardous Communication Plan at the time of building permit application for medium- and high-risk businesses will provide an opportunity to open the dialog about the vulnerability of groundwater and about technical assistance available. Annual visits by the Junction City Fire Department to review Oregon's Hazardous Substance Survey will offer another opportunity to educate businesses on best management practices. These visits are an anticipated strategy of Junction City's Emergency Response Plan, scheduled for development in fall 1997.

Goal 2: Encourage safe storage and handling of hazardous materials.

1. Develop a more user-friendly drinking water protection area that incorporates the entire ten-year TOT.

    - ❑ Develop a map of a simplified drinking water protection area based on existing roads as follows: the area bounded by River Road/Love Lake Road to the east; Link Lane to the north; Dorsey Lane to the west, and Milliron Road to the south. Where roads do not extend the entire length of the area, extend the boundaries along a straight line from the road to form a rectangle (see Appendix G).

    - ❑ Identify corresponding township, range, sections to encompass this area for purposes of identifying locations inside the protection area when reviewing building permit applications (see Appendix G).

2. Establish a mechanism for medium- and high-risk businesses located within the 10-year TOT to submit their Hazardous Communication Plan with their building permit application. Hazardous Communication Plans are an existing requirement of the Occupational Safety and Health Administration (OSHA).

    - ❑ The Ongoing Commercial/Industrial Subcommittee will determine a mechanism for identifying medium- and high-risk businesses, possibly using Standard Industrial Codes (SICs) that correspond to medium- and high-risk businesses. Start with the Standard Industrial Codes (SICs) that the State Fire Marshal uses to identify industries that need Hazardous Material Reports.

    - ❑ In the city, pass an ordinance requiring medium- and high-risk businesses to submit their Hazardous Communication Plans with building permit applications.

- ❑ Coordinate with Lane County to have medium- and high-risk businesses in the drinking water protection area submit their Hazardous Communication Plan to Junction City at the time of building permit application. For the purposes of this coordination with Lane County, the drinking water protection area will be defined as the township; range; and sections identified in Strategy 1, above; and the southern part of Junction City's urban growth boundary that extends south of this simplified drinking water protection area.

3. The Public Works Director will provide those applicants required to submit a Hazardous Communication Plan with information on pollution prevention resources available to them. This will be a mechanism to start a dialog with the business about the drinking water protection area and ways to prevent groundwater pollution.

4. Coordinate with development of Junction City's Emergency Response Plan to initiate annual visits to medium- and high-risk businesses by the Junction City Fire Department to discuss safe storage and handling of hazardous materials and to verify locations/quantities of hazardous materials. This would also encourage businesses to be accurate in filling out required forms and would provide an opportunity for distribution of basic educational information.

    - ❑ Members of the Commercial/Industrial Subcommittee will meet with the Fire Department and the committee developing a city-wide Emergency Response Plan to integrate this strategy. *(The Fire Department agreed to assist with this. Development of Emergency Response Plan is scheduled to start fall 1997).*

    - ❑ Ongoing Commercial/Industrial Subcommittee will provide the Fire Department with information sheets on groundwater protection to distribute to businesses when they visit. *(Groundwater Basics information sheet provided late spring 1997; the Fire Department agreed to assist with this).*

Background Discussion

The purpose of this goal is to focus on proper storage and handling of hazardous materials by identifying and addressing potential and existing problems. This covers both new and existing businesses. This goal addresses potential contamination from new businesses by providing a mechanism to educate businesses about the potential for groundwater contamination. This strategy will be pursued both within the Junction City city limits and in the portions of Lane County identified by township, range, and section that encompass the simplified drinking water protection area. The number of building permits applied for by medium- and high-risk businesses may be few in number, but the effectiveness of this contact can be multiplied by design improvements that minimize risk to the groundwater and by awareness raising that is passed along to the businesses' employees. Ongoing communication to raise this awareness will be provided

through implementation of the city's Emergency Response Plan. The Fire Department will address the potential for groundwater contamination during periodic visits to businesses made in connection with the Emergency Response Plan.

Goal 3: Encourage prompt identification and clean-up of contamination sites.

1. Send letter to DEQ encouraging the State to give priority to decommissioning leaky underground storage tanks, cleaning up other identified sites, reviewing permits, and enforcing other regulations in the drinking water protection area.

2. Request information from DEQ on the current status of clean-up efforts in Junction City.

   ❑ Following approval of the Plan by the City Council, Ongoing Commercial/Industrial Subcommittee will draft and send a letter to DEQ addressing Goal 3 management strategies.

Background Discussion

DEQ has a backlog of sites that need to be cleaned up and a backlog of permits to be reviewed. These backlogs include hazardous materials sites, leaking underground storage tanks, and stormwater discharge permits. Chapter Four contains more details on the distribution of cleanup sites. Junction City intends to request that priority in scheduling these cleanups and permit review be given to designated drinking water protection areas, with particular emphasis on the two-year TOT zone.

Goal 4: Promote proper hazardous waste disposal.

1. Encourage City to establish local hazardous waste disposal opportunities in which businesses are permitted to participate.

2. Provide information to businesses on how to dispose of hazardous waste through:
   - Collection opportunities,
   - Agency contacts,
   - Private businesses (to include all private businesses in the area), and
   - Insurance company or underwriter.

- ❑ Include this information in an information flyer to mail to businesses, distribute with permits, and distribute at the time of Fire Department visits.

Background Discussion

Proper disposal of hazardous waste can be a difficult and complicated process. Businesses report that they have been referred from person to person when seeking agency help regarding proper waste disposal. The purpose of this goal is to help businesses receive information on opportunities to dispose of hazardous waste and to promote new opportunities for disposal of hazardous waste. Many businesses are not aware that they are permitted to make use of Lane County's Hazardous Waste Disposal days on a limited basis for a fee. The letter sent to businesses will clarify this. Additionally, the Plan encourages the city to pursue establishment of a hazardous waste collection day that would also be open to businesses on a limited basis. The letter will include information on other disposal options, including agency contacts and area private companies that deal with hazardous waste disposal.

Goal 5: Generate awareness of stormwater best management practices that can be applied by individual businesses or Junction City Public Works Department.

1. Encourage Public Works Department to examine possible area-wide treatment systems such as: oil/water separators, filter strips, grassed swales, and sand filters.

   - ❑ LCOG will provide the Public Works Director with information.

2. Develop a fact sheet for businesses to provide information on stormwater treatment.

   - ❑ LCOG will develop a fact sheet about basic stormwater practices.

3. Request that the DEQ give priority to reviewing and monitoring permits of businesses in the drinking water protection area that are required to have stormwater discharge permits.

4. Consider investigating the possibility of developing a systems development charge and/or a stormwater system user fee to pay for water quality improvements in the stormwater conveyance system and educational components of this goal.

Background Discussion

In developed areas, land has been covered by streets, parking lots, and buildings (impervious surfaces) that prevent rain from being infiltrated into

the ground. As the runoff flows over these surfaces, it can pick up pollutants—chemicals, oil, grease, fertilizers, and herbicides—that have collected on the surface. Stormwater leaving these impervious surfaces can then discharge onto the ground or enter surface waters where pollutants can eventually percolate down to groundwater.

The Junction City commercial/industrial corridor contains significant impervious surface area. Stormwater runoff in this area is currently addressed by collecting the water running off of the impervious surface and directing it into constructed ditches or natural channels. Several of these channels flow in close proximity to several Junction City wells. Contaminants carried in the stormwater discharge could eventually infiltrate the aquifer with this type of system. Potential contamination risk could be reduced by helping to ensure that water leaving impervious surface areas and entering the ground or surface water does not contain pollutants.

Stormwater runoff can be managed on both an individual business and an area-wide basis and involves both businesses and Junction City Public Works Department. Businesses can reduce their individual stormwater impact by applying best management practices (BMPs) that reduce pollutants at the source to prevent pollution of stormwater runoff discharged from the site. Practices can also be used to divert runoff away from areas of exposure to pollutants, such as raw materials, intermediate products, or finished products. On an area-wide basis, BMPs could be used to direct polluted runoff to natural or other types of treatment. Encouraging businesses to apply source reduction practices as much as practicable is a priority because these practices reduce the amount of pollution generated at the site and prevent contaminants from being exposed to stormwater in the first place. Treating contaminated stormwater to remove pollutants before the runoff leaves the individual site or once it enters the stormwater conveyance system is the next option, although this may transfer the pollution problem from one place or medium to another because treatment will not be completely effective. Source reduction methods are also desirable because they are often less expensive than treatment methods.

Residential

People need to know that their groundwater is a valuable and vulnerable resource. They also need to know what they can do, or *not* do, to help protect this resource. Many people are unaware that some common activities, such as housecleaning or gardening, may involve toxic chemicals that could have serious impacts on groundwater quality if overused or improperly disposed. Very small amounts of certain contaminants can pollute an entire community's groundwater supply, as can the cumulative effect of numerous less toxic sources.

To help prevent groundwater contamination, community members need to be educated about how their actions can affect groundwater. Education can lead to understanding, and understanding can lead to behavioral changes that help reduce the risk of groundwater contamination. Furthermore, education about the value and vulnerability of Junction City's groundwater has the potential of providing far-reaching benefits as people bring this awareness to their current and future jobs in business, industry, and agriculture.

Following is an overview of residential land use within the drinking water protection area and management strategies that address issues related to residential land use.

Residential Inventory Summary

Residential land uses are prevalent throughout the drinking water protection area, particularly within the two-year and five-year TOT zones. There are approximately 1,415 dwellings within the ten-year drinking water protection area for the well that draws from the shallow aquifer. Of this total, 88 are rural residences. There are 2,110 residential dwellings, including 130 rural residences, within the ten-year drinking water protection area for the wells that draw from the deeper aquifer.

Goals and Related Management Strategies

The primary goals for the residential community, which are aimed at raising awareness of groundwater sensitivity, will be targeted to at least those residences located within the ten-year TOT. Where resources allow, outreach will be conducted to encompass a broader portion of the study area.

Goal 1: Increase awareness among community members about groundwater vulnerability, residence-based sources of contamination, and how to reduce the potential for contamination.

1. Develop a flyer with basic educational information on groundwater.

   - ❑ Flyer with basic educational information on groundwater was developed *(see Appendix B).*

2. Develop a household hazardous waste education program for the groundwater protection area.

   - Investigate information already produced such as the *Household Hazardous Waste Fact Sheet* (Appendix H of the *Oregon Wellhead Protection Program Guidance Manual*) and the *What is Household Hazardous Waste?* pamphlet from the Oregon Department of Environmental Quality to develop educational information on use, storage, and disposal of hazardous waste.

- ❑ LCOG will apply for DEQ Solid Waste Grant.

3. Pursue ways of distributing this and other educational information, including:

   - Ongoing Catch-All Subcommittee will work with civic groups to canvas the town passing out this information to all residences.

     - ❑ Flyer may be mailed if there is not enough interest from the civic groups to assist in physical distribution. Budget for mailing 2,000 flyers is approximately $850. *(Target distribution of basic educational flyer by November 1997).*

   - Catch-All Subcommittee will make the flyer and other information available at various places in and around Junction City (e.g., the city library, local Chamber of Commerce, banks, doctor's offices and clinics, restaurants).

     - ❑ Initial distribution of flyers completed.

   - Ongoing Catch-All Subcommittee will work with schools to develop age-appropriate curriculum for schools, grade school through high school, making use of resources available through the OHD, DEQ, ODA, and Lane County Extension Service.

4. Catch-All Subcommittee will develop and maintain a list of groundwater protection tips to be inserted in monthly city water/sewer/garbage bills on an ongoing basis beginning with the April 1997 billing and to be submitted to local newspapers.

   - ❑ Initial list of tips included as Appendix C.

   - ❑ Tips published in the *Tri-County News* issue of 6/4/97 and the 04/16/97 Junction City High School *Maroon and Gold.*

5. Catch-All Subcommittee will work with the Public Works Department to institute a storm drain stenciling program.

   - ❑ Investigate acquiring a storm drain stencil; possibly one that includes reference to groundwater or drinking water.

   - ❑ Work with the Public Works Department, school classes, scouts and other civic groups to paint the stencil around town.

6. Erect signs to inform people that they are entering a groundwater protection area.

   - ❑ Ongoing Catch-All Subcommittee will work with commercial and industrial subcommittee to seek to finance purchase of these signs through civic groups, grants, or area businesses.

7. Ongoing Catch-All Subcommittee will investigate the types of septic systems that provide the best groundwater protection for the soil types in the Junction City Drinking Water Protection Area and will work with local civic groups to disseminate this information and resources on septic system upkeep and maintenance to residences that use septic systems in the drinking water protection area.

    - ❑ Contact DEQ groundwater program and request information on types of septic systems that are best for particular soil types.

    - ❑ Compile resources on septic system upkeep and maintenance.

Background Discussion

Threats to groundwater from residential land users primarily relate to the use, storage, and disposal of hazardous materials. Hazardous substances associated with residential use can come from household hazardous wastes, mechanical repair and maintenance products, land and garden care products, swimming pool maintenance chemicals, and stormwater runoff carrying pollutants such as petroleum, pesticides, fertilizers, etc. Improper storage and disposal of these types of products are a threat to groundwater.

The purpose of this goal is to increase awareness of the people who live and work in the Junction City area of the value of and threats to the groundwater resource. With increased awareness and knowledge of this resource, community members can personally take action to protect their groundwater resource. Outreach efforts will educate the community on:

- The vulnerability of Junction City's groundwater,
- How each citizen's actions can affect groundwater quality,
- Why it is important to reduce the cumulative effects of groundwater impacts,
- What could be the consequences of groundwater contamination,
- Tips on how each citizen can reduce the likelihood of contributing contaminants to the groundwater,
- Resources available to citizens, and
- What to do in the event of a spill.

Information distributed will also address use of non-toxic alternatives, safe use, disposal, and storage or toxic materials, and upkeep and maintenance of home heating oil tanks and septic systems. The availability of this information will empower people to reduce the risk that they pose to their drinking water source.

The density of septic systems can also have a strong influence on nitrate levels. Septic systems contribute to nitrate levels even though the drainfield allows effluent to percolate into the soil. Housing development greater than 1 or 2 units per acre that rely on septic systems can be of moderate to high risk because of the potential for elevated nitrate levels. Most of the residences located inside the city limits are connected to the city's sewer system. There is, however, a pocket of development inside the

city limits along southwest Laurel that is still on septic systems; it is already a policy of the city to require these residences to connect to the city's sewer system as their drainfields fail. All residences outside the city limits and inside the drinking water protection area are on septic systems. Several such areas, particularly to the south and west of Junction City, have developed at relatively high densities. In order to annex into the city, property currently served by a septic system must develop a plan to connect to the city's sewer system over a specified period of time. New septic systems require a permit from the DEQ. Lane County administers the permit process for most residential systems within the county as a contract agent of DEQ. Factors that are considered in granting the permit include the seasonal depth to the water table, soil characteristics, density, and required setbacks from waterways, wells, and other features.

Home heating oil tanks are another potential threat to the groundwater resource. Preventing tank spills and leaks is important because of how rapidly fuel oil can move through surface layers and into groundwater. Residential tanks are generally not regulated and it is therefore difficult to know how many there are in existence. Contamination can stem from leaks, repeated small spills as a result of over-filling, as well as improperly abandoned tanks.

Goal 2: Promote proper disposal of hazardous waste.

1. The Catch-All Subcommittee and City staff will promote existing hazardous waste round-up events.

    - ❑ Dates for Lane County's May 1997 hazardous waste round-up were published on the City water bill. Future events will also be published in this manner.

    - ❑ Contact local newspapers to get articles written about these events in advance of the event.

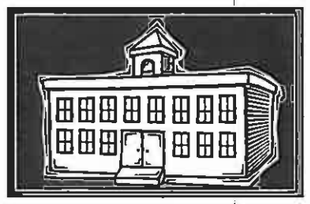
2. The Drinking Water Protection Committee will encourage the City to pursue options for establishing a periodic hazardous waste collection day in Junction City.

    - ❑ The Public Works Department has received information on contracting that the State DEQ does with private businesses to collect hazardous waste for municipalities.

    - ❑ The Ongoing Committee will work with City staff to apply for a grant to pursue this strategy.

Background Discussion

Proper disposal of household hazardous waste is a key strategy to reduce risks to Junction City's source of drinking water. The strategies in Goal 1 will work towards raising awareness of the need for proper disposal of these products, while Goal 2 will focus on providing opportunities to follow through on proper hazardous waste disposal. Current hazardous waste collection days that take place twice each year will be promoted through tips on water bills, distribution of flyers around town, and other means of spreading the word. A hazardous waste disposal opportunity that is more convenient to Junction City residents, however, would be more effective. It is a goal of this Plan for the City to establish such an event to increase the effectiveness of this prevention effort.



Municipal and Other Community-Based Uses

This use category includes government, church, school, and cemetery property and facilities. About three percent of the drinking water protection area is in this use. This type of land use can pose a potential risk to groundwater primarily from the storage, application, and disposal of hazardous materials. Two goals are the cornerstones of the municipal/other risk reduction approach. These goals and strategies focus on the Junction City Public Works Department being a model groundwater guardian agency and taking a lead role in generating awareness of groundwater issues among other municipal land use entities.

Municipal Inventory Summary

Municipal land uses include a combination of medium- and lower risk potential contamination sources. Medium-risk uses include city, county, and school grounds and maintenance facilities, because these locations usually store and use moderate quantities of hazardous materials, such as fuel, pesticides, and cleaning compounds. Churches are considered a slightly lower risk only because they tend to have a lesser amount of hazardous materials. Within the ten-year TOT there are four schools, two public maintenance facilities (one county and one city), a cemetery, and about ten churches.

Goal 1: Reduce the risk of groundwater contamination from chemical storage, handling, and application.

1. Establish City policy that Junction City employees are required to have an ODA pesticide applicator's license to handle, apply, and have access to pesticides. Request that other community establishments adopt the same policy.

    ❑ Pay for Junction City employee licenses and required associated certification credit training.

    ❑ Store chemicals in a separate locked area and restrict access to that area.

2. Investigate at least annually, chemicals (pesticides and cleaning products) that are less toxic and have a shorter residual time than those currently used and still providing the benefits desired.

    ❑ Contact Lane County Pubic -Works Department for suggestions.

    ❑ Contact Lane County Farmers Co-op for new product descriptions.

    ❑ Contact OSU Extension Service for product suggestions.

3. Remove the underground fuel storage tank at the Junction City Public Works Maintenance facility and replace it with a double-walled, fully contained, above-ground tank. Encourage other public facilities to do the same.

4. Sponsor an annual meeting of representatives from municipal land uses to increase awareness and discuss groundwater issues including:

    - Facility locations within the drinking water protection area,
    - Informative discussions and presentations on the risks associated with municipal uses,
    - The benefits of requiring licensed applicators, and
    - Exploration of ways to reduce groundwater contamination risks.

    ❑ The Junction City Public Works Director will coordinate the meeting.

5. Produce and distribute a fact sheet to provide information regarding groundwater-friendly chemical use including:

    - Keeping chemicals away from wells,
    - Following the label (do not overuse),
    - Encouraging backflow devices,
    - How to deal with small spills, and
    - Non-toxic alternatives to traditionally used chemicals.

    ❑ This strategy should be coordinated with the agricultural Strategy 1 of Goal 2.

Background Discussion

Storage, handling, application, and disposal of hazardous materials are the greatest risks to drinking water contamination from municipal uses. Park, school, church, and public facility grounds maintenance activities usually include the use of pesticides, primarily herbicides to control weeds. Several of these facilities also have on-site fuel storage for vehicle and equipment operations. Cleaning products used in the maintenance of public facilities also pose a potential risk to groundwater if handled inappropriately.

Government agencies (local, county, state, federal) are required by law to allow only licensed applicators to apply pesticides within their jurisdiction. Non-licensed employees are permitted to apply pesticides if supervised by a licensed applicator. This law however, is often unknown or overlooked, supervision is minimal, and access to chemicals is not restricted. Junction City Public Works Department will be a role model by establishing a City policy that only certified, licensed applicators be allowed to apply and have access to pesticides. The Public Works Department will also take a lead role in investigating new and/or different chemicals that have the desired pest control effects with the least environmental impact.

Junction City municipal government will exhibit model performance by removing the fuel storage tank located just a few hundred feet from two city wells. This tank's replacement with a double-walled, fully contained, above-ground tank will serve as an example to businesses and other public entities that reducing the risks to groundwater contamination are worth the costs.

This goal also aims to generate greater awareness of potential contamination sources and activities to prevent contamination among municipal land users. By holding an annual meeting with user representatives, this land use faction can learn about and discuss groundwater issues. This forum, including church and school representatives, will possibly also generate support, enthusiasm, and volunteer groups for community-wide activities.

Goal 2: Take proactive steps to be better prepared to respond to an emergency spill event within the drinking water protection area.

1. Inventory and become familiar with hazardous materials used and transported within the drinking water protection area.

   - ❑ Coordinate with Commercial/Industrial strategy implementation requesting hazardous materials information to be collected by the Junction City Fire Chief.

- ❑ Request chemicals transported list from railroad companies and periodically review (Review to be conducted by the Fire Chief, Public Works Director, and Police Chief).

2. Purchase and store additional absorbent materials for emergency spill situations.

   - ❑ Coordinate with community emergency response plan being developed.

Background Discussion

This goal relates to proactive strategies that will reduce the risk of groundwater contamination in an emergency spill situation. The contingency planning component of this Drinking Water Protection Plan (Chapter Six) is primarily a process of planning reactive measures to be applied in the event of a spill.

The center of the drinking water protection area contains Junction City's industrial corridor, a major highway, and two railway lines. A wide range of hazardous materials are located and transported within this area. Businesses handling specified quantities of hazardous materials are already required to identify and provide the State Fire Marshall with a list of hazardous substances on their property. These reports are also maintained at the Junction City Fire Department. In coordination with the business management strategy, the Fire Department will make annual visits to medium- and high-risk businesses to become more familiar with the types and locations of hazardous materials used. This knowledge will help the Fire Chief, Police Chief, and Public Works Director make better informed decisions in an emergency spill situation.

If a major spill should occur, the local jurisdictions' first priority is to ensure public and personnel safety and to contain the hazardous material. There are a variety of absorbent materials and products that assist in preventing a substance from moving laterally or vertically into the ground. Junction City Public Works Department has a limited supply of absorbent materials on hand and would be ill prepared for a large quantity spill. By supplementing the existing supply of spill response materials, an emergency situation will be more quickly, adequately, and appropriately addressed.

Chapter 6

Contingency Planning

Contingency Planning

The goals and management strategies of the drinking water protection plan focus on proactive efforts that will protect the drinking water supply. In a sense, the purpose of developing management strategies is to reduce the likelihood of ever having to use the contingency portion of the Drinking Water Protection Plan. However, in the event that a contamination problem should ever occur, Junction City needs to be prepared to deal with this emergency situation. The purpose of this Contingency Plan is to design a response to the contamination or disruption of Junction City's current water supply. This plan focuses on:

- The identification of the primary potential threats to the water supply and
- Developing procedures to be followed should the threats materialize.

Contingency Elements

Junction City's Contingency Plan addresses ten elements required by the Oregon Drinking Water Protection Program including:

1. Potential Threats to the Drinking Water Supply,
2. Protocols for Incident 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 Measures,
7. Plan Testing, Review, and Update,
8. Personnel Training,
9. Provisions for Public Education, and
10. Logistical and Financial Resources.

1. Potential Threats to the Drinking Water Supply

Primary threats to Junction City's drinking water system are related to an interruption of water delivery or contamination of the groundwater supply. The Contingency Sub-committee has identified the most likely types of events that could cause an interruption in delivery and/or contamination of the water supply, including:

A. Mechanical problems: power outage, broken main, pump failure;
B. Detection of a contaminant at the wellhead;
C. Contamination from leaking underground fuel storage tanks or injection wells;
D. Chemical spill at a local business facility;
E. Railroad or highway spills; and
F. Stormwater contamination resulting in well water contamination.

2. Protocols for Incident Response

This element details the appropriate response for the most likely potential threats listed in Element 1 above (A-F).

A - Mechanical-related interruptions:

- Rely on reservoir capacity of 1,350,000 gallons.
- Increase reservoir capacity.
- Apply conservation measures (see Element 6).

B - Detection of a contaminant at the wellhead:

Response to the detection of a contaminant at the wellhead depends on whether the substance reaches or exceeds the maximum contaminant level (MCL) measured during the monitoring process. The MCL is considered to be the maximum concentration that a contaminant can be in drinking water without posing a significant health risk. The OHD must be notified. If the contaminant is recorded as being at elevated levels yet still is below the MCL for that substance, then required quarterly monitoring should occur to track any changes in the contamination level of the well and determine that the contaminant remains below the MCL. If the confirmed concentration exceeds the MCL, the following procedures should be followed by Junction City local government:

- Shut down the contaminated well or wells.
- Determine if reservoir is contaminated.
- Implement curtailment or conservation plan if necessary.
- Identify local irrigation wells that may have to be shut down to reduce contaminant flow.
- Send news release to local media.
- Notify residents and businesses about conservation measures needed to be taken.
- Cooperate with agencies investigating the suspected contaminant.

C/D/E - Contamination from injection wells or leaking underground fuel storage tanks and railroad, facility, or roadway chemical spills:

Contamination from injection wells and leaking underground fuel storage tanks should primarily be addressed through proactive management strategies that reduce the likelihood of these threats. In the event of a contamination event from injection wells, underground tanks or a railway or roadway chemical spill, the following protocol applies:

Railroad, facility, or roadway chemical spill within the drinking water protection area:

Within the six-month TOT

- Refer to previously accomplished inventory of chemicals used and transported in the drinking water protection area and prepared related responses.

- Follow procedures for approaching area to minimize risk to personnel.
- Contact the Oregon Fire Marshal and CHEMTREC to determine what chemicals spilled and their characteristics.
- Contact 9-1-1 dispatch if appropriate response, related to contaminant type or quantity requires the Lane County HAZMAT Response Team.
- Follow communication procedures contained in Element 4 of this plan.
- Inform emergency responders that spill is within the drinking water protection area.
- Upon notification of spill, determine if it is necessary to shut down the shallow source well.
- Determine if chemical type and/or quantity dictates shutting down additional wells.
- Implement curtailment or conservation plan if necessary.
- Have absorbent and containment material on hand.
- Identify local irrigation wells whose pumping might affect the distribution of the contaminant.
- Send news release to local media.
- Notify residents and businesses about conservation measures needed to be taken.
- Leave cleanup to responsible party.
- If at a local facility, coordinate with facility's contingency plan.
- Coordinate with State agencies regarding community's extended role.

Within the two-year to ten-year TOT:

- Refer to previously accomplished inventory of chemicals used and transported in the drinking water protection area and prepared related responses.
- Follow procedures for approaching area to minimize risk to personnel.
- Contact the Oregon Fire Marshal and CHEMTREC to determine what chemicals spilled and their characteristics.
- Contact 9-1-1 dispatch if appropriate response related to contaminant type or quantity requires the Lane County HAZMAT Response Team.
- Determine if potential contamination threatens the 11th and Elm Street well (shallow aquifer) and shut down if appropriate.
- Follow communication procedures contained in Element 4 of this plan.
- Inform emergency responders that spill is within the drinking water protection area.
- Notify residents and businesses about conservation measures needed to be taken.
- Follow procedures for approaching area to minimize risk to personnel.
- Leave cleanup to responsible party.
- If at a local facility, coordinate with facility's contingency plan.
- Coordinate with State agencies regarding community's extended role.

F - Stormwater runoff-related contamination

Monitor outflows to receiving drainage channels, related to the incident, for contaminants such as diesel, motor oil, pesticides, and gasoline. In a fire or spill emergency, the fire and public works departments should take extra precautions to prevent contaminants from runoff.

3. Prioritization of Water Usage

This element prioritizes community needs in case the water supply is interrupted and/or a replacement supply is necessary. Junction City residents use about 2.1 million gallons of water a day during the summer months. Two above ground holding tanks in Junction City contain a maximum of 3.5 million gallons of water. Through a mock emergency exercise, the Committee prioritized the user groups who would be allowed to use a limited supply of water. Prioritization of water use from highest to lowest is as follows:

1. Fire Department,
2. Senior residential centers,
3. Other residential,
4. Industrial/Commercial
5. Schools,
6. RV parks
7. Other parks,
8. Car washing, gardens, lawns, and
9. Agriculture using city well water.

4. Key Personnel and Development of a Notification Roster

In the event of an emergency situation that threatens the water supply, key people must be notified and response procedures coordinated between city, county, and state personnel. A successful response also greatly depends on coordination and clear role definitions between local personnel from the Police, Fire, and Public Works Departments. The Junction City Police Chief, Fire Chief, and Director of Public Works have all been instrumental in developing and defining protocol for this contingency plan.

If a call is received by 9-1-1, the Fire District Chief or the Police Department is the first to be dispatched in the event of an emergency spill. The nature of the incident determines who is dispatched. If the incidence involves a vehicle accident, the Police Department is often the first to be notified. If the event is non-vehicle related and a spill reported, the Fire Department is normally the first to be notified by the 9-1-1 Dispatch Center. Both fire and police will be notified if a contaminant is known to be present. If the 9-1-1 call taker can determine the nature of the contaminant by information provided at the time, dispatch will determine whether the Lane County HAZMAT Team is the appropriate responder. However, the Dispatch Center often does not have adequate information to make this determination.

During an emergency spill event, an incident command center is established to adequately and safely control the situation. The incident command system is dynamic, meaning that as events unfold, roles and responsibilities of personnel may change as the situation progresses. The person in charge of the situation may also change depending on who responds first. For example, Police may be the first on the scene and in control of the

situation until the Fire Department personnel arrive. In general, the Junction City Fire Chief has overall responsibility and authority for a contamination event. If a spill occurs within the drinking water protection area, the Public Works Director should be notified as soon as possible. Police and Public Works personnel are responsible for aiding the Fire Chief in adequate, appropriate, and safe actions.

Key personnel and their roles are listed below:

Junction City Police
Police personnel are often the first to be dispatched and respond to an emergency event. Police are in charge of public safety until Fire District personnel arrive. Once the Fire Chief arrives at the scene, incident command control is relinquished to the Fire Chief. At the direction of the Fire Chief, the Police Department is responsible for keeping the area secured and providing support help.

Junction City Fire District Fire Chief (Dave Harlacher, 998-6337)
The District Fire Chief will be the person responsible for determining if local personnel can adequately and safely respond to a spill event. The Fire Chief will contact the Lane County HAZMAT Response Team if the situation and/or contaminant is beyond local equipment and personnel capabilities. If it is determined that a local response is adequate, the Fire Chief is the Incident Commander and determines and directs what is needed from police and other City personnel.

Junction City Public Works Director (Bob Fountain, 998-3125).
This person coordinates necessary actions, making any decisions regarding the operation of the water system. The Public Works Director provides technical assistance and any back-up support directed from the Incident Commander. It is this person's responsibility to inform the Incident Commander of the spills location within the drinking water protection area and suggest any additional precautionary measures that need to be considered. This person also works with the county to prepare a press release to Junction City residents. Having a general draft of a press release in place will expedite this. Other local officials will also be notified by the local coordinator or someone else designated by the local coordinator.

Lane County Sheriff's Office, Emergency Response Coordinator (Ike Jensen, 682-4160).
The Lane County Emergency Response Coordinator should be notified and will in turn inform the County Public Health Department and the Oregon Emergency Response System who in turn notifies other appropriate state agencies. Usually, the Fire Chief notifies the County Coordinator if the event requires county resources for response. However, if the County Coordinator is notified first, the Junction City Public Works Director will have a previously established arrangement with the County Coordinator to ensure that the City is notified when a spill emergency occurs within the groundwater protection area. The Public Works Director will also inform the County Coordinator of the location of the drinking water protection area.

Junction City Council President (Corky Wilde, 998-6722, work, and 998-3477, home).
The City Council President is responsible for notifying the Mayor and determining if a full City Council or subcommittee meeting should be called. The City Council will determine the level of water conservation measures to be taken if the water supply is reduced in an emergency.

Junction City Mayor (Steve Shear, 998-1117).

Public News Release Media Contacts (Bert Likens, 998-2153, work, and 998-8930, home).
The City Administrator will have a developed list of media contacts prior to an emergency situation to contact in the event of an emergency spill. The media will be informed of the nature of the event and any measures requested of citizens. Methods that will get the word out locally, without relying on Eugene media sources, need to be emphasized.

5. Short-Term and Long-Term Replacement of Water Supply

In the event of an emergency, the minimum water needs of the community must be met, and this supply must meet applicable health standards. Short-term options are those where the alternative supply is needed for a few hours or days. Long-term options are considered for a permanent alternative supply.

Potential short-term drinking water:
- Implement conservation practices.
- Bottled water
- Use irrigation wells after contacting OHD to determine safety.

Intermediate-term:
- Import water from neighboring sources following OHD recommended hauling procedures.
- National Guard tank trucks (fill at night during low use).
- Use some irrigation wells after contacting OHD to determine safety.
- Implement conservation practices.

Long-term:
- Develop additional storage facility.
- New well
- Develop a treatment facility.

6. Short-Term and Long-Term Conservation Measures

Conservation of water use will lessen demands on Junction City's public water system in the event of an emergency situation. This element identifies short- and long-term conservation practices that could be implemented as a function of user needs identified in Element 3, Prioritization of Water Usage. The extent of conservation measures necessary will depend upon the nature and extent of the emergency. Generalized conservation practices that can be applied across land uses are identified below, followed by specific measures that can be applied for the different user groups.

- Provide water for drinking purposes only.
- Administer fines to violators of water misuse or overuse in the event of a water shortage emergency (an ordinance needs to be in place for this action).
- Make water available for a limited duration each day.
- Drop the water pressure so that overuse is unlikely.
- Restrict car washing and lawn watering.
- Develop an odd/even day water usage plan.
- Review commercial/industrial use on a case-by-case basis to determine the amount of use and critical need.
- Encourage businesses to establish their own conservation/supply strategy prior to an emergency.
- Educate people about the emergency and necessary actions.

Junction City Parks: Parks will not be irrigated if a water usage reduction is necessary.

Agricultural Uses: Limitations can be placed on agricultural use of Junction City's wells or wells influencing water availability. The City should seek cooperation from owners of wells whose operation might effect water availability for Junction City. Agricultural wells in the general vicinity of the Junction City wells may also influence the flow of contamination by drawing water more quickly toward the city wells. A property owner may be liable if the use of their well contributes to the contamination problem of the community's water supply. These irrigation wells should be identified prior to an emergency and farmers should be notified in the event of an emergency, their use may be restricted and that their cooperation in reduced water use may be requested

Schools: Schools can reduce water use primarily by eliminating grounds irrigation. In a temporary emergency, tankers for drinking water and other essential functions should be stationed at the school facility to keep them in operation.

Industry/Commercial: Many businesses already have a contingency plan in place that identifies water conservation practices in the event of a water shortage. Businesses should be informed that in the event of an emergency, their water intake may be curtailed and that it is in their best interest to develop a conservation plan if they do not already have one. Businesses should also be encouraged to develop their own or a jointly shared water storage facility for water use in an emergency situation.

Resident: Common conservation measures for residential use include limiting practices such as, lawn and car washing, laundry use, and installing conservation devices such as low flow shower heads. The Oregon State Water Resources Department (OWRD) publishes a variety of informational pamphlets letting residential users know how to reduce water. With the assistance of OWRD, Junction City should identify procedures to limit water usage among residential users and educate residents prior to an emergency. These educational efforts are described in Element 9.

Fire Department: In the event of a fire during a water supply emergency, the fire department has top priority in water usage. The Junction City Fire District must be notified when a conservation program is going into effect and should identify alternative sources of water or fire response services to ensure fire protection.

7. Plan Testing, Review, and Update

This contingency plan's efficacy will be evaluated, reviewed, and updated using an annual review and mock exercise. The Public Works Director will review any personnel or situational changes and make adjustments to the Plan at least annually. The most effective way to test the Plan's ability to design an appropriate and adequate response is through a mock exercise. A simulated emergency will allow emergency responders to make necessary adjustments to the plan. Mock exercises will also serve as an educational tool for local citizens, reminding the community of the importance of protecting groundwater and the conservation measures that would be put into place in the event of an emergency situation. The Police Chief, District Fire Chief, and Public Works Director have all agreed to prepare and conduct a mock drill of an emergency spill event.

8. Personnel Training

To be effective, contingency plans must rely on properly trained people operating within a well-organized and effective system with up-to-date information. County and state emergency responders have been professionally trained to deal with HAZMAT responses. Local personnel should also be trained in initial HAZMAT response since they could be the first to arrive on site. Police officers receive basic HAZMAT response training as part of their officer training program. Currently all fire personnel also receive a first responders level of training. In addition, all 17 Fire Lieutenant Officers of the Fire District must have a higher level technician training for hazardous materials response. With this level of training, local personnel are able to adequately and appropriately identify and contain many hazardous materials. Training local personnel at the level of the Lane County HAZMAT Response Team and purchasing necessary protective gear is not cost effective for Junction City at this time.

10. Provisions for Public Education

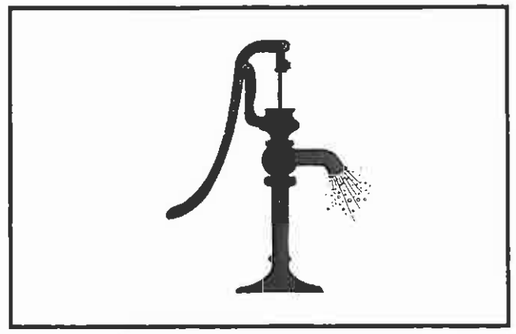
Educational materials build and maintain support for the Plan and can encourage assistance and understanding when contingency planning is put into effect. Management strategies for Junction City's Plan have a strong educational component that satisfies part of this contingency element. However, there are other educational components directly related to contingency planning that must be implemented to make the contingency elements effective emergency response tools. Before an emergency occurs, local residents and business owners must be knowledgeable about appropriate conservation measures that they will be expected to apply. Informational brochures on water conservation will be requested from the OWRD and distributed in advance of a water supply interruption or contamination.

11. Logistical and Financial Resources

Junction City should participate in an emergency response situation only to the extent of providing assistance and information regarding the water system and the particular needs of the community. The City should not attempt any clean up efforts on their own, although containment may be appropriate. The responsible party is legally obligated to report and clean up chemical releases. Appropriate cleanup measures will be dependent on the type and quantity of chemical released. The City may need to finance contamination cleanup and/or treatment if the responsible party is unknown or is the City itself. Potential funding sources include:

- Apply for State emergency funds.
- Increase City cash reserves to $2,000,000.
- Have a surcharge on water bills.
- Collect fines for violating water conservation standards.
- A bond measure for replacement, treatment, or cleanup needs.

Chapter 7



New Well Site Analysis

New Well Site Analysis

Junction City's growing population, industrial development, and probable service to a new prison site puts an increasing demand on the existing water supply. Although current capacity is sufficient, Junction City will soon need an additional well to meet the demands of growth. Evaluating potential sites from a groundwater risk perspective allows the City to select a site that has a relatively low-risk potential and develop proactive approaches by guiding existing and future land use activities that protect the area. This chapter provides an evaluation and analysis of a potential new well site for Junction City. Based on this evaluation, it is recommended that the City select a slightly different site, than is currently proposed, when the time comes to expand the drinking water supply.

Currently, one potential new well site has been identified that is intended to service the southern portion of Junction City and provide service to the proposed new prison site. The area is located near the intersection of Highway 99 and Culver Road. This site and its preliminary delineated groundwater protection area are shown in Map 3.

The proposed site is analyzed from a groundwater risk perspective although it is recognized that a variety of elements, such as distribution, productivity, and cost may also be considered for the ultimate selection of Junction City's next water supply. This analysis also considers other potential sites, demonstrating that by changing the proposed location, drinking water protection benefits or shortfalls may be realized. Selecting a preferred site from a groundwater risk view involves an analysis of various land use components such as property ownership and contamination risks associated with various land uses within that well's delineated protection area.

Selection Criteria

The proposed well site was analyzed using several criteria associated with land use. These criteria were determined by the New Well Subcommittee to be the most important factors influencing the choice of the most appropriate new well from a drinking water protection perspective. When it is time for the selection of a new well site, it is suggested that consideration be given to the site's contamination potential using the criteria listed below.

City ownership of wellhead property: City ownership (or possibility of purchase) of the property on which the well is located is considered a top priority for a new well. Having control over the immediate vicinity of the wellhead helps ensure protection of this most critical area.

Number of property owners: Protecting and managing a drinking water protection area generally becomes more complex with increasing numbers of property owners within the area. There is a greater chance that some of those property owners will not be supportive of a drinking water protection program and will increase the risk of contamination.

Cooperation of property owners: Cooperative landowners within the drinking water protection area help ensure that the area will be protected to the best ability of those property owners. Property owners who are opposed to a siting of the new well are less likely to voluntarily take extra precautions in protecting the area.

Risks associated with current land uses: Land uses vary in the type and degree of potential risk to groundwater. The higher the overall risk associated with differing land uses within the drinking water protection area, the less desirable that site is for selection of a new well location.

Risks associated with expected future land uses: Future land uses can influence the vulnerability of the drinking water protection area if future land uses are expected to pose a higher risk than existing land uses. General future land uses can be estimated by Plan Designations for the area and more specific development proposals are often known by local residents.

Analysis

Following is an analysis of the proposed well site related to the potential of groundwater contamination. The New Well/Contingency Plan Subcommittee also analyzed other locations within the general area of the proposed site to determine if another location might be more suitable based on selection criteria.

Although Junction City does not currently own the property of the proposed well site, willing sellers are expected in that area. There are about 25 property owners within the ten-year TOT, and all would probably cooperate with a drinking water protection plan for the area.

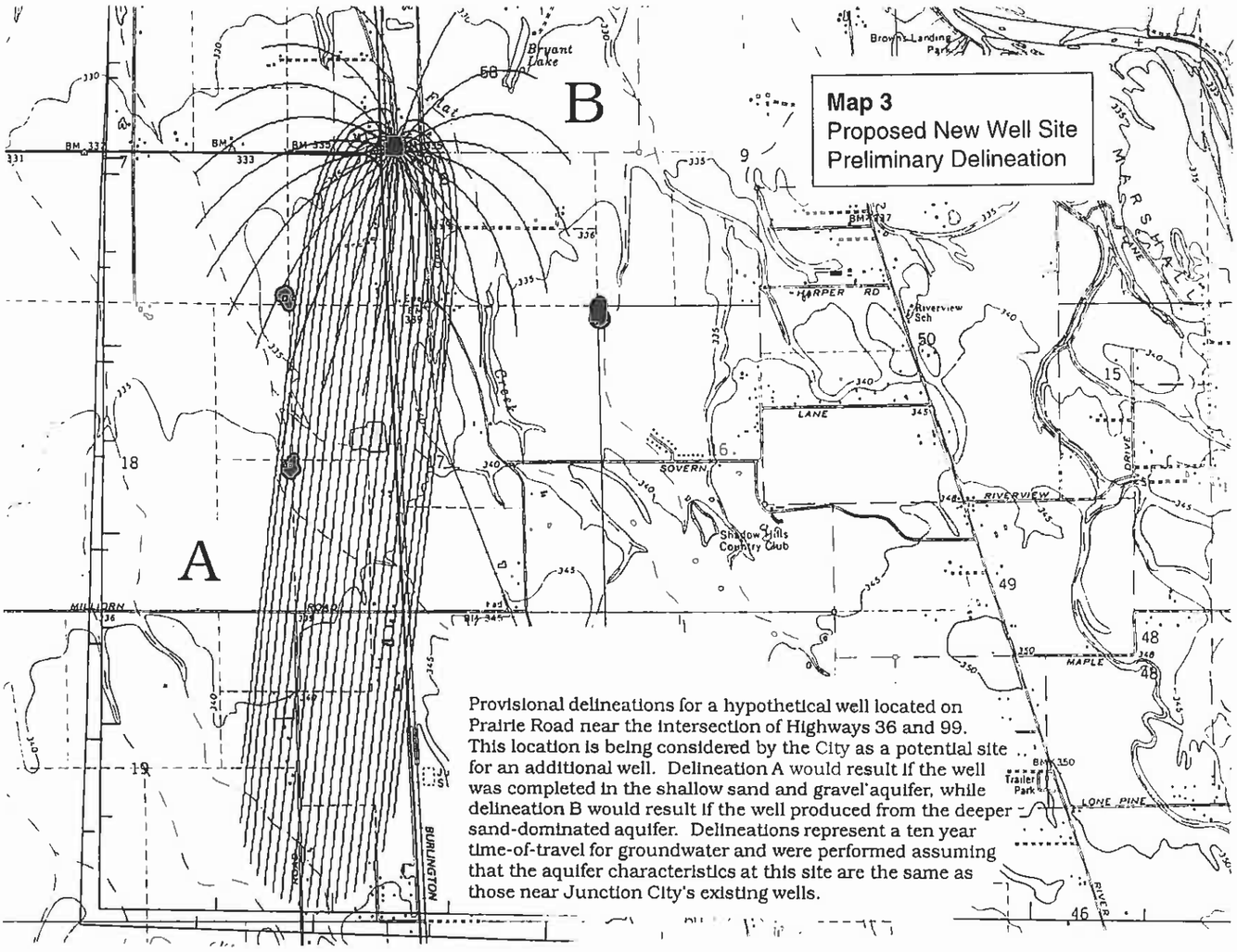
There are several medium- to high-risk activities within the groundwater protection area for the proposed well. The most significant are those related to transportation, which include two highways and two railway lines within the two-year TOT. A variety of hazardous materials are transported along these corridors, posing a risk primarily due to the potential of a spill event. In addition, there is a gas station currently located within the two-year TOT on the west side of Highway 99 that also creates a potential medium to high risk.

Projected land use in the area will bring greater diversity, complexity, and risk into the drinking water protection area for the proposed site. Most of the Highway 99 corridor is designated for future industrial development which will be realized as Junction City expands southward and Eugene expands in a northerly direction within their UGBs. This increased industrial development is likely to replace the existing agricultural use in the groundwater protection area and will probably represent a higher risk than the current land use.

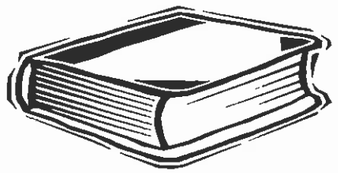
Other Possible New Well Locations

Keeping the new well within the general proposed vicinity, yet shifting the its location further away from major transportation corridors would still provide the desired service and reduce the risks associated with the current proposed site. In general, locating the new well west of Highway 99 is not a desirable alternative because a major chemical company is located along Milliron Road and adequate water supply may also be a concern in this area.

A site further east along Culver Road would be desirable because the well would be further away from the highways and railways that pose the greatest risk within the general area, both in terms of current use and the expected future use along Highway 99. Junction City could also expect to find willing sellers and cooperative property owners within this area.



Provisional delineations for a hypothetical well located on Prairie Road near the intersection of Highways 36 and 99. This location is being considered by the City as a potential site for an additional well. Delineation A would result if the well was completed in the shallow sand and gravel aquifer, while delineation B would result if the well produced from the deeper sand-dominated aquifer. Delineations represent a ten year time-of-travel for groundwater and were performed assuming that the aquifer characteristics at this site are the same as those near Junction City's existing wells.



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Appendices

Appendix A

JC seeks input on its future

JUNCTION CITY -- The public is invited to give input on two separate drafts that impact the future of the Junction City area. An open house has been scheduled for Friday, June 27 at Viking Sal Senior Center, 245 W. Fifth St. from 8 a.m. to 10 a.m. The Junction City Area Chamber of Commerce Greeters will gather from 9 a.m. to 10 a.m.

Residents and business people can review the committee findings of the Junction City Council's sponsored Transportation System Plan and Drinking Water Protection Plan. Members of the city stuff, council, committee members and professional support staff will be present to preview the two drafts.

Public input is being sought on the two plans that focus on the future of the city. The transportation draft examines the auto, truck, bus and bicycle traffic patterns now and projects usage through 2015 for Junction City. The Drinking Water Protection Plan deals with the protection of the groundwater which supplies the area's drinking water.

The Transportation Advisory Committee has been working on the plan since June of 1996. At the open house, residents will be able to see computer-generated maps showing current and future traffic patterns. Other displays will include the new bicycle path plan for the city and the results of a telephone survey conducted earlier this spring by an independent survey firm. Representatives of Lane Transit District will be in attendance to get input on its service to Junction City. Public views will also be heard on such issues as parking, future traffic alternatives and more.

The Drinking Water Committee will have computer-generated maps showing where the area's water supply for the next 10 and 20 years is located. The committee has prepared its rough draft that outlines an educational and regulatory plan to protect the water supply from pollution.

Both plans are more than public survey material. The Transportation Plan was mandated by the state of all governmental bodies. Once approved by the city council, state highway department and planning commission, the plan will be added to the city's comprehensive land use plan and would impact land use throughout almost the entire city.

The Drinking Water Protection Plan could also impact the land use within the city, especially around municipal wells.

Larry Ward of the Lane Council of Governments (LCOG) is the professional planner working with the committee on the transportation plan. The city was able to secure a grant from the state to conduct the study. The committee has been meeting for almost a year and includes members of the city council, city staff and residents, Shirley Heintz, Larry Brown, Jo Dodd and John Hamilton. Chairman is Winn Wendell, Junction City councilor.

Over the past year, the committee has examined alternatives to improving cross town and through town traffic. It has also met with LTD to seek ways to improve mass transit service to Junction City, and redesigned the city's bike path plan. A focal point of the study was Highway 99 through the city. Figures from the state indicate that today's traffic on the road has exceeded the number of cars using the road before the construction of I-5.

Julie Warncke of LCOG coordinated a professional staff that included Kathi Wiederhold of LCOG, Denise Kalakay of LCOG and Dennis Nelson of the Oregon Health Division, in assisting in the production of the Drinking Water Protection Program. The Citizens Advisory Committee is headed by Brad King. The committee includes representatives from agricultural, business, industrial, residential and governmental segments of the community.

After forming subcommittees to deal with the various interests, the committee has developed management plans and suggestions for groundwater protection. Junction City was given the opportunity to set up this unique program thanks to a grant secured by LCOG. Coburg and Junction City are among a few communities given the grants in the United States. Coburg began its study a few months before Junction City started and has already completed its plan.

While there are no mandates to cities to pass land use laws to protect ground water, the city council decided to accept the project because of the importance to the residents and staff recommendations that it could in the future be a factor in land use.

City Administrator Bert Likens and Public Works Director Bob Fountain worked on both committees as support staff during the planning process and will be at the open house.

For more information contact the Junction City City Hall at 998-2153.

Junction City seeks citizens to serve on water committee

JUNCTION CITY -- Junction City depends on groundwater for its drinking water supply. This groundwater is a valuable and high quality resource that will serve Junction City's residents far into the future. In recognition of this, Junction City is embarking on the development of a plan to make sure this resource stays clean and is adequately protected. This will be a cooperative effort between the community and the elected officials to protect the resource all Junction City residents depend upon for their drinking water. The plan will be prepared by a citizen's advisory committee who will ultimately advise the City Council on ways to ensure the City's groundwater stays clean for the generations to come.

Protection of groundwater is largely controlled by preventing contaminants from seeping down into the underground source of water, or aquifer. This is especially critical in the area defined as the "wellhead protection area." The wellhead protection area is the area that directly overlies that part of an aquifer that contributes water to a drinking-water well.

Protecting the city's underground drinking water supply is much more economical than clean-up if it becomes contaminated. For example, four cities in Oregon (Lake Oswego, Woodburn, Lebanon and Madras) have lost use of their wells, and two others (Milwaukie and Lakewood) have spent $.5 to $2 million on treatment facilities for their contaminated groundwater, plus up to $100,000 per year on operations and maintenance.

Junction City is one of two cities in the state to receive funds for development of a wellhead protection plan. This funding comes from the Environmental Protection Agency. The money will pay for technical and other resources necessary for defining the wellhead protection area and developing the plan. This effort will also provide valuable feedback to the state for the development of Oregon's wellhead protection approach.

The citizen's committee that will help develop Junction City's wellhead protection plan will be forming soon. This advisory committee, called the Drinking Water Protection Committee, will include key interests and stakeholders and be composed of local residents, business owners, industry and elected officials. Committee members will be from Junction City and the surrounding rural areas that may be affected by the plan. The committee's responsibilities will include making recommendations for plan development and implementation, assisting in citizen outreach and education, and providing input to ensure the wellhead protection plan fits local conditions and priorities.

The city is currently accepting applications for the citizen's advisory committee. If you would like to be on this committee, or are interested in learning more about drinking water/wellhead protection, contact Bob Fountain, Director of Public Works at 998-3125. Completed applications must be submitted by April 12.

Tri-County News
March 21, 1996

Our water: How to keep it safe, clean, drinkable

1. The livestock issue

BY LONNIE MCCULLOCH

"We are living and operating, it seems to me, in a time in which the problems of livestock production, which I deal with, suddenly become related to everything else. I can no longer say I am just a dumb engineer dealing with how to raise animals and keep the manure out of the creek."

Instead Ron Miner, Oregon State University Extension Service agent, now spends a good deal of his time trying to understand why people are so fearful of the damage done by livestock operations and how he can best address those fears. Miner was among the speakers this month at a coun-

See LIVESTOCK, page 13

2. Nitrate levels

BY LONNIE MCCULLOCH

Here in the mid-Willamette valley, we are blessed with lots of water — sometimes too much. With all the flooding of the past year, it's hard to believe there could ever be a shortage of water. Indeed, no shortages are expected for irrigators this year.

But abundant water does not necessarily translate into abundant clean water — water that's clean enough to drink, clean enough to swim in, clean enough to make the fish (and environmentalists) happy.

Fortunately, we are also blessed with community mem-

See NITRATES, page 11

3. Purity safeguards

BY LONNIE MCCULLOCH

Clean, safe drinking water is one of the most basic of needs. But how do you know if the water you drink is safe?

If you live in an incorporated city, it is the responsibility of your city officials to ensure your public water system meets certain standards (see related story). But if you live in a rural area, and rely on a private well for your drinking water, it is up to you to make sure your water is safe to drink.

It is something you should not take for granted, according to Ross Penhallegon of Lane County Extension. Wells

See PURITY, page 13

Nitrates

from page 1

bers who recognize this, and are taking steps to help ensure clean water for future generations. In this special agriculture section, we look at water, and the actions various community members are taking to help ensure clean water for the future. Along the way, we hope to answer some questions, some basic, others a little more complex.

Is the water you drink safe? How do you know for sure? What about the water at the old swimming hole? Is it safe to swim in? If the water at the swimming hole is warm enough for you, is it too warm for the fish?

And why should you care about any of this, anyway?

The latter question is easiest to answer. We all need clean water for drinking, cooking, bathing, laundry, and many other uses we may take for granted. Because we all use water, we impact the water quality where we live.

Other questions are more complex, such as "How well do you think you are managing your nitrates and your pesticides?"

That question was first posed to Coburg area farmers in 1991, said Ross Penhallegon of OSU/Lane County Exten-sion.

Their answer? "We think we're doing a good job, but we don't know for sure."

At the time, there was little data, and virtually no research being done. So Lane County Extension implemented a program to find out.

Beginning in May of 1992, the Extension Service has conducted a testing program for private wells. Since then, 1,503 private wells throughout Lane County have been tested.

The results were developed into a map showing nitrate levels throughout Lane County. Preliminary studies showed elevated nitrate levels in the Santa Clara, Coburg, and Junction City areas. The Santa Clara results were not a surprise, due to its large number of failing septic systems. But the elevated levels in the areas around Coburg and Junction City were unexpected.

This prompted a number of actions. Several programs were implemented to assess risk analysis both around the home and on the farm. In addition, a number of devices, known as passive capillary (PCAP) sampling stations were located on 14 farms around Lane County in order to track the movement of nitrates and pesticides in the field. The results of 4-1/2 years of testing show no pesticides above the maximum contamination level. According to Penhallegon, this shows "the farmers are doing an exceptionally good job of managing pesticides."

As for nitrates, "we have found levels from zero all the way up to 35 parts per million."

Despite the concerns, Coburg's public water supply has never even come close to violating clean water standards, according to Jack Harris of the city's public works department. According to Harris, the highest level of nitrates ever recorded in Coburg's water was 5.8 parts per million (ppm).

The safe "Maximum Contaminant Level" established by the federal government is 10 ppm. Harris noted that nearby Pioneer Valley Estates has equaled the MCL once, "a couple of years ago" but that neither water system had ever exceeded the MCL.

According to Penhallogen, high nitrate levels can be attributed to a number of causes.

"We are finding lots of failing septic tanks, or septic tanks that are not properly functioning," he said. "We are seeing a lot of uncovered compost and/or manure piles.

"Agriculture is part of the problem, not the whole problem, but part of the problem. We are seeing some crops where the nitrogen leaches fairly efficiently due to over-irrigation."

The on-farm study is in its second year of implementing better management practices to minimize nitrate leaching from over irrigation or over-fertilizing.

There are many things communities can do to protect groundwater, according to Penhallegon.

"The whole community needs to be aware to check their septic tank, no matter where you live, and to cover those compost piles. You need to not throw the paint, the turpentine, or oil out onto the ground when you are done with it."

As the population grows, small changes in individual behavior will become even more important, Penhallegon said.

Pro-active efforts of local communities have not gone unnoticed. The Lane County/OSU Extension Service and the City of Coburg have been recognized nationally as Groundwater Guardians, thanks to their efforts in protecting Coburg's groundwater through the Wellhead Protection program.

They are not alone. Junction City is also developing a Wellhead Protection Program, said Brad King of the Junction City Drinking Water Protection Committee. First advertising for volunteers last spring, the first meeting of the group took place in October, and the group now consists of about 17 people. The committee serves as an advisory group to the city council.

The group will develop a proposed plan that addresses topics such as wellhead protection management strategies, and implementation. City councilors will then decide whether they want to change the plan or adopt it as presented.

The state has been conducting groundwater surveys in an attempt to identify communities that would be likely to have high nitrate levels. Coburg and Junction City both fit that profile, according to King.

"I guess we're two of the earlier cities in the state to work to develop these plans," he said. "It's a voluntary plan, but it's something that needs to be done.

"Education is really a big part of this whole program, and the plan tries to address that in a big way — how to get the word out to people and make them aware that Junction City does draw its water from the ground."

The group meets on the fourth Thursday of each month.

"I think we've come a long ways already, really," King said. The group has already been educated about groundwater and the Wellhead Protection Program. Members have divided into subcommittees to address agricultural, commercial and industrial aspects; and contingency plan/new well/municipal uses. A "catch-all" sub-committee will, among other things, develop a plan for citizen involvement.

On Feb. 27, the committee heard an overview of the Junction City water system from Bob Fountain, public works director, and a brief presentation by Denise Kalskay of LCOG on the "top dozen" management strategies. Following this presentation was a wellhead planning exercise, presented by Julie Warncke of LCOG. In their final action of the evening, the committee identified and approved its voting membership.

Tri-County News
March 13, 1997

4-16-97

Maroon Gold

the student newspaper of Junction City High School *volume 50 issue 6*

Committee flooded with clean water ideas

■ *A group of community members offers suggestions on how teenagers can protect JC's water*

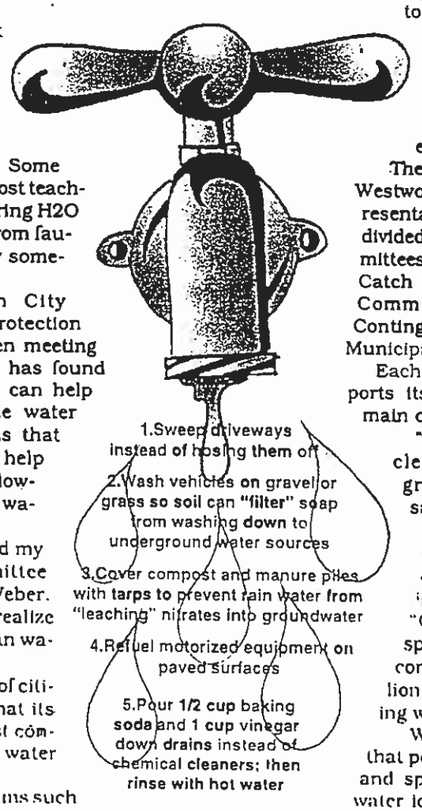
by Jon Weber

Students at JCHS seem to be slightly unhappy with the taste of the city's water, especially from the school's fountains. Some have noticed that most teachers simply buy or bring H2O rather than drink from faucets. Do they know something we don't?

The Junction City Drinking Water Protection Committee has been meeting since October and has found many ways people can help protect JC's fragile water supply. This means that even teenagers can help keep the faucets flowing with sparkling water.

"It really opened my eyes," said committee member Russell Weber. "Most people don't realize how vulnerable clean water really is."

The delegation of citizens has decided that its best weapon against contaminated drinking water is education.



Through programs such as placing tips on hazardous material disposal on city utility bills and printing notices in local newspapers, the committee has begun to spread the word on how to keep the area's water clean.

"It is far easier and less expensive to prevent groundwater pollution than try to clean it up later," Weber pointed out. "Where does that money come from? The taxpayers."

The group, chaired by Westwood Industries representative Brad King, is divided into four subcommittees: Agricultural Use, Catch All, Industrial / Commercial Use, and Contingency / New Well / Municipal Use.

Each subcommittee reports its findings to the main committee.

"People really take clean water for granted," Weber said.

As an example of how delicate JC's water system is, he stated that "One gallon of spilled gasoline can contaminate one million gallons of drinking water."

Weber also asked that people read, follow, and spread these clean water ideas. "If just one person changes his ways to help keep the water clean, than all our work will be a success."

Tri-County ...

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...on counties since 1977

Junction City, Oregon 97448 • 998-3877 October 23, 1997 • Vol. 21, No. 8 • 2 Sections, 32 pages 50 Cents

Junction City adopts drinking water plan

BY LONNIE L. MCCULLOCH
News Editor

JUNCTION CITY -- The city council unanimously approved a Drinking Water Protection Plan at its regular meeting of Tuesday, Oct. 14. The plan is designed to protect the groundwater that is the source of drinking water for Junction City, according to Brad King, chairman of the Citizens Advisory Committee which developed the plan.

The plan relies heavily on education to accomplish its goals, with almost no new regulation, according to King. "I think a lot of people felt there would be a big push for new laws, new regulation," said King. "But the committee really avoided that." King said that "education is really the thrust of the plan." The plan recommended, but does not require, that businesses applying for future building permits include a copy of the Hazard Communication Plan that is required by OSSHA for any hazardous materials.

Council member Bev Ficek, who was appointed in February to fill the vacancy created by the resignation of Bill Barrong, said that she was very impressed by the commitment of the committee on this project, and by the leadership shown by committee chairman Brad King. Mayor Shear agreed, saying he had heard the same thing from several people. The mayor thanked Mr. King, and the rest of the committee for their work.

The only other city in Oregon to adopt such a plan is Coburg, according to King. Both cities were selected to participate in a pilot project to evaluate the Oregon Wellhead Protection Program Guidance Manual as a guide for cities to use in developing a drinking water protection plan. The Guidance Manual was developed jointly by the Oregon Department of Environmental Quality and the Oregon Health Division.

"We are obviously pleased to see communities take such positive steps towards protecting their drinking water resource," said Dennis Nelson, Groundwater Coordinator for the Oregon Health Division's

See PLAN, page 5

Plan_ from page 1

Drinking Water Program. Nelson said the primary lesson the Health Division had learned in Coburg and Junction City's use of the Guidance Manual was "how we can best provide technical assistance, and help communities make their own decisions in how to best protect their drinking water source. That clearly will be reflected in future efforts with communities," as the Guidance Manual is refined. Nelson said he felt that working with Junction City and Coburg had "facilitated the state's involvement in helping communities move forward with this."

The project was largely funded by a grant from the U.S. Environmental Protection Agency to the Lane Council of Governments (LCOG). King said that it had been a real pleasure working with LCOG on the project, and thanked LCOG employees Denise Kalakay and Julie Warncke, who were present at the meeting. He also recognized the involvement of Dennis Nelson of the Oregon Health Division.

In other action, the council unanimously approved a request from James and Shirley Heintz, owners of the Montage Restaurant, for an addition to their already existing liquor license. The change allows the restaurant to serve open glasses of beer and wine. Police Chief Cahill had been consulted, and had no problem with the amendment to the license.

The council also heard a report from Doug Kokkeler, Recreation Coordinator-Supervisor for the city. Kokkeler reported they were two weeks from the end of their first soccer season, with about 400 kids involved.

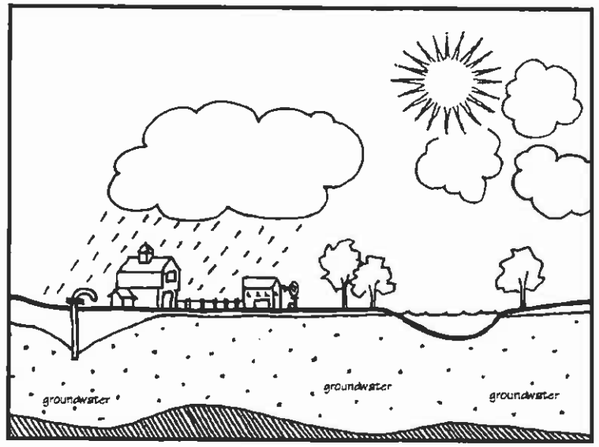
Public Works Director Bob Fountain reported the city had auctioned some excess equipment on Saturday. He reported the auction had grossed about $3,500, with the city netting about $2,300. Fountain also reported the city was ready to begin "leaf season," and would begin picking up leaves as a public service.

Appendix B

Groundwater Basics

What is groundwater?

Groundwater is water that has percolated into the ground from the surface. Groundwater does not occur as underground lakes or streams. Instead, it occurs in the open spaces between soil and rock fragments below the water table. An aquifer is any geologic material, e.g., sand and gravel, fractured bedrock, etc., that is filled with water and will yield that water to a well. Groundwater moves slowly, generally less than a foot per day, from where the water table is high to where it is lower.



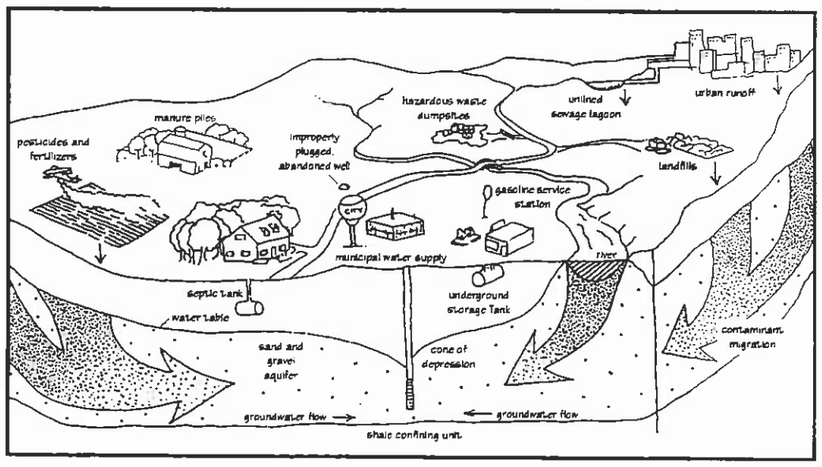
Oregon Groundwater Usage

- Agriculture (72%)
- Public Supply (12.6%)
- Domestic/Commercial (10.9%)
- Industry/Mining (4.5%)

Who uses groundwater?

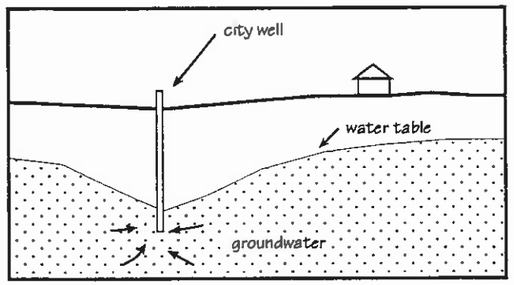
Groundwater is the primary source of drinking water for over 750,000 Oregon residents. ***Groundwater is the sole source of drinking water for residents of Junction City and the surrounding area.***

How does groundwater become contaminated?



Contaminants produced from land use activities can be carried by percolating water into the ground, contaminating a groundwater supply. Proper safeguards can help ensure that land use activities do not contaminate groundwater. Educating people about these safeguards is the basic purpose of a Drinking Water Protection Plan.

Drinking Water Protection

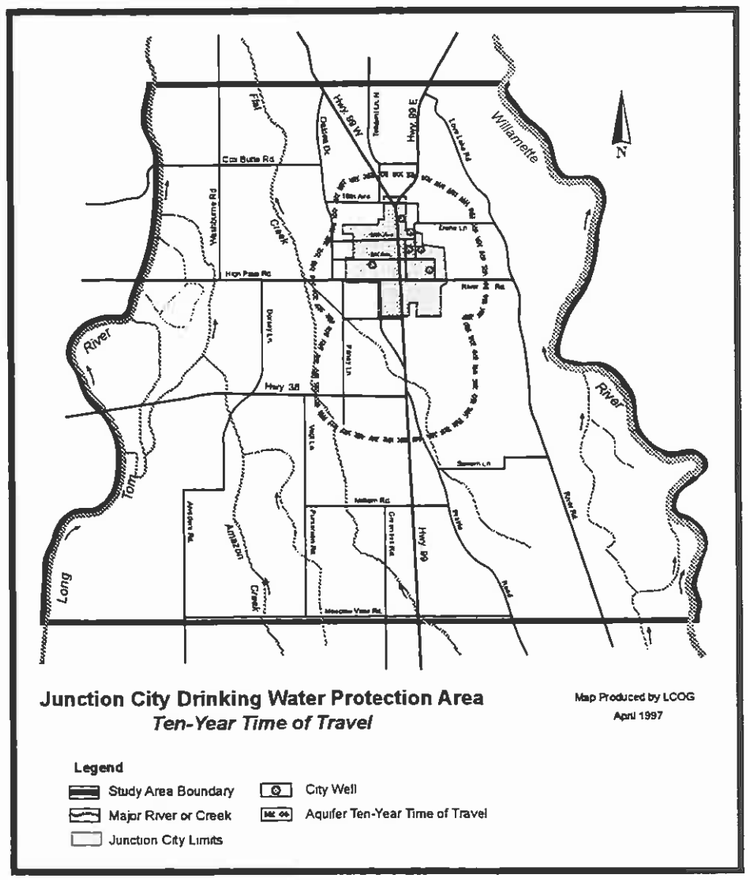


What is a Drinking Water Protection Area?

A Drinking Water Protection Area is the area of land near a well that overlies that part of the aquifer that supplies the well. A Drinking Water Protection Area is determined from information gathered from well records, pump tests, soil surveys, and subsurface geologic mapping. This information indicates where the aquifer is and the direction and rate of groundwater flow.

Junction City's Drinking Water Protection Area

Time of travel is the amount of time it takes groundwater to flow to a given well. Drinking Water Protection Areas are usually broken into various time of travel zones (e.g., 2-year, 5-year, 10-year). For more information on Junction City's Drinking Water Protection Plan, contact Junction City Public Works Department at 998-3125.



Prevention is the key.

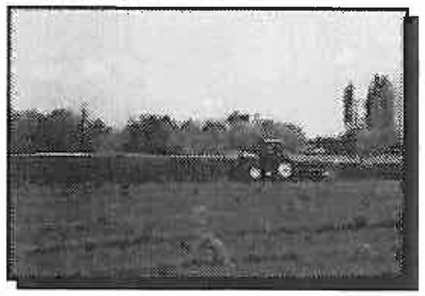
Preventing contamination is the key to keeping groundwater supplies safe. Once a drinking water supply becomes contaminated, a community is faced with the difficult and costly task of installing treatment facilities or locating an alternative source. Some examples of this occurring in Oregon are:

- Milwaukie spent $2,000,000 on study and treatment and $100,000/year on operation and maintenance.
- Over $500,000 was spent on study and treatment at Lakewood Estates. Residents used bottled water for two years.
- Lake Oswego, Woodburn, Lebannon, and Madras have all lost use of wells due to contamination.

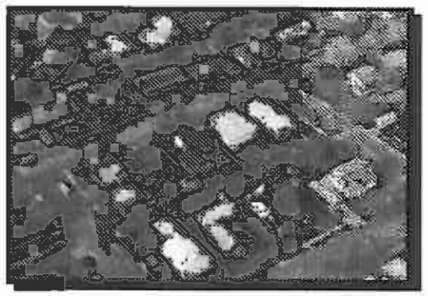
A Plan to Protect Our Water

A committee of local residents studied Junction City's groundwater and land use, and developed a Drinking Water Protection Plan. Commercial, industrial, and agricultural businesses, as well as rural and urban residents, all have the potential to impact our drinking water. The Plan emphasizes that if everyone does their part, we will have safe drinking water into the future.

The following are examples of management strategies found in the Junction City Drinking Water Protection Plan.



❒ *Provide farmers and rural residents with information on how to properly care for their wells. Improperly constructed, maintained, or abandoned wells can provide a direct conduit for contaminants to reach the aquifer.*



❒ *Promote proper storage and disposal of hazardous materials by businesses, farmers, and urban and rural residents.*

❒ *Look for groundwater protection tips in your monthly city water/ sewer/garbage bills.*

❒ *Educate businesses about what they can do to help protect our groundwater.*

Be groundwater aware! Protecting Junction City's drinking water is everyone's responsibility. Take the time to learn about your groundwater and what you can do to protect it.

For more information on the Junction City Drinking Water Protection Plan, contact the Public Works Department at 998-3125.

Appendix C

Junction City Drinking Water Protection Committee
Catch-All Subcommittee

Monthly Tips For Junction City Water/Sewer/Garbage Bills

1. One gallon of gasoline can contaminate 1 million gallons of water. Be sure to maintain underground fuel tanks.

2. Groundwater turns into well water which turns into drinking water. Don't pollute.

3. Junction City depends 100% on groundwater for our drinking water supply. Think about what you drink before you dump it down the sink.

4. Clean drinking water depends on the efforts of all Junction City residents.

5. Proper disposal of all groundwater contaminants is:
   a) A big responsibility, or
   b) Your responsibility, but we can help. Call:

   a) Lane County Hazardous Waste 687-4119
   b) Department of Environmental Quality 1-800-452-4011

6. Never pour paint or thinner down the storm drain. It may end up in your glass of water.

7. Looking for a way to save some money on your water bill?
   a) Turn off the water when you brush your teeth & save about 2 gallons of water.
   b) Turn the water off when you wash your hands & save about 1 gallon of water.
   c) Fill a pitcher with water & keep it in the fridge instead of running water every time you want a drink.

8. Lane County's semi-annual Household Hazardous Waste Roundup on the first Friday & Saturday of May & December.

9. Dumping used motor oil in the backyard or down the storm drain can contaminate well water.

10. One quart of used oil can foul the taste and purity of 250,000 gallons of drinking water.

11. Overuse of fertilizer & pesticide is a waste of money and threat to our drinking water.

12. Improper disposal of household chemicals can contaminate our drinking water.

13. Consider potential impacts on our drinking water when disposing of household chemicals.

14. Protect our drinking water. If using chemicals is necessary, choose the least toxic product.

15. Slow drain? Pour _ cup baking soda - then 1 cup vinegar. Let fizz. Then hot water rinse several minutes.

16. What you hose off your driveway, may end up in your cup someday. Sweep it up instead.

17. Stop and think,
    You may drink
    What you pour
    down your sink.

18. Preventing contamination is the least expensive way to ensure clean drinking water. Please do your part.

19. To protect our drinking water,
    MORE is NEVER BETTER
    in amount of sprayed chemicals,
    or spread fertilizer.

20. What's more important? That every glass of water be clean or that the very last weed or pest is dead? Think about what and how much you use and how you use it.

Catch-All Committee
4/10/97 meeting

Appendix D

Junction City Drinking Water Protection Committee Members

Alfred Christensen
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Junction City OR 97448
998-2774

Gerald Edwards
Agripac
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998-2841

Bev Ficek
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Junction City OR 97448
998-5118

Don Fisher
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998-8000

Doug Graves
92107 River Rd.
Junction City OR 97448
689-0203 (h)

Les Howard
PO Box 11367
Eugene OR 97440
998-8888 (w)
682-8382 (h)

Brad King, Chair
Westwood Ind.
PO Box 2711
Eugene OR 97402
998-2331 (w)

John Lagerquist
92731 Pebble Beach Ln.
Junction City OR 97448
744-4610 (w)
998-8610 (h)

Sandy O'Malley
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Junction City OR 97448
726-7435 (w)
689-0203 (h)

Bob Nelson
733 Maple St.
Junction City OR 97448
998-2388 (w)
998-8625 (h)

Pat Straube
688 Greenwood
Junction City OR 97448
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Margaret Thumel
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Carla Wahl
810 Birch St.
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998-8156 (h)

Russ Weber
765 Birch St.
Junction City OR 97448
688-8210 (w)
998-2185 (h)

Winn Wendell
750 Birch St.
Junction City OR 97448
998-3491 (w)
998-3948 (h)

Corky Wilde
1180 Quince
Junction City OR 97448
998-6722 (w)

Non-Voting Member
Herb Christiansen
815 Alder
Junction City OR 97448
998-1438

City Staff
Bert Likens
City Administrator
PO Box 250
Junction City OR 97448
998-2153 (w)

Bob Fountain
Public Works Director
PO Box 250
Junction City OR 97448
998-3125 (w)

LCOG Staff
Denise Kalakay
682-7415
Julie Warncke
682-7435
Kathi Wiederhold
682-4430

LCOG
125 E. 8th Ave.
Eugene OR 97401

Oregon Health Division
Dennis Nelson
682-4424

Appendix E

Draft Letter to Rural Residents

Dear Property Owner:

As you may know, Junction City is taking a proactive approach in protecting our drinking water supply by developing a local wellhead protection plan. A drinking water protection plan is developed by identifying the area where our water supply originates and protecting that area. As your agricultural/rural residence representatives on the Junction City Drinking Water Protection Committee, we are developing a plan that protects groundwater in ways that work best for rural land owners.

Our local wellhead protection team is working to develop this plan with involvement from as many local citizens and property owners as possible. We think that by everyone doing something we can make a difference in making sure that our drinking water is safe. Through educational efforts, residents within the Junction City area will be: reducing their home and lawn chemical use, maintaining their septic systems on a more regular basis, and learning how they can become more responsible groundwater friendly home owners. Business owners and managers in the Junction City area will be reviewing educational materials to learn about safer groundwater friendly practices.

Like many of the businesses in Junction City, the agricultural community is already heavily regulated and doing many things that protect groundwater. We will periodically be sending you educational information about voluntary practices you can apply to help ensure that your water and the community's water is safe to drink. We think that through collaboration, communication, and cooperation with all members of the Junction City community, we can continue to develop a safe drinking water program that is beneficial to all of us.

Thank you for your participation in this important community effort. It is critical to the protection of our drinking water supply. If you have any questions about the Drinking Water Protection Program, please feel free to call the following members of the Drinking Water Protection Committee.

Remember, it's your water too.

Sincerely,

_____
Sandy O'Malley (689-0203)

_____
Gerald Edwards (998-2841)

_____
Russel Weber (998-2185)

_____
Don Fisher (998-8000)

Appendix F

Draft Letter to Area Businesses

Dear Junction City Business Owner/Manager:

As you may already know, Junction City has taken a proactive approach to protecting our drinking water supply by developing a local drinking water protection plan. A drinking water protection plan is developed by identifying the area where the water supply originates and protecting that area. Junction City relies entirely on groundwater for its drinking water supply. As industrial/commercial representatives on the Junction City Drinking Water Protection Committee, we are developing the plan that protects groundwater in ways that work best for local businesses.

Many types of land uses have the potential to impact our drinking water. Farmers, schools, and rural and city residents are all pulling together with the sense that *by everyone doing something* we can all make a difference in making sure our drinking water is safe. We recognize that the business community is heavily regulated and is already doing many things to protect drinking water. That is why we are working on ways to let business owners know how to protect our groundwater for low or no cost, to reduce business liabilities, and provide assurance of safe drinking water in the future.

To this end, we invite you to take some time to review the attached information that lists resources available to you to become a more groundwater active and responsible business member of the community. Resources range from state and federal assistance, such as the Pollution Prevention Program sponsored by the Department of Environmental Quality (DEQ), to private companies, such as your insurance carrier or companies that deal in hazardous waste disposal.

Recognizing that having everyone do something is the best approach to pollution prevention, we also encourage you to raise awareness of the potential for groundwater pollution among your employees. This can be accomplished by handing out literature (see attached "Groundwater Basics" flyer), inviting in guest speakers for meetings, or participating in other awareness raising activities. Two awareness-raising activities proposed in the Drinking Water Protection Plan include stenciling storm drains to make people think about what they pour down a storm drain and erecting signs to let everyone know that they are entering a drinking water protection area. There will be opportunities for businesses to participate as these activities get under way.

Thanks in advance for your participation in this important long-range community effort to protect our drinking water supply. We believe that efforts on your part to cooperate, collaborate, and participate in this endeavor make good business sense by reducing your liabilities and making you an active member of our community.

If you have any questions, feel free to call any of the following members of the Junction City Drinking Water Protection Committee or the Junction City Public Works Director.

_____
Brad King, Westwood Industries

_____
Winn Wendell, AG Northwest, Inc.

_____
Les Howard, LJ Howard Co.

_____
Corky Wilde, Wilde's Tire Store

_____
Pat Straube, Dari-Mart

Resources available to help businesses prevent pollution to Junction City's drinking water supply

Organization	Services Offered	Contact Person
Insurance Carriers		
Worker's Comp Insurance Carrier	*(Fill in)*	Your contact
Fire & Liability Insurance Carrier	*(Fill in)*	Your contact
Other Private Companies		
Oregon Environmental Technology Association	Network of environmental service providers	David Welsh (503) 227-6361
See Yellow Pages under "environmental and ecological services"		
Local Government Resources		
Junction City Public Works Department	Information and referral on Drinking Water Protection Plan	Bob Fountain (541)998-3125
Commercial/Industrial Members, Drinking Water Protection Committee	Information and referral on Drinking Water Protection Plan	*(Insert names & phone numbers)*
State Government Resources		
OSU Extension Service	Manufacturing efficiency audits (water, energy, raw materials, for SIC codes 20-39)	Greg Wheeler (541) 737-2515
Oregon Economic Development Dept.	Manufacturing extension program technical assistance	Peter Schmid (503) 986-0192
Oregon Dept. of Energy	Energy efficiency audits	Mark Kendall (503) 378-8444
Oregon DEQ: Hazardous Waste Program	Hazardous waste technical and compliance assistance	DEQ staff (800) 452-4011
Oregon DEQ: Toxics Use Reduction Program	Technical assistance (pollution prevention and planning)	DEQ staff (800) 452-4011
Oregon DEQ: Local Office (Eugene)	Local contact	DEQ staff (541)686-7888
Federal Government Resources		
USDOE Pollution Prevention Information Resource Center	Free on-site pollution prevention technical assistance for small businesses, personnel exchanges, laboratory assistance	Gary Spanner (509) 372-4296

Appendix G

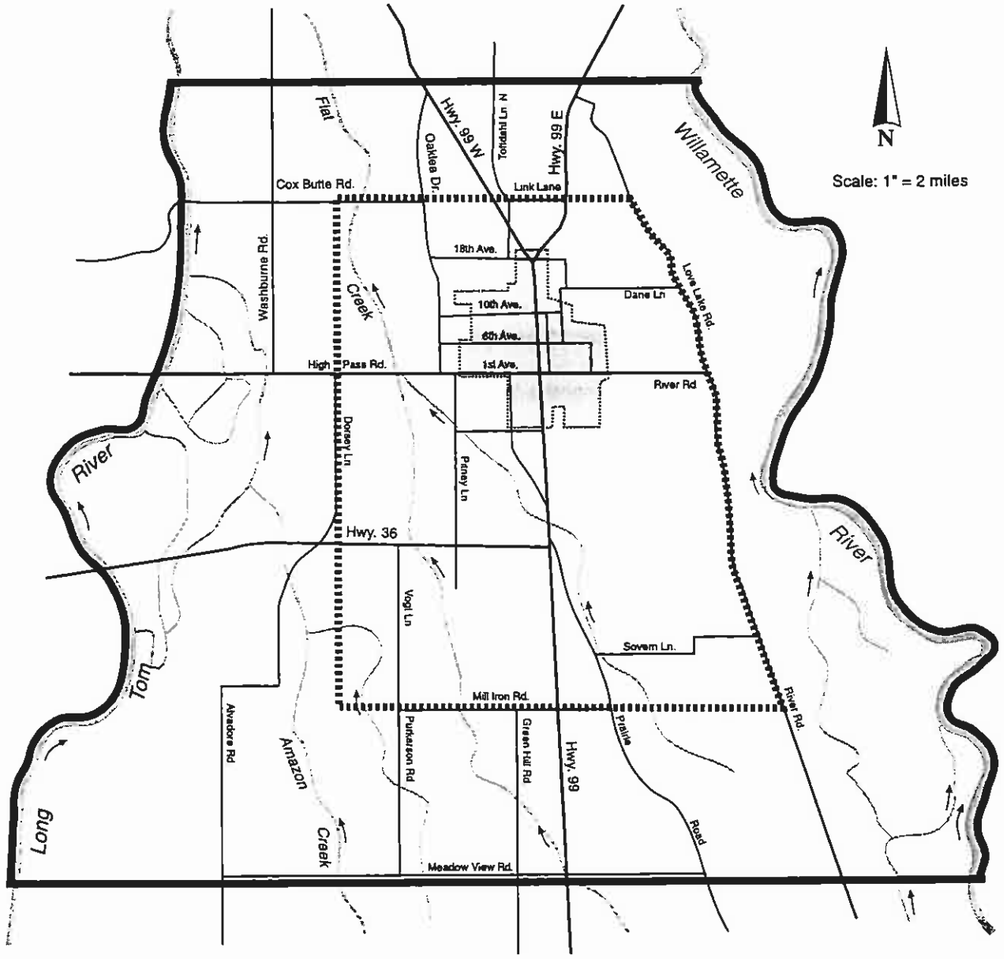
Drinking Water Protection Area Defined by Roads and by Township/Range/Section

The Commercial/Industrial section of the Plan includes a strategy that calls for developing a more user-friendly drinking water protection area (Commercial/Industrial Goal 2, Strategy 1). This simplified drinking water protection area will encompass the entire ten-year TOT. The committee proposed two versions of this simplified protection area; one that uses roads, and another that uses township, range, and section. These simplified protection areas will allow the City and committee members to communicate more easily with people who do not have access to a map of the drinking water protection area as delineated by TOT. The actual drinking water protection area will still be as shown in Map #2, but these simplified versions may be useful during implementation, particularly relating to education and discussions with Lane County.

Drinking Water Protection Area by Township/Range/Section

The following 21 sections encompass the entire ten-year TOT drinking water protection area.

Township	Range	Section
15 S	5 W	25
15 S	5 W	36
16 S	5 W	1
16 S	4 W	6
16 S	4 W	5
16 S	4 W	4
16 S	5 W	12
16 S	4 W	7
16 S	4 W	8
16 S	4 W	9
16 S	5 W	13
16 S	4 W	18
16 S	4 W	17
16 S	4 W	16
16 S	4 W	15
15 S	4 W	30
15 S	4 W	29
15 S	4 W	28
15 S	4 W	31
15 S	4 W	32
15 S	4 W	33



Junction City Drinking Water Protection Plan
Study Area Map
Drinking Water Protection Area Defined by Roads

Legend

- Study Area Boundary
- Major River or Creek
- Junction City Limits
- Drinking Water Protection Area Defined by Roads

Map Produced by LCOG
September 1997

Appendix H

RESOLUTION NO. 669

A RESOLUTION ADOPTING THE JUNCTION CITY DRINKING WATER PROTECTION PLAN.

WHEREAS, the City of Junction City obtains all of its drinking water from a groundwater aquifer, and

WHEREAS, protection of Junction City's drinking water supply is consistent with the goals and policies of the Junction City Comprehensive Plan; and

WHEREAS, the Junction City City Council appointed the Drinking Water Protection Committee in September 1996, and charged the committee with developing recommendations to protect Junction City's groundwater source of drinking water; and

WHEREAS, the Drinking Water Protection Committee has developed the Junction City Drinking Water Protection Plan, using the Oregon Wellhead Protection Program Guidance Manual as a guide and incorporating opportunities for public involvement throughout the process; now, therefore

THE CITY OF JUNCTION CITY DOES RESOLVE AS FOLLOWS:

Section 1. The City resolves that protection of its drinking water is a priority objective.

Section 2. To help protect its drinking water supply, the City hereby adopts the Junction City Drinking Water Protection Plan, incorporating that Plan into this resolution by reference, and directs City staff and the Drinking Water Protection Committee members to undertake efforts to implement the recommendations included in the Plan.

Section 3. It is a policy of the City to protect its drinking water supply by following through with implementation of the Junction City Drinking Water Protection Plan. In support of this, the City will incorporate the Drinking Water Protection Area Map and appropriate policies regarding the Drinking Water Protection Plan into its Comprehensive Plan as a part of its next Periodic Review process.

Passed by the Council this 14th day of October, 1997.

Approved by the Mayor this 14th day of October, 1997.

APPROVED:

Steven L. Shear, Mayor

ATTEST:

Barbara Scott, City Recorder

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