



Ethylene Dibromide in Ground Water - Occurrence, Hydrogeology and Possible Sources

Townsend Business Park
23303 NE Sandy Boulevard
Fairview, Oregon

December 2, 2016

Prepared for:



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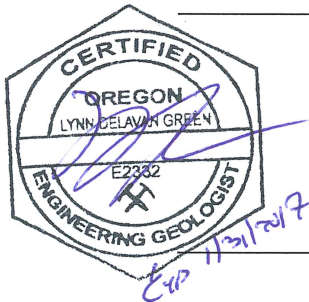


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Contents

1.0	INTRODUCTION	1
1.1	Background	1
1.2	Purpose.....	2
1.3	Scope	2
2.0	SITE SETTING	2
2.1	Description and Location.....	2
2.2	History of Pesticide Use at Townsend Farms	2
2.3	Climate	3
2.4	Topography	4
2.5	Cultural Setting	4
3.0	GEOLOGY	5
3.1	Regional Geologic Setting	5
3.2	Site Geology	6
4.0	HYDROGEOLOGY	6
4.1	Surface Water in the Immediate Vicinity of the Subject Property.....	6
4.2	Site Hydrostratigraphic Units	7
4.3	Summary - Conceptual Hydrogeologic Model	8
4.4	Water Well Records	9
4.4.1	Oregon Water Resources Department (OWRD) GRID Database.....	9
4.4.2	Site and Vicinity Water Supply Wells.....	9
4.4.3	Ground Water Capture and Time of Travel Curves	10
4.4.4	Wells in Geologic Cross Sections.....	11
4.4.5	Review of OWRD’s Water Rights, Permits and Claims	12
5.0	ETHYLENE DIBROMIDE (EDB)	13
5.1	Chemical Uses.....	13
5.2	Cleanup Standards	13
5.2.1	Risk-Based Decision Making	13
5.2.2	Maximum Contaminant Levels	13
5.3	Current Understanding of Extent of Impacts at the Site.....	13
5.3.1	Nature and Extent of Soil Impacts.....	Error! Bookmark not defined.
5.3.2	Rapid Soil Solutions, Letter Report dated August 26, 2015	13
5.3.3	Extent of EDB in Ground Water	14
6.0	DISCUSSION	18
7.0	SUMMARY AND CONCLUSIONS	20
8.0	LIMITATIONS	22

Tables (in text)

- 4-1 Water Supply Well Construction Summary
- 5-1 Water Supply Well EDB Data Summary
- 6-1 Similarity of EDB Detects, CoF Well #6 and TFI Well #3
- 6-2 Correlation of Earliest EDB Detects TFI Well #2 / #3 to Modeled Detects in CoF Well #6

Table (after text)

- 1 Ethylene Dibromide Data for Select Water Supply Wells

Figures (in text)

- 2-1 Portland Climate Data

Figures (after text)

- 1 Site Vicinity Map
- 2 Site Plan
- 3 1970 Aerial Base Map
- 4 Zoning Map
- 5 Geologic Cross-Section A-A' (SW to NE)
- 6 Geologic Cross-Section B-B' (SE to NW)
- 7 Well Location and Cross Section Diagram
- 8 Time of Travel (Capture) Curves for Select Wells
- 9 EDB Concentration vs. Time, TFI and CoF Wells
- 10 EDB Concentration vs. Time, Correlation of EDB Detects, TFI Well #2 / #3 and CoF Well #6

Attachment

- A Water Well Logs / Water Rights

Acronyms and Abbreviations

bgs	below ground surface
CFSLs	Clean Fill Screening Levels
CoF	City of Fairview
CU1	Confining Unit 1
CU2	Confining Unit 2
CWV	City of West Village
EDB	ethylene dibromide
ENW	EVREN Northwest, Inc.
EPA	US Environmental Protection Agency
FF	Fairview Farm
GDI	GeoDesign, Inc.
GRID	Ground Water Information Database
MCLs	Maximum Contaminant Levels
MCLGs	Maximum Contaminant Level Goals
OCP	organochlorine pesticides
ODEQ	Oregon Department of Environmental Quality
OHA	Oregon Health Authority
OWRD	Oregon Water Resource Department
RBCs	risk-based concentrations
RBDM	<i>Risk-Based Decision Making for Remediation of Petroleum Contaminated Sites,</i> ODEQ September 2003 Guidance Document
RSS	Rapid Soil Solutions
SGA	Sand and Gravel Aquifer
SLRBC	screening-level risk-based concentrations
SU1	Siltstone Unit 1
SU2	Siltstone Unit 2
TFI	Townsend Farms, Inc.
TGA	Troutdale Gravel Aquifer
TOT	time of travel
TSA	Troutdale Sandstone Aquifer
UP	Union Pacific

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Townsend Business Park
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1.0 INTRODUCTION

At the request of Mike and Margaret Townsend of Townsend Farms, Inc. (TFI), EVREN Northwest, Inc. (ENW) has prepared this report describing the current understanding of occurrence, hydrogeology and possible sources of ethylene dibromide (EDB) in ground water near the Townsend Business Park (subject site; Figure 1).

1.1 Background

Townsend Business Park was acquired in phases by TFI. As we understand, the original approximately 32-acre homestead supported a dairy, orchards and later berry crops and a fruit (berries, cherries, pineapple, and mangos) packing plant. TFI acquired additional properties in 1977 and 1982, which raised the total land area under TFI's management to approximately 98 acres. Although TFI had planted berry crops on portions of the original 32-acre tract, most of the 67-acres TFI acquired in 1977 through 1982 was already planted in canes, which TFI continued to maintain and harvest. The reason that this is significant is because pesticides are only applied prior to planting berry canes.

With the exception of the fruit packing plant, agricultural production at the site ceased in 2000, and the property was subdivided into 21 parcels and redeveloped as the Townsend Business Park in 2004 (see Figure 2). Prior to halting production, TFI cultivated portions of Lots within this business park (6 and 21, as well as Lots 7, 8, 9 and 10), however, never cultivated Lots 12, 13 or 14.

TFI maintains a ground water right (GR3339) at its berry packing plant in Fairview, Oregon. Up through March 2001, ground water was obtained from a 6-inch diameter by 76-foot deep well (MULT 1359) located west of the packaging plant. Soon thereafter, ground water was obtained from a new 8-inch diameter by 245-foot deep well (MULT 63478) completed on March 26, 2001.

EDB was first detected (0.05 micrograms per Liter [$\mu\text{g/L}$]) in TFI's shallow water supply well MULT 1359 on October 5, 1994, which is the earliest recorded result. EDB was again detected in MULT 1359 on February 21, 1995, at a concentration of 0.02 $\mu\text{g/L}$ and later, on August 28, 2015, at a concentration of 0.068 $\mu\text{g/L}$. EDB was not detected in TFI's deep water supply well (MULT 63478) until November 30, 2010, when the maximum recorded EDB concentration of 0.102 $\mu\text{g/L}$ was reported. EDB was detected in 16 out of 35 analyses during the period July 11, 2011 through August 10, 2016.

1.2 Purpose

The purpose of this report is to develop a hydrogeologic model, map the occurrence of the EDB in ground water near the subject site, and identify possible sources for this compound in the regional water wells.

1.3 Scope

The scope of this evaluation includes the following:

- Detail the history of pesticide use at Townsend Farms.
- Review of regional and site geology and hydrogeology (site characterization).
- Review of available water well data, including a well log database search.
- Review of ground water rights and permits near the site.
- Review occurrences of EDB in other water wells in the area.

2.0 SITE SETTING

2.1 Description and Location

The approximately 98-acre Townsend Business Park is composed of 21 separate lots (Lots 1 through 21) located north of NE Sandy Boulevard, and east of NE 223rd Avenue in Fairview, Oregon 97209 (subject site; Figures 1 and 2). Ten (10) of the lots have been developed with eight (8) large flat-topped industrial buildings and numerous smaller buildings in the Townsend Business Park No. 2 plat, including from east to west:

- Townsend Commercial
- Townsend Plant Expansion
- Birtcher Development (three large warehouse buildings)
- Knight Transportation
- Thermo King Northwest
- International Truck
- General Pacific

Vacant former agricultural lots include (east to west):

- Lot 11 (purchased in early 2016)
- Lot 20, Lot 21, and Lot 6 (to be retained by TFI for future plant expansion)
- Lot 10, Lot 2, and Lot 15.

The Union Pacific (UP) railroad right-of-way is adjacent to the northern site boundary, and Brasher's Portland Auto Auction is adjacent to the eastern site boundary. The subject site is irregular in shape and located primarily in an industrial and commercial area.

2.2 History of Pesticide Use at Townsend Farms

TFI does not have information on pesticides used during the early history of its original homestead, nor does TFI have information on the pesticides used on the previously cultivated

acreage the family acquired from others in 1977 through 1982. TFI reported that Telone / Telone II was used as a soil fumigant and nematicide when berries were first cultivated at the site from 1961 through 1982. TFI noted that the family could not afford bromide (Br-based pesticides) applications such as EDB due to their relatively higher cost¹.

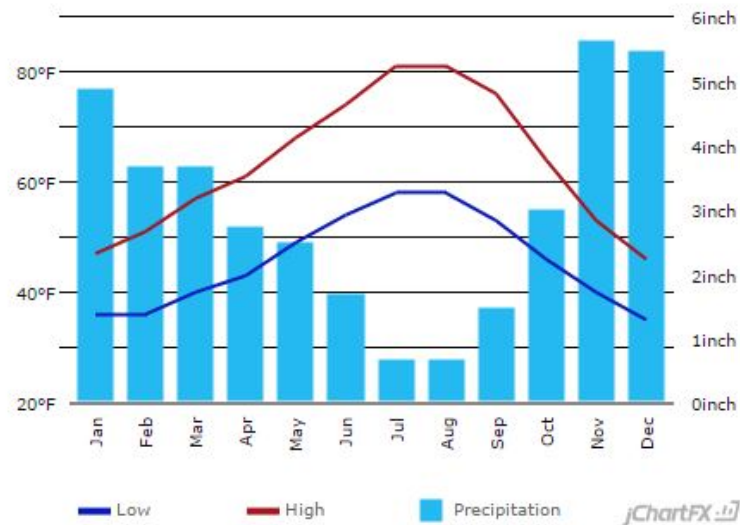
Nematicides were typically shanked into the ground in the fall prior to planting canes, and the ground was compressed and tarped until spring. Then in the spring, tarps were removed and canes were planted. No further fumigation occurred after the canes were planted. Such treatments were typical when TFI planted a portion of the original 32 acres starting in about 1961. TFI reported that following the acquisition of 67 acres in 1977 through 1982, only one additional lot associated with the new acquisition was treated with Telone II and planted. This is because most the 67 acres had already been planted. Pesticide use entirely ceased at the site in 1982, according to TFI.

As shown on Figure 3, agricultural activity was widespread in the Fairview, Wood Village, Troutdale, Gresham and east Portland area in 1970. Besides TFI, and lands that would later be acquired by TFI, substantial lands south and east were cultivated in row crops, many of which were likely berry crops.

2.3 Climate

Fairview, Oregon, a suburb of Portland, has a temperate climate with dry warm summers and mild winters with moderate year-round temperatures, wet winters, dry summers, and transitional summer and fall seasons. Summers in Fairview are warm to hot, dry and relatively sunny with low humidity. Spring and fall are typically mild, with temperatures in the 50s and 60s and overcast skies. Most Fairview's annual precipitation falls between November and January. Severe cold snaps, although rare, can last for several days. Snowfall in Fairview is uncommon and does not happen every winter.

¹ Personal communication with Mike Townsend, October 18, 2016.

Figure 2-1. Portland Climate Data²

2.4 Topography

The subject site is located within the US Geological Survey Camas, Washington Quadrangle at an elevation ranging from approximately 30 to 70 feet above mean sea level (Figure 1). The regional topography is dominated by historical river terraces, which slope downward (northward) toward the Columbia River located approximately one-mile north of the site. The subject site is located near the base of these terraces, which rise up more than 200 feet in elevation south of the site.

2.5 Cultural Setting

Most the site is zoned "GI: General Industrial" by the City of Fairview. This is defined as a broad range of light to heavy industrial development. A portion of the property, Tax Lot 10, is zoned CC: Corridor Commercial; this is defined as development of a full range of commercial and auto-oriented businesses.

Adjacent surrounding properties to the north (across UP right-of-way) are zoned GI, to the south the land is zoned GI and CC and to the west it is zoned residential (R/MH [manufactured homes] and R/MF/TOZ [apartments]) and CC. The area to the east of the subject site is Wood Village and under different zoning jurisdiction, but are similarly zoned commercial/industrial to the east and southeast of the subject site. A zoning map is presented in Figure 4.

² Source: <http://www.usclimatedata.com>

3.0 GEOLOGY

3.1 Regional Geologic Setting

Fairview is located south of the Columbia River in the central portion of the Portland Basin. The Portland Basin is a sub-basin of the Willamette Valley Basin, a topographic and structural trough between the Coast Range to the west and the Cascade Mountains to the east. The Coast Range is composed of uplifted Tertiary marine sedimentary rocks and related volcanic and intrusive rocks. The Cascade Range is an accumulation of volcanic lavas and debris erupted from continental volcanoes. Tertiary marine strata and older Cascade volcanic rocks interfinger at depth and form the bedrock foundation beneath the Willamette Valley³.

Portland Basin is largely filled with Tertiary-age fluvial and lacustrine sediments, including the Troutdale Formation and underlying Sandy River Mudstone, which sediments exceed thicknesses of 1,400 feet. The eastern basin has coarser grained sediments due to deposition of streams from the Cascade Mountains. Overlying these deposits are Quaternary-age terrace, glacio-fluvial, and floodplain alluvial sediments comprising the Troutdale Gravel, Blue Lake Gravel and Floodplain sand and silt³. Much of these younger sediments were deposited between 15,000 and 12,000 years ago, when Glacial Lake Missoula flood waters, as they exited the narrow mouth of the Columbia Gorge, reduced in velocity and deposited sand and gravel in the Portland Basin. These deposits grade to fine-grained silts as the waters flowed south through the Willamette Valley⁴.

Although there are some differences, the regional stratigraphy described in Oregon Department of Environmental Quality's (ODEQ's) *Remedial Action Record of Decision for the East Multnomah County Groundwater Contamination Site, Troutdale Sandstone Aquifer*³, located just a mile or so west, applies at the subject site. A brief summary is provided below:

Quaternary-age sediments such as the Troutdale Gravel, Blue Lake Gravel, and Floodplain sand and silt Deposits are not present across TFI's property but in other areas of the study area. In the area of the subject site, these units have been eroded. Below these Quaternary units is the upper most Siltstone Unit 1 (SU1), which contains sandstone, siltstone and clayey siltstone. This unit is present in some areas of the study area. Underlying this unit is the Troutdale Sandstone and below that is the Troutdale Conglomerate. Both of these units are present across the site. Underlying these units is the Siltstone Unit 2 (SU2) and consists of interbedded siltstone and sandstone. SU2 is present across most of the study area, but there are a few localized areas where it is

³ ODEQ, 1996. *Remedial Action Record of Decision for the East Multnomah County Groundwater Contamination Site, Troutdale Sandstone Aquifer*. Oregon Department of Environmental Quality Waste Management & Cleanup Division, dated December 1996.

⁴ Conlon, Terrence D., Karl C. Wozniak, et.al., 2005. *Ground-Water Hydrology of the Willamette Basin*, Oregon, U.S. Geological Survey Scientific Investigations Report 2005-5168.

missing. The lower portion of the Troutdale Formation below the SU2 consists of sandstone and conglomerate. The Sandy River Mudstone is present at some depth below the basal Troutdale Sandstone and Conglomerate, but is not identified in wells evaluated for this EDB report.

The Troutdale Formation has been influenced by structural deformation in the form of folding and potential faulting, along with erosion. Folding has resulted in an upward folding which creates a “structural high”. This structural high is centered in the vicinity of the intersection of Sandy Boulevard and 201st Avenue. Deformed Troutdale Formation strata slope down and away from the center of the structural high, and generally increase in thickness to the west and south. In and near the structural high, the Troutdale Gravel and SU1 have been removed by erosion, leaving the Troutdale Sandstone at the surface, covered by only a thin veneer of modern Floodplain silt. The edges of where the Troutdale Gravel and SU1 are not present are referred to as the “truncation” of the Troutdale Gravel and the SU1.

The area between Blue Lake and the south shore of the Columbia River, additional erosion and suspected faulting of the Troutdale Formation has occurred. A deep channel of the Columbia River has incised the Troutdale Formation. The channel has been subsequently filled with gravel referred to as the Blue Lake Gravel. Incision of this channel, and the subsequent filling with gravel, is presumed to have occurred with the erosion of the Troutdale Formation near the structural high.

3.2 Site Geology

GeoDesign, Inc. (GDI)⁵ describes surface soil as “sandy silt with organics” down to 1.5 feet below ground surface (bgs). In the area, other reports have described subsurface conditions as a fine-grained silt and/or sandy silt over silty, sandy gravels. Sampling and subsurface exploration has been limited onsite to just the top couple of feet, strictly in the fine-grained soils. Sandstone cobbles have been identified at the surface of the subject site, which suggests that the Troutdale Sandstone unit of the Troutdale Formation is exposed in the site area. The Troutdale Conglomerate underlies the Troutdale Sandstone

4.0 HYDROGEOLOGY

4.1 Surface Water in the Immediate Vicinity of the Subject Property

There are no lakes, creeks, springs, or wetlands features on the subject property; however, an unnamed storm water retention pond is in the extreme northeast corner of the subject site. The pond is relatively small and does not appear to have any effect on the local ground water. There is a smaller depression that collects storm water near the southeast corner of Lot 6. The Columbia

⁵ GeoDesign, 2009. Focused Remedial Investigation Report, Human Health and Ecological Risk Assessment, Townsend Farms Business Park, 23303 NE Sandy Boulevard, Fairview, Oregon, For Oregon Department of Environmental Quality, September 22, 2009.

River is located approximately (1) mile north of the site and Fairview Lake approximately ¼ mile to the northwest of the site.

4.2 Site Hydrostratigraphic Units

Shallow, intermediate, and deep ground-water bearing units (aquifers) separated by lower permeability, less transmissive strata (confining units) are described for the area of the subject site through work by others^{6,3}.

The aquifer units include from top to bottom: Upper Gravel Aquifer (UGA), Troutdale Gravel Aquifer (TGA), Confining Unit 1 (CU1), Troutdale Sandstone Aquifer (TSA), Confining Unit 2 (CU2), Sand and Gravel Aquifer (SGA). Those stratigraphic units believed to be present beneath the site are shown on the geologic cross-sections in Figure 5 (SW to NE) and Figure 6 (SE to NW), which were prepared based on our knowledge of the site, lithologic descriptions found on site and vicinity water supply well logs, and geologic maps and cross sections provided in ODEQ's *Remedial Action Record of Decision for the East Multnomah County Groundwater Contamination Site, Troutdale Sandstone Aquifer*³. Well locations and lines of cross sections are shown on Figure 7. A brief description of each aquifer is included below:

Upper Gravel Aquifer (UGA). This unit is absent in the immediate vicinity of the site, but it is present in the hillside to the southwest.

Troutdale Gravel Aquifer (TGA). This unit is present throughout most of the Portland Basin though absent in the immediate vicinity of the site. The TGA appears to have been eroded away in the area of the subject site, since it is present on sites to the south and then appears to truncate at the edge of the floodplain, at the bottom of a steep slope just south of the subject site.

This unit is described as a poorly to moderately cemented conglomerate or sandy conglomerate and includes thick local accumulations of lavas and a mantling soil horizon. Ground-water flow in this unit is toward the north and the point of truncation. Where ground water exits the unit, it can 1) discharge to springs, 2) flows underground along the top of CU1, and 3) vertical leakage downward through CU1 into the TSA⁶.

Confining Unit 1 (CU1). CU1 is present throughout most of the area but appears to thin toward the north and truncate with the TGA. CU1 consists of a medium to fine-grained arkosic sand, silt and clay with some vitric sand beds⁵. It has a very low hydraulic conductivity (10^{-6} to 10^{-4} feet per day) limiting vertical flow and in many areas confines the TSA. As CU1 thins to the north, these hydraulic conductivities increase as a result of the weathering and thinning of the CU1 unit, allowing some vertical leakage of the TGA ground water downward to the TSA through the CU1.

⁶ McFarland, William D. and David S. Morgan, 1996. Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington, US Geological Survey Water-Supply Paper 2470-A, 58 pgs, and plates.

Troutdale Sandstone Aquifer (TSA). The TSA is under the entire project area and composed of two subunits: the upper two-thirds is mainly a vitric sandstone, and the lower third is conglomerate. The upper sandstone unit is moderately to well-sorted angular to sub-rounded coarse sand of black to dark-brown olivine basalt glass and dark-gray olivine basalt. Lenses of sandy silt and clay are interbedded with the sandstone. The lower conglomerate consists of quartzite-bearing basalt conglomerate with a matrix of vitric sand and micaceous lithic arkose⁶. The average thickness of the TSA subunits in the area of the site is approximately 70 feet of sandstone and 200 feet of conglomerate³.

The hydraulic conductivity of the entire saturated thickness of the TSA is estimated to range from 30 to 90 feet per day with an average of 50 feet per day⁵. Primary sources of recharge for the TSA include upgradient regional ground-water flow, direct infiltration of precipitation where the TGA and CU1 are absent, ground water flow from the SGA (below) in areas where CU2 is more permeable and an upward gradient exists, spring flow and discharge from the TGA and CU1 erosional truncation, and possibly irrigation⁶.

Confining Unit 2 (CU2). This unit separates the TSA from the SGA and is likely present beneath the site as shown on the geologic cross-section on Figure 6. Where the CU2 is present, it is primarily a grayish olive-green clay and silt with lenses of silt and fine to medium-grained basaltic sand. It is approximately 50 feet thick or as much as 100 feet in the Columbia River Flood Plain. The vertical hydraulic conductivity is estimate to be very low, in the range of 10^{-6} to 10^{-4} feet per day, where the unit has significant thickness. This unit limits vertical movement and partially confines the SGA.

Sand and Gravel Aquifer (SGA). This unit is 400 to 800 feet thick in the area and consists of a sandy gravel, silty sand, sand and clay⁶. Near the Portland wellfield, the upper subunit is predominantly coarse and the lower portion is fine-grained. The hydraulic conductivity of the SGA is similar to that of the TSA.

4.3 Summary - Conceptual Hydrogeologic Model

The subject property is in the Columbia River flood plain of the Portland Basin⁶. The Columbia River is approximately one (1) mile north of the site. Approximately 1.7 miles northeast of the subject site, the Sandy River, which drains a portion of the Oregon Cascade Range, discharges to the Columbia River at Troutdale between river mile 120 and 121. Nearly 18 miles west-northwest of the subject site, the Willamette River, which drains the Willamette Valley from a position southeast of Eugene/Springfield at (river mile 198) to Portland, discharges to the Columbia River downstream of the Sandy River at river mile 101. A series of sloughs and lakes comprising the Columbia Slough drains 18 miles of lowlands on the south shore of the Columbia River from Fairview Lake / Blue Lake, located just northwest of the subject site, to the mouth of the Willamette River. The Columbia Slough is divided into three reaches (Lower, Middle and Upper), and along with a series of levees and pumping stations is used for flood control of the

Columbia River Lowlands. The Upper Slough originates at the west end of Fairview Lake, approximately 1.2 miles west-northwest of the subject site.

Regional ground water flow from up-gradient sources (recharge areas) to the south and east is the principal source of ground water recharge for the TSA, in which the local supply wells (Townsend Well, City of Fairview [CoF] wells, and City of Wood Village [CWV] wells) appear to be screened. Where the TGA and CU1 have been eroded away, precipitation is also a source of recharge of the TSA – believed to be minor in comparison to regional flow. Although some of the precipitation evaporates, becomes storm water, or becomes biologic uptake and returns to the atmosphere by transpiration, a portion of precipitation penetrates into the ground surface where it eventually percolates down to the TSA. It has not been determined for this study if additional recharge of the TSA in the site area occurs from the underlying SGA. Also, not determined is the extent to which spring flow and irrigation contribute to recharge of the TSA in the site area.

Regional ground water flow in the TSA is northeastward⁶, where not modified by larger pumping wells, to ground water discharge areas along the Columbia Slough and Fairview Lake. A northeastward flow direction is manifest by the southwest-tailing time of travel (capture) curves modeled for CoF wells shown on Figure 8. TFI's well captures a relatively small area (only the southeast corner of the subject site) in comparison to the areas captured by CoF and City of Wood Village's wells. More will be said about time of travel curves in Section 4.4.3.

4.4 Water Well Records

4.4.1 Oregon Water Resources Department (OWRD) GRID Database

The OWRD maintains the GRID (Ground Water Information Database) consisting of logs for borings and wells in the State. The following should be noted regarding the logs within the database:

1. Over the years the well report form has changed several times, and the filing of well logs has only been required since 1955.
2. Older wells are frequently undocumented.
3. Well logs are completed and filed by well drillers and well locations are commonly poorly described.
4. Older wells have the names of the original property owners which are not updated with changes of title.
5. Drillers also have no training in materials descriptions, and the lithologies described in the well logs should be considered carefully during review.

4.4.2 Site and Vicinity Water Supply Wells

Wells occurring at and near the subject site were identified by searching OWRD's GRID database in Sections 22, 23, 27 and 28 of Township 1 N, Range 3E of the Willamette Meridian. Our search identified the following water supply wells *pertinent to this study*:

Ethylene Dibromide in Ground Water Occurrence, Hydrogeology and Possible Sources

Townsend Farms

- One (1) active and three (3) abandoned on-site (TFI) wells. Additionally, there is a piezometer in the southern portion of the TFI site (MULT8281).
- Three (3) active, two (2) emergency and one (1) abandoned CoF wells.
- One (1) active City of Wood Village (CWV) well.
- One (1) Fairview Farms (FF) well (pumping status unknown).

This is not an exhaustive list of wells in the search area, as there are numerous water supply wells occurring along the south bank of the Columbia River in East Portland, Gresham, Fairview, Wood Village and Troutdale.

Approximate TFI well locations are shown on Figure 2, and TFI, CoF, CWV, and FF wells are shown on Figure 7. Logs of these wells are included in Attachment A. Selected water supply well data from the well logs are summarized in Table 4-1 below.

Table 4-1. Water Supply Well Construction Summary

Name	Year Installed / Abandoned	Well Log ID / Well # / (Date Installed)	Total Depth (ft) / Diam. (in)	Depth Screened (ft)	Probable Aquifer Screened	First Water Depth (ft)	Static Water Level (ft)	Well Status
Townsend Farms	1939 / ~2003	MULT 1359 Well #1	76 / 6	Not Indicated	TSA sandstone	Not Indicated	25	Inactive (abandoned)
	Not indicated / 2003	MULT 70541 Well #2	136 / 8	Not Indicated	TSA conglomerate	Not Indicated	62	Inactive (abandoned)
	2001	MULT 63478 Well #3	260 / 8	205-245	TSA conglomerate	205	57	Active
	1952 / ~2003	MULT 1009	238 / 8, 5	141-238	TSA	Not Indicated	31	Inactive (abandoned)
	2006	MULT 82081	25 / 1	5-20	TSA	Not Indicated	5	Active (piezometer)
City of Fairview	1956 / 2011	MULT 1363/64 Well #3	1060 / 12, 10	275-340	TSA conglomerate	10	90	Inactive (abandoned)
	1973	MULT 1368 Well #5	360 / 16	270-290, 330-340, 341-355	TSA conglomerate	98	96	Active
	1992	MULT 3104 Well #6	322 / 10	201-216, 236-256, 265-301	TSA conglomerate	28	102	Inactive (Emergency)
	1997	MULT 53960 Well #7	380 / 12, 8	253-258, 268-328, 342-353	TSA conglomerate	95	154	Inactive (Emergency)
	2002	MULT 66769 Well #8	420 / 20	219-395, 395-400, 400-420	TSA conglomerate	28.3	28.3	Active
	2010	MULT 102164 Well #9	580 / 20, 18, 12	313-364, 372-382, 396-400, 422-443, 463-476, 486-505, 512/527, 553-557, 563-569	TSA conglomerate SGA	Not Indicated	111	Active
City of Wood Village	1970	MULT 1431 Well #2	458 / 12	439-449	SGA	Not Indicated	250	Active
	1980	MULT 2418 Well #3	300 / 12	200-230, 245-255, 270-280	TSA conglomerate	15	98	Active
Fairview Farms	1943	MULT 1318 Well #4	281 / 24, 12, 8	237-250	SGA	Not Indicated	NA	Unknown

4.4.3 Ground Water Capture and Time of Travel Curves

Figure 8 includes ground water capture and time of travel (TOT) curves from ODEQ's Facility Profiler for TFI's large supply well, CoF's five (5) existing water supply wells, and two (2) of CWV's

four (4) water supply wells. One-, two-, five- and ten-year time of travel lines are indicated. The outer curve for each well represents the approximate capture zone, and hence, ground-water protection area designated for each supply well. It is assumed that these capture/ground-water protection zones are conservative with respect to actual conditions.

An examination of this figure indicates that there are some overlapping capture zones, suggesting supply wells compete for ground water in these overlapping areas. Therefore, at any location in these competing areas, a particle of ground water can ultimately be captured by only one well, the well having the strongest gradient.

- CWV Well #3 and TFI's well overlap.
- CWV Well #3 and CoF wells #5, #6, #8 and #9 overlap.
- CoF wells #5, #6, #7, and #9 overlap.
- CWV Village Well #2 and CoF Well #6 overlap.

Conversely, capture zones that do not overlap do not compete for ground water. Therefore, a well would not be expected to capture ground water, plus any associated impacts, that are downgradient of its capture zone. However, a well could capture ground water contaminants from an up-gradient source whose contaminant plume migrates through the capture zone of the well in question.

4.4.4 Wells in Geologic Cross Sections

The relative elevations of well screens or perforations for the TFI well, four (4) CoF wells, a CWV well, and a FF well are shown on the geologic cross section A-A' in Figure 5 and B-B' in Figure 6. Static ground-water levels, where indicated, are also illustrated on both cross sections. The lines of section and associated wells are shown on Figure 7. A tabulated summary of water supply well data, for the logs comprising the geologic cross sections, is provided in Table 4-1 (see Section 4.4.2). The following observations are noteworthy for this study:

- TFI's well and CoF Well #6 are both screened in the lower TSA (conglomerate) aquifer; The portion of the TSA that COF Well #6 is screened within appears to be confined by CU1. Based on ground-water elevations (although different dates) in TFI's well and CoF wells #6, # 7 and #9, the ground-water flow direction appears to be northeastward, in line with topography. This explains why CoF wells have a south-southwestward up-gradient capture area and why TFI's well capture area does not overlap CoF Well #6.
- The portion of the TSA that CoF Well #3, Well #7 and Well #9 are screened within is also confined by CU1.
- CWV Well #3 is also screened in the lower TSA conglomerate, which is confined by CU1 in this area. The static water level in CWV #3 is relatively lower in elevation than TFI's well. Unlike CoF Well #6, CWV Well #3 has a broad northwestward capture area instead of a narrow south-southwestward capture area. Furthermore, CWV Well #3's capture area

overlays TFI's well capture area and portions of CoF Well #3, Well #5, Well #6, Well #8 and Well #9 capture areas.

- FF Well #4 appears to be screened in the SGA, which is stratigraphically below the TSA conglomerate and CU2. Consequently, one would not expect communication between this well and TFI's well.

4.4.5 Review of OWRD's Water Rights, Permits and Claims

The waters of Oregon collectively belong to the public and cannot be owned by any one individual or group. Instead, individuals or groups may be granted rights to use them. A water right is a legal authorization to use a predefined quantity of public water for a designated purpose. Any use of surface water (e.g., lakes, ponds, rivers, streams, or springs) and any use of ground water require a water-right permit or certificate.

Oregon Water Law exempts the following ground water uses from permitting and water rights regulations:

1. Stock watering.
2. Lawn or noncommercial garden: watering of not more than one-half acre in area.
3. Single or group domestic purposes: not exceeding 15,000 gallons per day.
4. Single industrial or commercial purposes: not exceeding 5,000 gallons per day.
5. Down-hole heat exchange uses.
6. Watering school grounds: ten acres or less, of schools located within a critical ground water area.

There are two (2) water rights associated with the Townsend property and they are described below. TFI's wells are shown on Figure 2.

Permit GR3339 (Certificate GR3093, Well MULT 1359) was granted to William and Florence Townsend in 1959 for dairy and irrigation of approximately 22 acres from a 6-inch diameter well completed in 1939. The well is registered as MULT 1359, drilled to a depth of 76 feet bgs but cased to just 60 feet bgs. The well is perforated, but there is no indication of the interval of these perforations. TFI reported that this well was abandoned; however, TFI retains this water right and uses it with active well MULT 63478 that supplies water for its fruit packaging plant, offices, and other on-site facilities.

Permit GR301 (Certificate GR280, Well MULT 1009) was granted to Alvin Kaser in 1956 for a single well installed in 1952 to be used for irrigation of approximately 54 acres of row crops. This well is registered as MULT 1009, drilled to a total depth of 238 feet bgs, cased with 8-inch casing to 141 feet and 5-inch casing from 141 to 238 feet bgs. It is perforated from 141 to 238 feet, in a sand and gravel layer. This well is located on the western portion of TFI's property near NE 230th Avenue, and it was abandoned when NE 230th Avenue was constructed.

5.0 ETHYLENE DIBROMIDE (EDB)

5.1 Chemical Uses

EDB has been used as an agricultural fumigant and as a gasoline additive for automobile engines. Additionally, it was used as a solvent for resins, gums, waxes, waterproofing, dyes, pharmaceuticals and as a fumigant for nematode infestation in crops. EDB was registered as a pesticide as early as 1948 and was used as a soil fumigant, to control nematodes prior to planting crops such as citrus, potatoes, cotton, peanuts as well as over 30 additional fruit and vegetable crops such as red raspberries. EDB was banned from use by the US Environmental Protection Agency (EPA) in 1983⁷ when it was found to be a carcinogen in animals. TFI stated that they never used EDB on lands under their management, and further stated that pesticide use altogether ceased in 1982.

5.2 Cleanup Standards

5.2.1 Risk-Based Decision Making

Risk-based cleanup standards are based on ODEQ's *Risk-Based Decision Making for the Remediation of Petroleum Contaminated Sites* (RBDM) guidance document. The risk-based concentrations (RBCs) were most recently updated through November 2015. The most conservative risk-based concentrations were used as screening level risk-based concentrations (SLRBCs) on the tables in the Attachments that follow the text. The SLRBC for EDB is 0.0075 µg/L, which is the ingestion and inhalation from tapwater RBC for a residential receptor.

5.2.2 Maximum Contaminant Levels

National Primary Drinking Water Regulations (NPDWR) have been promulgated by the EPA to protect public health by limiting contaminants in drinking water from public water supply systems. Maximum Contaminant Levels (MCLs) are legally enforceable standards, which is defined as the highest level of a contaminant that is allowed in drinking water. Using the best available treatment technology and cost, MCLs are set as close as feasible to Maximum Contaminant Level Goals (MCLGs), which are the level of a contaminant in drinking water below which there is no known or expected risk to health⁸. The MCLG for EDB is zero, and the MCL for EDB is 0.05 µg/L.

5.3 Current Understanding of Extent of Impacts at the Site

5.3.1 Rapid Soil Solutions, Letter Report dated August 26, 2015

Rapid Soil Solutions (RSS) conducted soil and water sampling on Lot 11 (5 acres) of the Townsend property on August 18, 2016, in response to elevated EDB detections in samples from

⁷ EPA, 1983. EPA Acts to Ban EDB Pesticide, September 30, 1983 news release.

⁸ EPA, Ground Water and Drinking Water, Table of Regulated Drinking Water Contaminants: <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants#content>

TFI's water supply well (MULT 63478) and CoF well #6 (MULT 3104)⁹. RSS sampled soil at six (6) locations at depths ranging from 2 to 6 feet bgs, and the water from TFI's well (MULT 63478). EDB was not detected in any of the soils or in the well water sample. RSS argued that since ground water flow (in the TSA) was toward the north, any EDB detected in CoF Well #6 had to originate from a source hydraulically up-gradient (south) of Well #6. Thus, it is very improbable that EDB originated from a source at Townsend Farms that is hydraulically downgradient and outside of the modeled capture area for CoF Well #6 shown on ODEQ's Facility Profiler (Figure 7). Clearly, EDB detected in TFI's well also had to originate from a hydraulically up-gradient source. RSS presented ground water elevation data that supported this theory.

ENW agrees with RSS' theory, which we believe is supported by the local hydrogeology, historical land use and comprehensive set of water supply well data found in TFI's files, as well as Oregon Public Health Authority's Drinking Water Data Online database¹⁰.

5.3.2 Extent of EDB in Ground Water

This section presents our current understanding of ground water impacts in the area of the subject site based on the results of available EDB analyses of water samples collected from the wells in the vicinity of the subject site. EDB data are publicly available through Oregon Health Authority's (OHA's) Drinking Water Data Online database¹⁰ for most wells included in the cross sections on Figures 5 and 6 (attached). Table 5-1 below presents a summary of pertinent water supply well data that are useful for the discussion presented in this section. Water supply sampling EDB data are presented in Table 1, and selected data are charted on Figure 9 (attached after text).

⁹ Rapid Soil Solutions, 2015. Letter Report to Townsend Farms, Kerry Rea, Re: Townsend Farms – EDB Addendum lot 11, and well head at south entrance, dated August 26, 2015.

¹⁰ <https://yourwater.oregon.gov/inventory.php?pwsno=94866>

Table 5-1. Water Supply Well EDB Data Summary

Name	PWS ID	Well Log ID / Well # / (Date Installed)	Well Status	EDB Data Date Range	EDB Detected (Y/N)	Date 1 st Detect	Date Last Detect	No. Detect / No. Samples / No. In Data Set	Mean EDB Conc. (µg/L)	Max. EDB Conc. (µg/L)
TFI	94866	MULT 1359 Well #1 (1939)	Inactive (abandoned)	Not Sampled	Not Analyzed	---	---	0/0/93	---	---
		MULT 70541 Well #2	Inactive (abandoned)	1994-1999	Y	10/5/94	2/21/95	2/4/93	0.04	0.05
		MULT 63478 Well #3 (2001)	Active	2001-2016	Y	11/30/10	8/10/16	18/37/93	0.039	0.12
	Not in database	MULT 1009 (1952)	Inactive (abandoned)	Not Sampled	Not Analyzed	---	---	0/0/93	---	---
		MULT 82081 (2006)	Active (piezometer)	Not Sampled	Not Analyzed	---	---	0/0/93	---	---
City of Fairview	00296	MULT 1363/64 Well #3 (1956)	Inactive (abandoned)	1996-2008	N	---	---	0/12/93	---	---
		MULT 1368 Well #5 (1973)	Active	1996-2015	Y	12/27/05	10/16/13	4/22/93	0.0135	0.02
		MULT 3104 Well #6 (1992)	Inactive (Emergency)	1993-2011	Y	12/27/05	10/31/11	14/27/93	0.0496	0.0772
		MULT 53960 Well #7 (1997)	Inactive (Emergency)	2001-2003	N	---	---	0/2/93	---	---
		MULT 66769 Well #8 (2002)	Active	2003-2014	N	---	---	0/8/93	---	---
		MULT 102164 Well #9 (2010)	Active	2011-2015	Y	10/16/13	10/16/13	1/6/93	0.02	0.02
City of Wood Village	00904	MULT 2418 Well #3 (1980)	Active	1993-2016	N	---	---	0/12/93	---	---
Fairview Farms	Not in database	MULT 1318 Well #4 (1943)	Unknown	None	Not Analyzed	---	---	0/0/93	---	---

The following summary points are based on our analysis of the EDB data summarized in Table 1 (attached after text), Table 5-1 above, and Figure 9¹¹ (attached after text):

- Wells EDB Detections** - EDB has been detected in former TFI Well #2 (MULT 70541, two detections) and current TFI Well #3 (MULT 63478, 18 detections); and CoF Well #5 (MULT 1368, four detections), Well #6 (MULT 3104, 14 detections) and Well #9 (MULT 102164, one detection). EDB has not been detected in CWV Well #3. FF Well #4 (MULT 1318) is not included in OHA's Drinking Water Data Online database.

¹¹ Note that non-detects were all lowered to 0.001 µg/L to provide a greater contrast between detects and non-detects.

Incidentally, ENW did not identify any other water supply wells proximal to the subject site in Fairview, Wood Village, Troutdale, Gresham or East Portland listed in the database that had detections of EDB in water samples.

- **TFI Well #2 (MULT 70541):** EDB was detected in TFI's Well #2 at a concentration of 0.05 µg/L, the first time the well was sampled on October 5, 1994. EDB was detected at a concentration of 0.02 µg/L, the second time the well was sampled on February 21, 1995. EDB was not detected in TFI Well #2 when it was sampled in June 1998 and June 2001. TFI abandoned this well sometime after installing Well #3 in March 2001. TFI Well #2 was abandoned after Well #3 was brought on line. It should be noted that these detections are at or below the method reporting limits for sampling events for other wells in the area. Since the raw analytical data was not reviewed, it is not possible to determine if these detections were at or below a reported method reporting limit, which would suggest the reliability of this data.
- **TFI Well #3 (MULT 63478):** EDB was detected in TFI Well #3 at a concentration of 0.102 µg/L, on November 30, 2010, nearly ten years after the well was installed. This was the maximum concentration of EDB detected to date in TFI Well #3, and this concentration is greater than maximum EDB detections in CoF wells #5, #6 and #9. This does not necessarily mean that the source area is at the subject site, but rather, the site may be in a more of a direct line than CoF wells to the source area as will be discussed later. There have been at least 17 additional EDB detections in TFI Well #3.
- **CoF Well #5 (MULT 1368):** EDB was not detected in CoF Well #5 during the first three sampling events on June 6, 1996, December 14, 1999, and April 25, 2002. EDB was first detected in this well at a concentration of 0.0103 µg/L on December 27, 2005. Up to three (3) additional detections followed, with the last of 0.02 µg/L (maximum detected concentration) occurring on October 16, 2013. EDB has not been detected in Well #5 during the three (3) subsequent sampling events, with the last occurring on October 14, 2015).
- **City of Fairview Well #6 (MULT 3104):** Like CoF Well #5, EDB was first detected in CoF Well #6 on December 27, 2005, at a concentration of 0.0772 µg/L, which is the maximum concentration detected to date in any of the three CoF wells, this well included. Thirteen (13) more detections followed, with the last occurring on October 31, 2011. This is the last reported time that Well #6 was sampled. Well #6 has presumably been inactive, since the last time it was sampled. The on-line database designates this well as emergency use.
- **City of Fairview Well #9 (MULT 102164):** CoF Well #5 and Well #9 were presumably sampled together, or their combined flow was sampled, since analytical results were reported for both Well #5 and Well #9. The only detection

was 0.02 µg/L on October 16, 2013. It is not known whether detected EDB is from Well #5 alone, Well #9 alone, or a combination of the two wells. For purposes of this report we assumed the latter, that EDB occurred in both wells at a mean concentration of 0.02 µg/L.

6.0 DISCUSSION

This discussion focuses on the timing, well locations, and magnitude of EDB detections, and what these three (3) parameters suggest about the potential source(s) of EDB in ground water. Prior to beginning this discussion, the following points must be considered:

- **Sampling frequency was not consistent in any one well or between wells.** Intervals ranged from three in a 24-hour period (e.g., CoF Well #6), weekly (e.g., CoF Well #6), monthly (e.g., TFI Well #3), bi-monthly (e.g., CoF Well #5), quarterly (e.g., CoF Well #6), and annually (CoF Well #5 and Well #9).
- During those periods when sampling frequency was consistent, **long periods of no detectable EDB** (up to 72 weeks in TFI Well #3 and 36 weeks in CoF Well #6) **were followed by long periods of detectable EDB** (up to 59 weeks in TFI Well #3 and 77 weeks in CoF Well #6).
- **EDB was first detected** in TFI Well #2 on October 5, 1994, and CoF Well #5 and Well #6 on December 27, 2005. However, sampling of CoF wells was quite infrequent up to this time, occurring on the average every three (3) years. Given there were long periods of no detectable EDB, it is probable that EDB would have been detected in CoF Well #5 and Well #6 prior to December 2005, had samples been collected on a more frequent schedule.
- **Pumping rates, fluctuations and periods of no pumping for all wells in the area are unknown.** Variations in pumping operations can affect the balance of capture zones and has the potential to change the course of a contaminant plume.

Figure 10 presents time series EDB plots for TFI Well #3 and CoF Well #6, which show variations in the magnitudes of detectable EDB interspersed with periods of non-detectable EDB, which produces the patterns of peaks and troughs. These patterns are influenced by various factors contributing to the fate and transport of dissolved EDB such as the timing of the EDB release, the chemical properties of EDB plus any associated carrier fluids, site environmental factors and sampling frequency. Additionally, this figure shows modeled detections of EDB in CoF Well #6, based on the following assumptions regarding data trends:

- 88-week duration of detectable EDB
- 43-week duration of non-detectable EDB
- 66-week average between the last EDB detection preceding a period of non-detects and first EDB detection following a period of non-detects
- 6-week average between the last EDB detection and first EDB non-detect
- A trend that matches CoF Well #6, excluding the non-detects in September 1993, June 1996 and December 1999.

A discussion of contaminant fate and transport is beyond the scope of this report, except to note that some of the factors are variable, while others are constant. The result is a unique pattern of peaks and troughs comprising each data set, which when compared with other data sets, may display some similarities in terms of correlatable peaks.

There is an observed similarity of EDB detects between CoF Well #6 (detected first) and TFI Well #3 (detected last) as shown in Table 6-1 below and in Figure 10:

Table 6-1. Similarity of EDB Detects CoF Well #6 and TFI Well #3

EDB Peak #	CoF Well #6	TFI Well #3	Weeks Apart	Years Apart
1	12/27/05	11/30/10	257	4.9
2	05/1/07	01/20/12	248	4.7
3	04/08/09	01/23/14	250	4.8
4	10/31/11	08/10/16	249	4.8

When a linear regression is performed on the data set from CoF Well #6 (April 25, 2002 through October 31, 2011) and TFI Well #3 (February 11, 2005 through April 23, 2015) a correlation coefficient of 0.520779, indicating moderate to strong correlation, is obtained.

These data suggest that CoF Well #6 intercepted this portion of the EDB plume approximately 5 years before TFI Well #3, or in other words, CoF Well #6 appears to be 5 years closer to the source and up-gradient of TFI Well #3.

The relatively greater concentration of EDB in TFI Well #3 than CoF Well #6 might be due to TFI Well #3 being more in line with the up-gradient source of EDB. Correspondingly, CoF Well #6 might be positioned further from the plume centerline than TFI Well #3, and CoF wells #5 and #9 might be positioned even further from the center of the plume than CoF Well #6. Alternatively, the City of Fairview wells are larger diameter (up to 20 inches), deeper (355 to 569 feet deep), and screened over multiple depth intervals (3 to 9) compared to TFI's 8-inch diameter by 260-foot-deep well screened from 141-238 feet below ground surface. However, TFI Well #3 and the CoF wells, or at least portions thereof, appear to be screened in the TSA Conglomerate. Therefore, based on well construction and multiple screening intervals, the lower detections in the CoF wells may be related to dilution within the CoF wells.

If the set of EDB detects in TFI Well #3 reflect the EDB detects in CoF Well #6, then there should be EDB detects in CoF Well #6 that correspond to the earliest EDB detects in TFI Well #2 as shown in Table 6-2 below:

**Table 6-2. Correlation of Earliest EDB Detects in TFI Well #2 / #3
to Modeled Detects in CoF Well #6**

TFI Well #2	Weeks Apart	CoF Well #6
10/05/94	251	12/25/89
02/21/95	251	05/03/90

These predicted dates in CoF Well #6 predate the earliest sample date of September 2, 1993 by 3 to 4 years. However, the CoF Well #6 model overlain on the chart in Figure 10 predicts EDB detections in this well during the time periods in question. Furthermore, this model also provides an explanation for the absence of EDB detections during the last four samplings in CoF Well #6 from September 24, 2002 through November 25, 2003. As explained, the sampling frequency of nearly 3 years may have been too infrequent to detect EDB recurrence for the period indicated.

7.0 SUMMARY AND CONCLUSIONS

Initially on October 5, 1994, EDB was detected in TFI Well #2, a 136-foot deep well located southwest of TFI's packing plant and used for the plant's water supply. The detected EDB concentration equaled the EPA's MCL of 0.05 µg/L. CoF Well #6 was also being monitored at this time, but EDB was not detected in CoF Well #5 and Well #6 until 11 years later on December 27, 2005, which prompted increased sampling frequency and a search for a possible source of EDB.

Four years earlier in 2001, TFI installed a larger diameter 260-foot-deep water supply well (TFI Well #3) and abandoned TFI Well #2. Nine years passed before EDB was first detected in TFI Well #3 on November 30, 2010. There have been 18 additional detections of EDB in TFI Well #3, six of which exceeded the MCL. August 28, 2015 was the last time EDB exceeded the MCL in TFI Well #3, and EDB was last detected in TFI Well #3 in August 2016.

Following the initial detection in December 2005, CoF Well #6 had 13 additional EDB detections, five of which exceeded the MCL. The last EDB detection was on October 31, 2011. Evidently, CoF Well #6 was not used after this time. CoF Well #5 had two additional detections, both of which were less than the MCL. Three years later on October 16, 2013, low-level EDB was detected in CoF Well #5 /Well #9. This is the most recent EDB detection in a CoF well.

Data from both TFI wells and CoF wells indicate that long periods of no detectable EDB (up to 72 weeks in TFI Well #3 and 36 weeks in CoF Well #6) were followed by long periods of detectable EDB (up to 59 weeks in TFI Well #3 and 77 weeks in CoF Well #6).

The source(s) of EDB detected in TFI wells and CoF wells is not definitively known, although a release from an agricultural source seems to be logical over an industrial source given the predominantly agricultural land use of the area during most of the 20th century. Agricultural land use predominated through the early 1990s in the portion of Fairview captured by TFI and CoF wells.

However, a historical service station release should not be discounted since historical service stations are likely to have been present in areas up-gradient of both well locations.

As a treatment for nematodes, it was common practice for soil fumigants to be shanked into the ground in the fall prior to planting berry canes in the spring. This initial treatment was the only application needed to assure the canes had a good start. EDB was a nematicide used for this purpose; however, Telone or Telone II was the only nematicide TFI used, which do not contain EDB. TFI was not the only berry farm in the area. In 1970, larger tracts cultivated with berry canes were present to the south and east of TFI.

While screened in the same aquifer, TFI Well #3 is located north and east of CoF Well #6, at a hydraulically down-gradient and topographically lower elevation. TFI's current and former property holdings (i.e., Townsend Business Park), are therefore beyond the modeled capture area and outside of the wellhead protection area of CoF Well #6. Indeed, TFI Well #3 is beyond the capture area of all the CoF wells, except CoF Well #8 located to the northwest. Unlike most CoF wells, CWV Well #3 captures all of Townsend Business Park. Yet, neither CWV Well #3 nor CoF Well #8 have had detectable EDB throughout its monitoring history. As mentioned earlier, lower magnitude detections and/or non-detects in CoF wells could be a result of dilution, considering the larger diameter and multiple screening intervals of the CoF wells.

The detection of EDB in a TFI well 11 years prior to the detection in a CoF Well is not a function of the source being closer to TFI, but rather, it appears to be a function of too infrequent sampling of wells. Given there were long periods of no detectable EDB followed by long periods of detectable EDB, it is probable that EDB would have been detected in CoF Well #5 and Well #6 prior to December 2005, had samples been collected on a more frequent schedule. ENW's model of EDB detections in CoF Well #6 shows that there could have been periods of EDB detections between the recorded non-detects in September 1993 and June 1996, June 1996 and December 1999, and December 1999 and April 2002 (Figure 10).

More definitive yet, time series EDB plots for TFI Well #3 and CoF Well #6 show an observed similarity of EDB detects (peaks) between the two wells, which when correlated, indicate a moderate to strong correlation coefficient of 0.520779. The frequency of correlated peaks is remarkably similar and ranges from 248 to 257 weeks (~ 5 years) apart. These data suggest that CoF Well #6 intercepted this portion of the EDB plume approximately 5 years before TFI Well #3, or in other words, CoF Well #6 appears to be 5 years closer to the source and up-gradient of TFI Well #3. The relatively greater concentration of EDB in TFI Well #3 than CoF Well #6 might be due to TFI Well #3 being more in line with the up-gradient source of EDB or more likely, a factor of dilution in the larger diameter multi-screened interval CoF wells.

If the set of EDB detects in TFI Well #3 reflect the EDB detects in CoF Well #6, then there should be EDB detects in CoF Well #6 that correspond to the earliest EDB detects in TFI Well #2. Using a 251-week average separation of peaks, predicted EDB detection dates for CoF Well #6 of December 1989 and May 1990 (correspond to detection dates of October 1994 and February

1995, respectively, in TFI Well #2) were obtained for CoF Well #6. These predicted dates for CoF Well #6 predate the earliest sample date of September 2, 1993 by 3 to 4 years. However, the CoF Well #6 model overlain on the chart in Figure 10 predicts EDB detections in this well during the time periods in question. Furthermore, this model also provides an explanation for the absence of EDB detections during the last four samplings in CoF Well #6 from September 24, 2002 through November 25, 2003.

Therefore, ENW asserts that the EDB detections in the COF wells and TFI wells are likely from a source area up-gradient (south and east) of both sets of wells. Certainly, there are ample historical sources that are within the capture areas of CoF wells #5, #6 and #9, all up-gradient of Townsend Business Park.

Based on these facts, no further assessment of EDB in ground water is warranted at Townsend Business Park, as a more likely source is present up-gradient of this location that has resulted in impacts to both TFI and CoF wells.

8.0 LIMITATIONS

The scope of this report is limited to observations made during on-site work, interviews with knowledgeable sources, and review of readily available published and unpublished reports and literature. As a result, these conclusions are based on information supplied by others as well as interpretations by qualified parties.

The focus of this survey does not extend to the presence of the following conditions unless they were the express concerns of contacted personnel, report and literature authors or the work scope.

- Naturally-occurring toxic or hazardous substances in the subsurface soils, geology and water.
- Toxicity of substances common in current habitable environments, such as stored chemicals, products, building materials and consumables,
- Contaminants or contaminant concentrations that are not a concern now but may be under future regulatory standards.
- Unpredictable events that may occur after our site visit, such as illegal dumping or accidental spillage.

ENW have performed services for this project in accordance with our agreement and understanding with the Client. This document and the information contained herein have been prepared solely for the use of the Client.

ENW performed this study under a limited scope of services, per agreement. It is possible, despite the use of reasonable care and interpretation, that we may have failed to identify regulation violations related to the presence of hazardous substances other than those specifically mentioned at the closure site. We assume no responsibility for conditions that we did not

specifically evaluate or conditions that were not generally recognized as environmentally unacceptable at the time this report was prepared.

TABLE

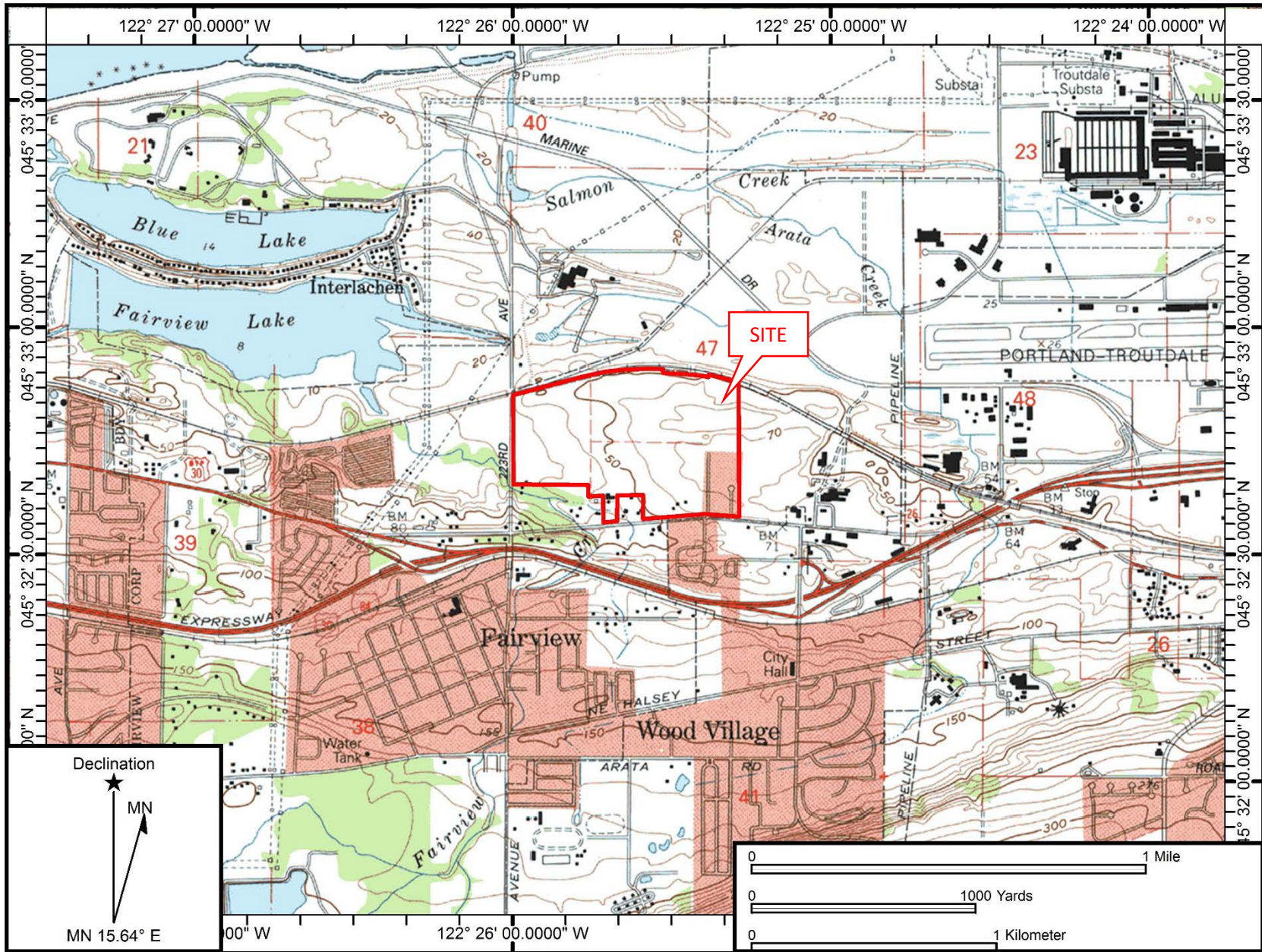
TABLE 1
Ethylene Dibromide Data
for Select Water Supply Wells
(µg/L)

Sample Date	Townsend Well #3 (MULT 63478)	Townsend Well #2 (MULT 1359)	Wood Village Well #3 (MULT 2418)	City of Fairview Well #6 (MULT3104)	City of Fairview Well #7 (MULT53960)	City of Fairview Well #8 (MULT 66769)	City of Fairview Well #5 and 9	City of Fairview Well #5 (MULT 1368)	City of Wood Village Well #3 (MULT 2418)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
4/1/1993	Not Present	---	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
9/2/1993	Not Present	---	---	<0.05 (ND)	---	---	---	---	---
10/5/1994	Not Present	0.050	---	---	---	---	---	---	---
2/21/1995	Not Present	0.020	---	---	---	---	---	---	---
6/6/1996	Not Present	---	---	<0.05 (ND)	---	---	---	<0.05 (ND)	---
9/26/1996	Not Present	---	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
6/23/1998	Not Present	<0.05 (ND)	---	---	---	---	---	---	---
12/14/1999	Not Present	---	---	<0.05 (ND)	<0.05 (ND)	---	---	<0.05 (ND)	---
10/4/2000	Not Present	---	<0.05 (ND)	---	---	---	---	---	---
10/23/2000	Not Present	---	---	---	---	---	---	---	<0.05 (ND)
6/7/2001	Not Present	<0.05 (ND)	---	---	---	---	---	---	---
9/14/2001	Not Present	---	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
4/25/2002	Not Present	---	---	<0.05 (ND)	---	---	---	<0.05 (ND)	---
5/9/2002	Not Present	---	---	---	---	---	---	---	---
9/4/2002	Not Present	---	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
12/4/2002	Not Present	---	---	---	<0.05 (ND)	---	---	---	---
11/12/2003	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
10/6/2004	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
2/11/2005	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
12/27/2005	---	Abandoned	---	0.0772	---	<0.05 (ND)	---	0.0103	---
5/31/2006	---	Abandoned	---	0.0599	---	---	---	<0.05 (ND)	---
3/19/2007	---	Abandoned	---	0.0398	---	---	---	<0.05 (ND)	---
3/19/2007	---	Abandoned	---	0.0492	---	---	---	<0.05 (ND)	---
3/19/2007	---	Abandoned	---	0.0512	---	---	---	<0.05 (ND)	---
5/1/2007	---	Abandoned	---	0.0598	---	---	---	<0.05 (ND)	---
6/5/2007	---	Abandoned	---	0.0468	---	---	---	---	---
6/21/2007	---	Abandoned	---	0.0519	---	---	---	---	---
6/28/2007	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
8/13/2007	---	Abandoned	---	<0.05 (ND)	---	---	---	<0.05 (ND)	---
9/25/2007	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
10/4/2007	---	Abandoned	---	<0.05 (ND)	---	---	---	<0.05 (ND)	---
9/9/2008	---	Abandoned	---	---	---	<0.05 (ND)	---	---	---
11/24/2008	---	Abandoned	---	---	---	<0.05 (ND)	---	---	---
1/22/2009	---	Abandoned	---	0.0427	---	---	---	---	---
1/22/2009	---	Abandoned	---	0.049	---	---	---	---	---
2/27/2009	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
4/8/2009	---	Abandoned	---	0.0506	---	---	---	---	---
7/21/2009	---	Abandoned	---	0.047	---	---	---	---	---
11/5/2009	---	Abandoned	---	0.0458	---	---	---	0.0129	---
1/26/2010	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
4/7/2010	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
4/7/2010	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
7/7/2010	---	Abandoned	---	<0.05 (ND)	---	---	---	---	---
7/20/2010	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
10/6/2010	---	Abandoned	---	<0.05 (ND)	---	---	---	<0.05 (ND)	---
11/30/2010	0.102	Abandoned	---	---	---	---	---	---	---
7/11/2011	0.052	Abandoned	---	---	---	---	---	---	---
7/20/2011	0.055	Abandoned	---	---	---	---	---	---	---

TABLE 1
Ethylene Dibromide Data
for Select Water Supply Wells
(µg/L)

Sample Date	Townsend Well #3 (MULT 63478)	Townsend Well #2 (MULT 1359)	Wood Village Well #3 (MULT 2418)	City of Fairview Well #6 (MULT3104)	City of Fairview Well #7 (MULT53960)	City of Fairview Well #8 (MULT 66769)	City of Fairview Well #5 and 9	City of Fairview Well #5 (MULT 1368)	City of Wood Village Well #3 (MULT 2418)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
7/29/2011	---	Abandoned	---	---	---	<0.05 (ND)	---	<0.05 (ND)	---
10/25/2011	0.060	Abandoned	---	---	---	---	---	---	---
10/31/2011	---	Abandoned	---	0.023	---	<0.05 (ND)	<0.05 (ND)	0.011	---
1/20/2012	0.120	Abandoned	---	---	---	---	---	---	---
6/1/2012	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
7/3/2012	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
8/2/2012	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
9/6/2012	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
10/3/2012	---	Abandoned	---	---	---	---	<0.05 (ND)	---	---
10/11/2012	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
11/14/2012	---	Abandoned	---	---	---	---	---	<0.05 (ND)	---
1/28/2013	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
4/9/2013	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
7/9/2013	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
7/23/2013	---	Abandoned	---	---	---	<0.05 (ND)	---	---	---
8/5/2013	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
10/16/2013	---	Abandoned	---	---	---	---	0.02	---	---
10/21/2013	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
1/23/2014	0.022	Abandoned	---	---	---	---	---	---	---
2/12/2014	0.022	Abandoned	---	---	---	---	---	---	---
2/25/2014	<0.019 (ND)	Abandoned	---	---	---	---	---	---	---
4/23/2014	<0.019 (ND)	Abandoned	---	---	---	---	---	---	---
7/22/2014	---	Abandoned	---	---	---	<0.05 (ND)	<0.05 (ND)	---	---
7/29/2014	<0.02 (ND)	Abandoned	---	---	---	---	---	---	---
10/15/2014	---	Abandoned	---	---	---	<0.05 (ND)	<0.05 (ND)	---	---
10/29/2014	<0.02 (ND)	Abandoned	---	---	---	---	---	---	---
1/29/2015	0.021	Abandoned	---	---	---	---	---	---	---
4/23/2015	0.036	Abandoned	---	---	---	---	---	---	---
7/30/2015	<0.0096 (ND)	Abandoned	---	---	---	---	---	---	---
8/28/2015	<0.0095 (ND)	Abandoned	---	---	---	---	---	---	---
9/9/2015	<0.0094 (ND)	Abandoned	---	---	---	---	---	---	---
10/14/2015	---	Abandoned	---	---	---	---	<0.05 (ND)	---	---
10/28/2015	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
11/3/2015	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
12/4/2015	<0.05 (ND)	Abandoned	---	---	---	---	---	---	---
1/9/2016	0.010	Abandoned	---	---	---	---	---	---	---
1/13/2016	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)
2/24/2016	0.015	Abandoned	---	---	---	---	---	---	---
3/16/2016	0.013	Abandoned	---	---	---	---	---	---	---
4/21/2016	0.013	Abandoned	---	---	---	---	---	---	---
5/20/2016	0.019	Abandoned	---	---	---	---	---	---	---
6/15/2016	0.023	Abandoned	---	---	---	---	---	---	---
7/13/2016	0.026	Abandoned	---	---	---	---	---	---	---
8/10/2016	0.028	Abandoned	---	---	---	---	---	---	---
8/17/2016	---	Abandoned	<0.05 (ND)	---	---	---	---	---	<0.05 (ND)

FIGURES



Date Published: 1993
 Map Name: CAMAS



Date Drawn: 11/30/2016
 CAD File Name: 1023-15001-01_fig1sv_map(v01)
 Drawn By: PMT
 Approved By: LDG

Townsend Business Park
 23303 NE Sandy Boulevard
 Fairview, Oregon

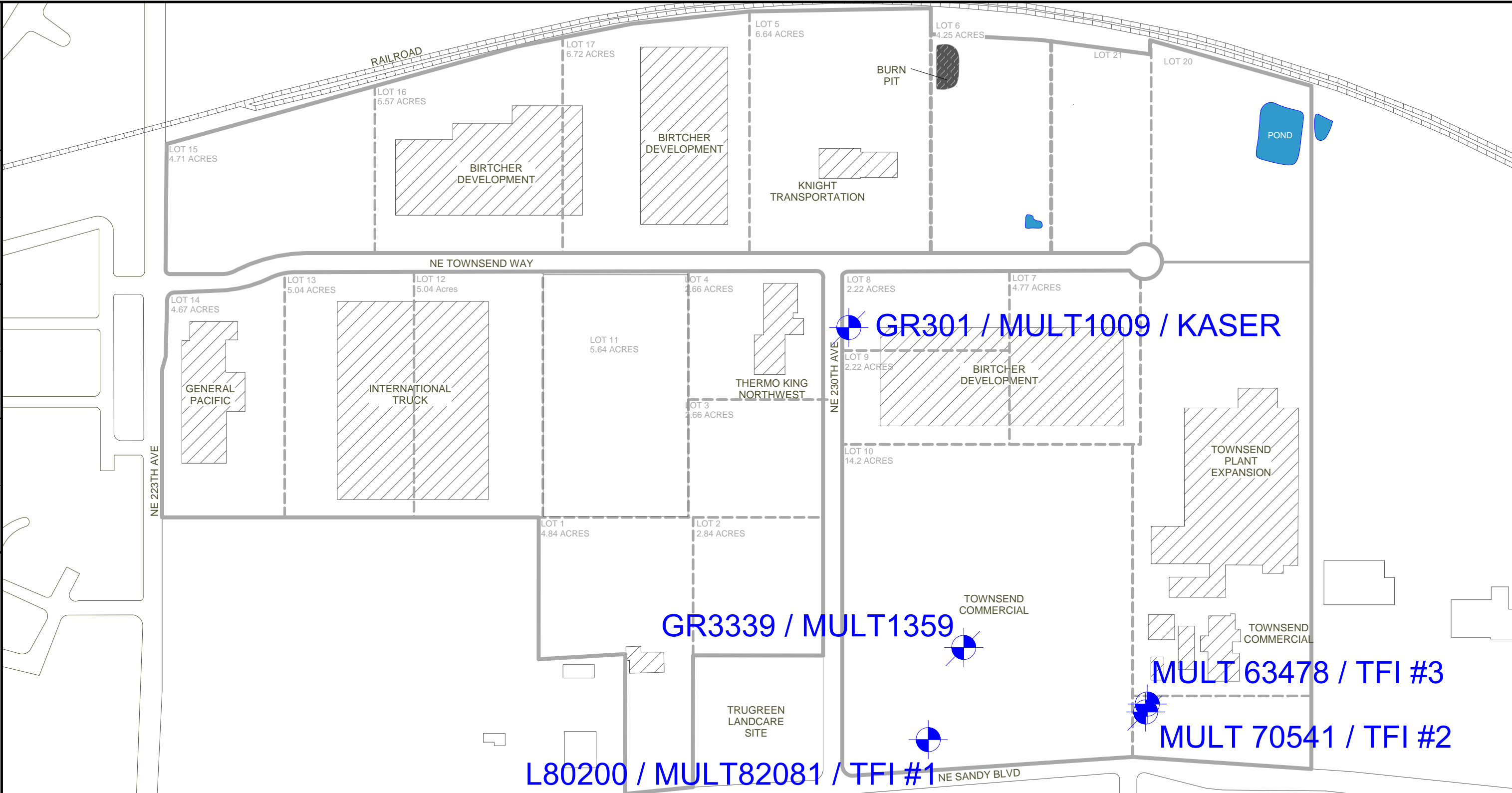
Site Vicinity Map

Project No.
 1023-15001-01






Figure No.

1

DRAWN BY J. BIGELOW 11/23/2015 P. TRONE 03/22/2016 L. GREEN 03/22/2016
 CHECKED BY
 APPROVED BY
 DRAWING NUMBER 1023-15001 (v01)






LEGEND:

	SUBJECT PROPERTY BOUNDARY		ABANDONED WATER SUPPLY / MONITORING WELLS / WELL ID
	LOT BOUNDARY		WATER SUPPLY / MONITORING WELLS / WELL ID
	SUBJECT BUILDINGS		BURN PIT
	BUILDING LOCATIONS		

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2015 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.

APPROXIMATE SCALE

environmental, natural resource consultants

PO BOX 14488, PORTLAND, OREGON 97293
 P: (503)452-5561, E: ENW@EVREN-NW.COM

FIGURE 2
SITE PLAN

TOWNSEND BUSINESS PARK
 23303 NE SANDY BOULEVARD
 FAIRVIEW, OREGON

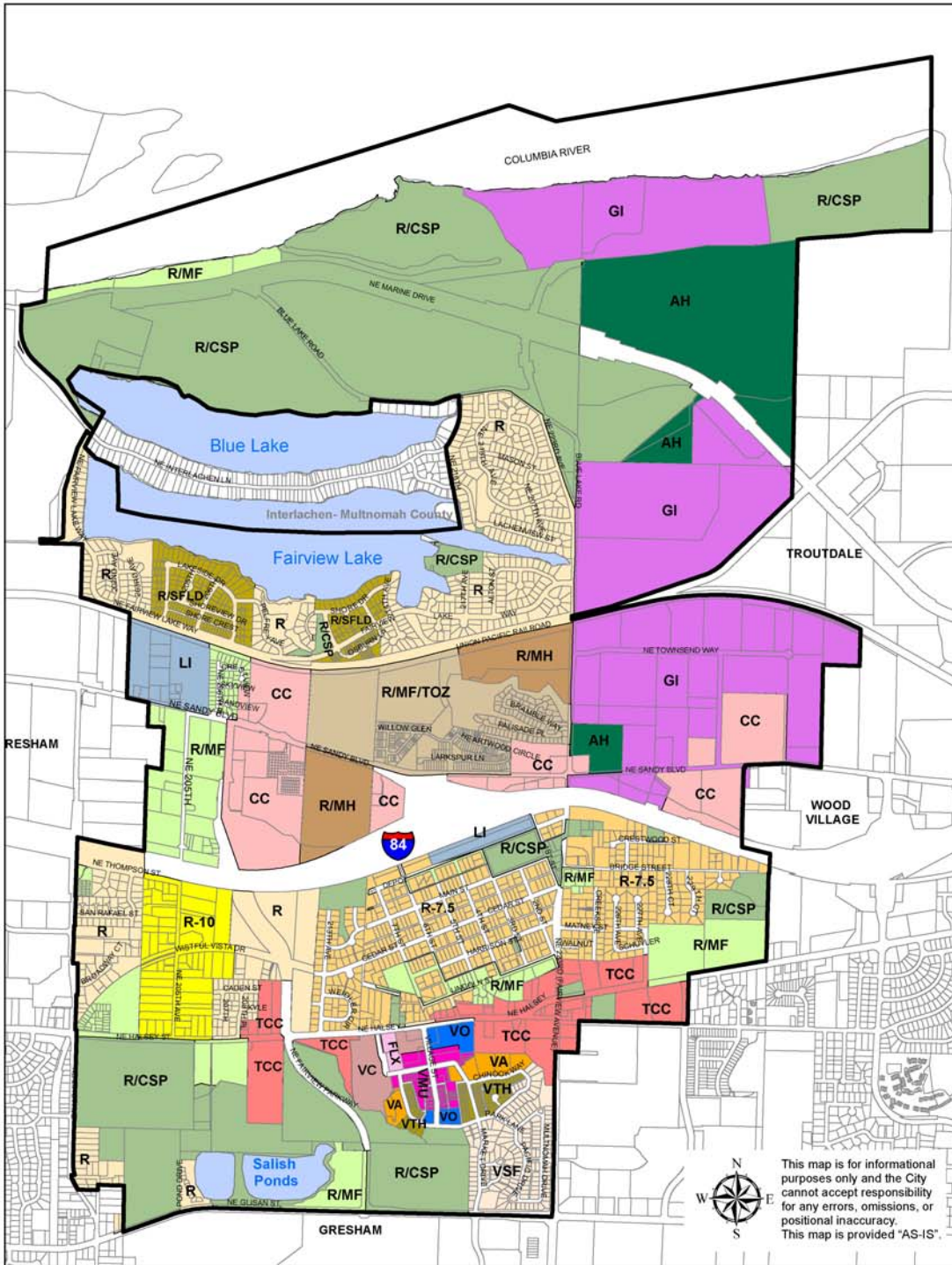


Date Drawn: 11/14/2016
 CAD File Name: 1023-15001-01-
 fig3_1970_Aerial(v01)
 Drawn By: JOB
 Approved By: LDG

Townsend Business Park
 23303 NE Sandy Boulevard
 Fairview, Oregon

**1970 Aerial Base
 Map**

Project No.
 1023-15001-02
 Figure No.
3



This map is for informational purposes only and the City cannot accept responsibility for any errors, omissions, or positional inaccuracy. This map is provided "AS-IS".

City of Fairview Zoning

- Agricultural Holding (AH)
- Residential (R)
- Village Commercial (VC)
- General Industrial (GI)
- Residential (R-10)
- Village Mixed Use (VMU)
- Light Industrial (LI)
- Residential (R-7.5)
- Village Flex (FLX)
- Town Center Commercial (TCC)
- Residential/ Manufactured Home (R/MH)
- Village Office (VO)
- Corridor Commercial (CC)
- Residential MultiFamily (R/MF)
- Village Apartments (VA)
- Res/MultiFamilyTownhouse Overlay (R/MF/TOZ)
- Village Townhouse (VTH)
- Res/ South Fairview Lake Design Overlay (R/SFLD)
- Village Single Family (VSF)
- Residential Community Service Parks (R/CSP)



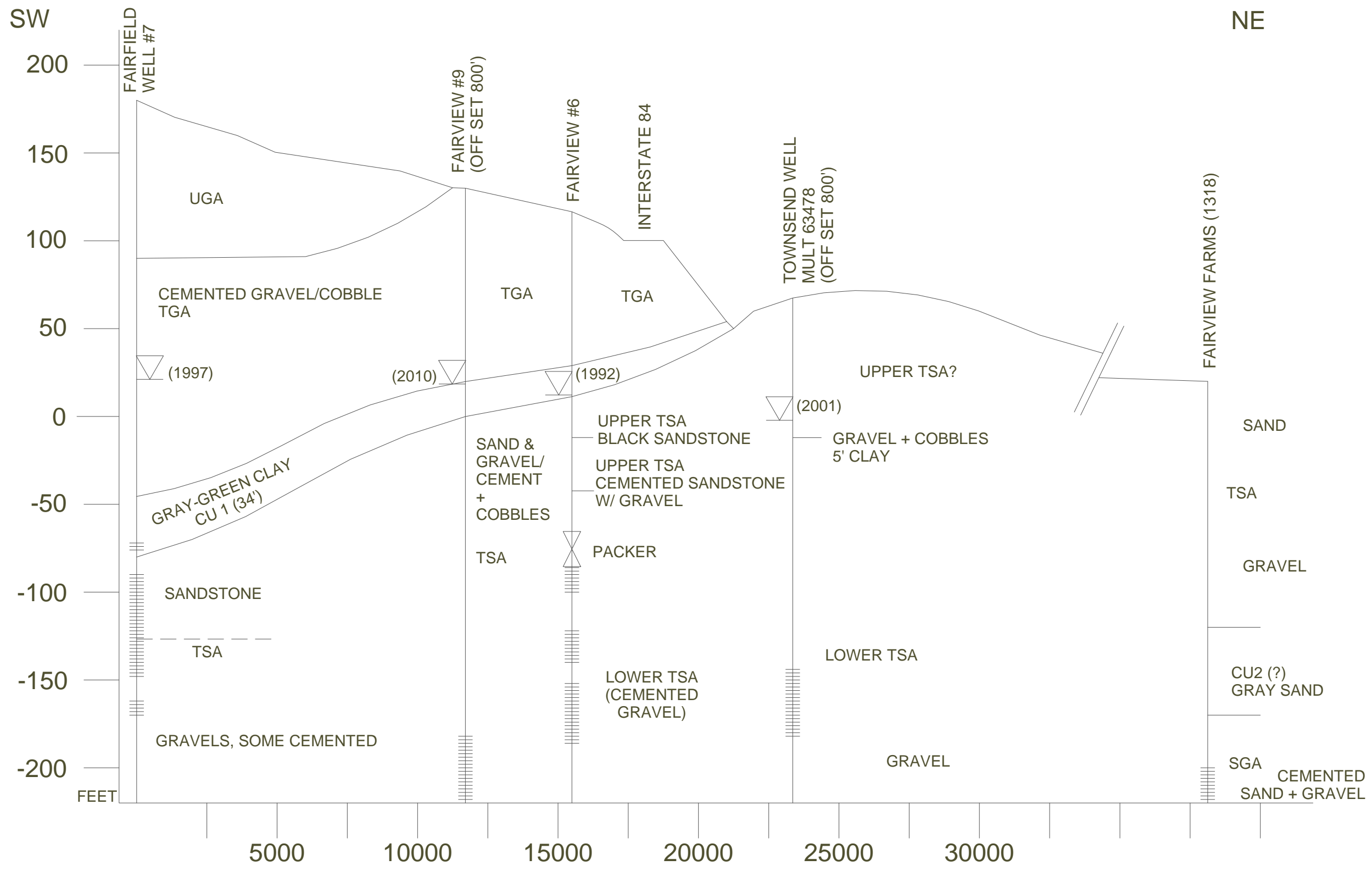
Date Drawn: 11/17/2016
 Project #: 1023-15001-01-
 Fig4_ZoningMap(v01)
 Drawn By: JOB
 Approved By: LDG

Townsend Business Park
 23303 NE Sandy Boulevard
 Fairview, Oregon

Zoning Map

Project No. 1023-15001-01
 Figure No. 4

DRAWING NUMBER 1023-16001(v01)
 APPROVED BY L. GREEN [09/26/2016]
 CHECKED BY B. LARY [09/26/2016]
 DRAWN BY J. BIGELOW [09/26/2016]

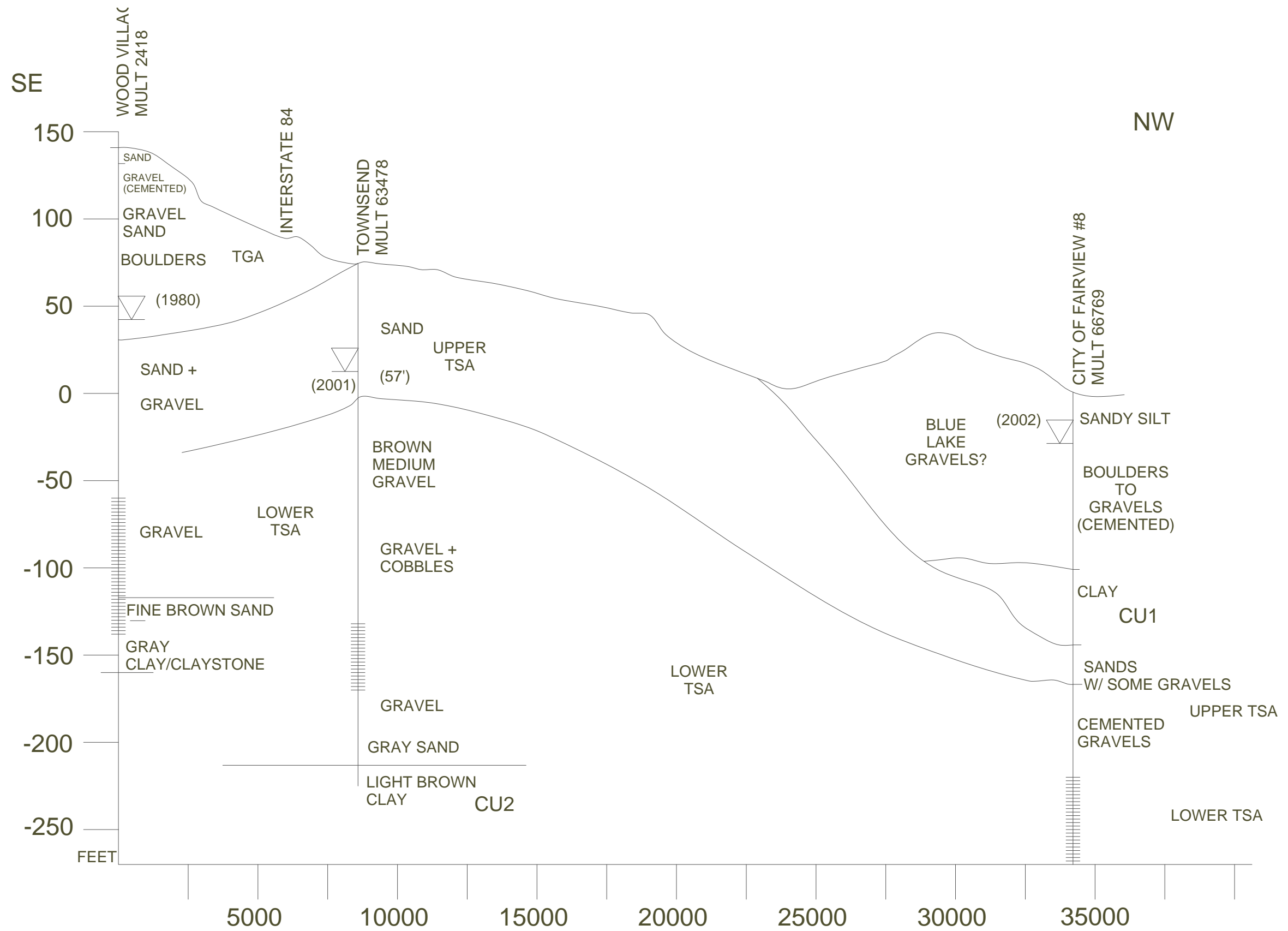


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STATIC WATER LEVEL

FIGURE 5
 GEOLOGIC CROSS-SECTION A-A'
 SW TO NE
 TOWNSEND FARMS
 23303 NE SANDY BOULEVARD
 FAIRVIEW, OREGON

DRAWING NUMBER 1023-16001(v01)
 APPROVED BY L. GREEN 09/26/2016
 CHECKED BY B. LARY 09/26/2016
 DRAWN BY J. BIGELOW 09/26/2016




 STATIC WATER LEVEL



PO BOX 14488, PORTLAND, OREGON 97293
 P: (503)452-5561, E: ENW@EVREN-NW.COM

FIGURE 6
GEOLOGIC CROSS-SECTION B-B'
SE TO NW
 TOWNSEND FARMS
 23303 NE SANDY BOULEVARD
 FAIRVIEW, OREGON

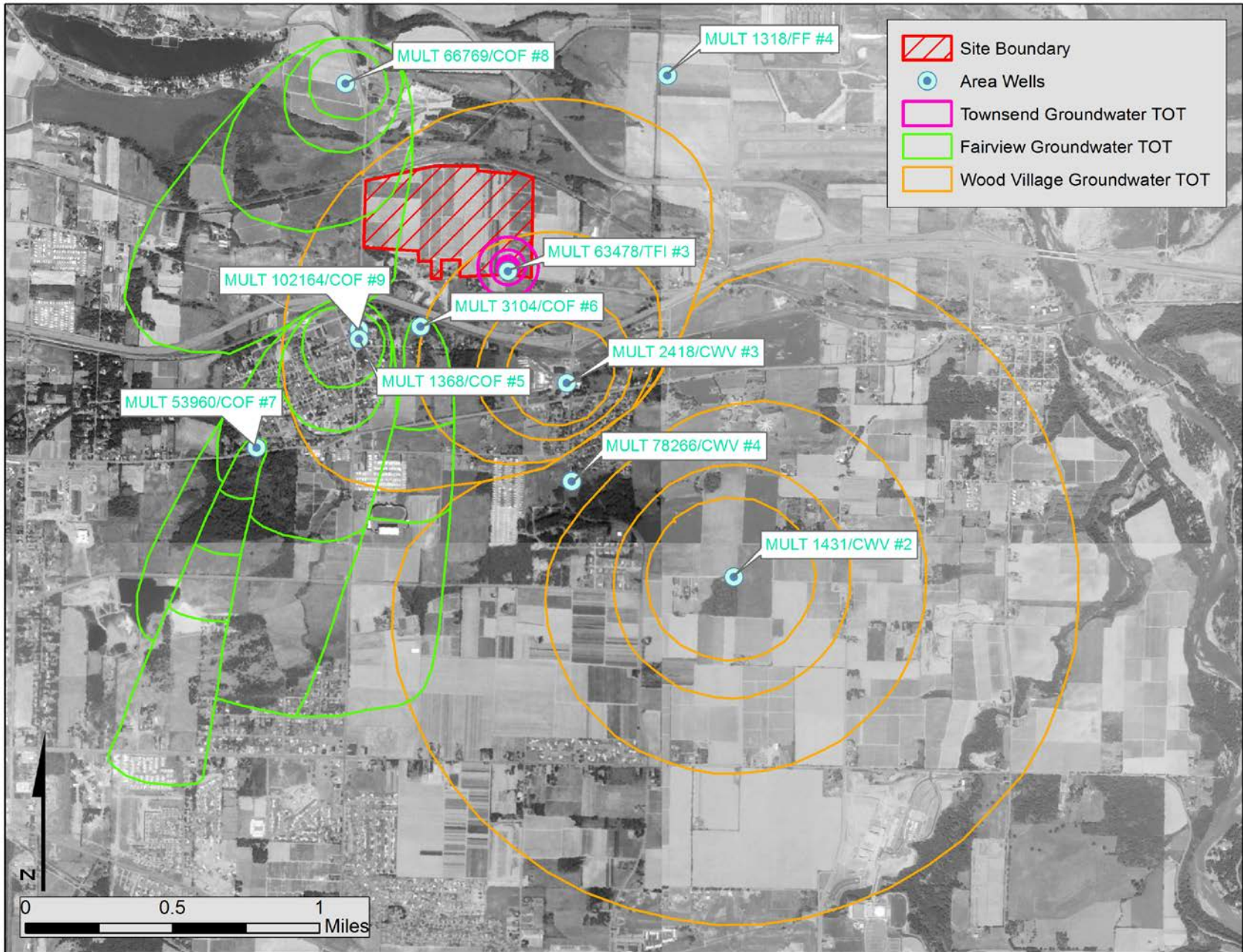


Date Drawn: 11/17/2016
 CAD File Name: 1023-15001-01fig7WellLocation(v02)
 Drawn By: JOB
 Approved By: LDG

Townsend Business Park
 23303 NE Sandy Boulevard
 Fairview, Oregon

Well Location & Cross Section Diagram

Project No.
 1023-15001-01
 Figure No.
 7



Date Drawn: 11/30/2016
 CAD File Name: 1023-15001-01fig8TimeOfTravel(v02)
 Drawn By: PMT
 Approved By: LDG

Townsend Business Park
 23303 NE Sandy Boulevard
 Fairview, Oregon

**Time of Travel (Capture) Curves
 for Select Wells
 (1970 Aerial Base Map)**

Project No.
 1023-15001-01
 Figure No.
8

Figure 9
EDB Concentration Vs. Time
TFI and CoF Wells

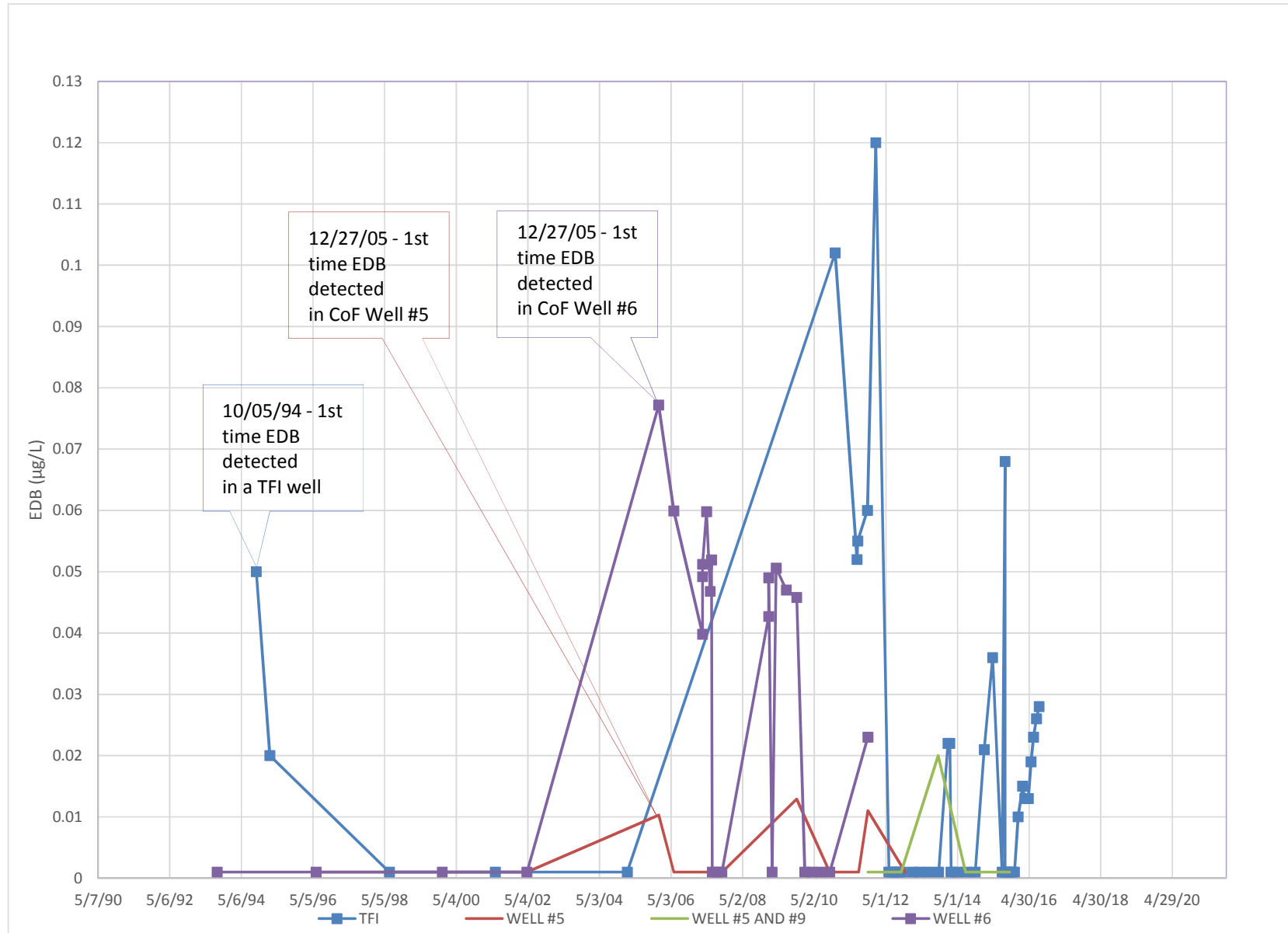
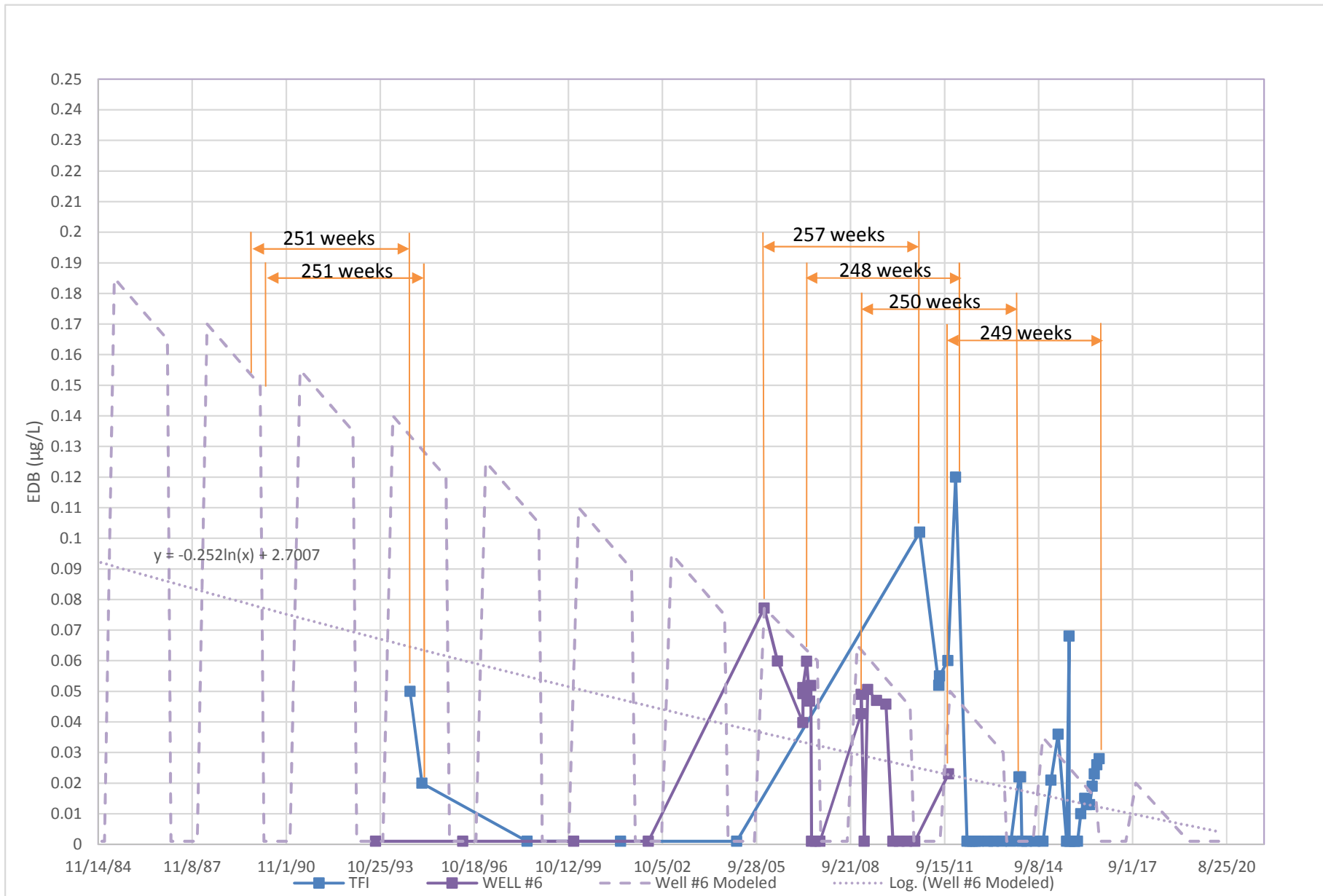


Figure 10
EDB Concentration Vs. Time
Correlation of EDB Detects
TFI Well #2 / #3 and CoF Well #6



ATTACHMENT A
WATER WELL LOGS / WATER RIGHTS

STATE OF OREGON
WATER SUPPLY WELL REPORT
 (as required by ORS 537.765)

WELL I.D. # L 47470
 START CARD # 139288

Instructions for completing this report are on the last page of this form.

(1) **LAND OWNER**
 Name TOWNSEND FARMS Well Number _____
 Address 23303 NE SANDY
 City FAIRVIEW State OR Zip 97024

(2) **TYPE OF WORK**
 New Well Deepening Alteration (repair/recondition) Abandonment

(3) **DRILL METHOD:**
 Rotary Air Rotary Mud Cable Auger
 Other _____

(4) **PROPOSED USE:**
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other _____

(5) **BORE HOLE CONSTRUCTION:**
 Special Construction approval Yes No Depth of Completed Well 260 ft.
 Explosives used Yes No Type _____ Amount _____

HOLE		SEAL		Sacks or pounds	
Diameter	From To	Material	From To		
12 1/2	0 260	Cement	0 25	10	sks
		Bentonite	25 35	10	sks
		Cement	145 155	4	sks

7-7/8 260 297
 How was seal placed: Method A B C D E
 Other poured into annular
 Backfill placed from 35 ft. to 145 ft. Material Drill gel
 Gravel placed from 155 ft. to 260 ft. Size of gravel 1/4x3/8

(6) **CASING/LINER:**

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 8"	+2	205	250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8"	245	260	250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drive Shoe used Inside Outside None
 Final location of shoe(s) _____

(7) **PERFORATIONS/SCREENS:**
 Perforations Method _____
 Screens Type wirewound Material Stainless

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
205	245	.020		8	pipe	<input checked="" type="checkbox"/>	<input type="checkbox"/>

(8) **WELL TESTS: Minimum testing time is 1 hour**

Yield gal/min	Drawdown	Drill stem at	Flowing Time
55	10		1 hr.
180		115	2 hrs.

Pump Bailer Air Artesian

Temperature of water 57°F Depth Artesian Flow Found _____
 Was a water analysis done? Yes By whom _____
 Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
 Depth of strata: _____

(9) **LOCATION OF WELL by legal description:**
 County MULTNOMAH Latitude _____ Longitude _____
 Township 1N N or S Range 3E E or W. WM.
 Section 27 SE 1/4 NE 1/4
 Tax Lot 800 Lot _____ Block _____ Subdivision _____
 Street Address of Well (or nearest address) 23303 NE SANDY FAIRVIEW, OR

(10) **STATIC WATER LEVEL:**
57 ft. below land surface. Date 03/26/01
 Artesian pressure _____ lb. per square inch Date _____

(11) **WATER BEARING ZONES:**
 Depth at which water was first found 205

From	To	Estimated Flow Rate	SWL
205	245	180 gpm	57

RECEIVED

MAR 30 2001

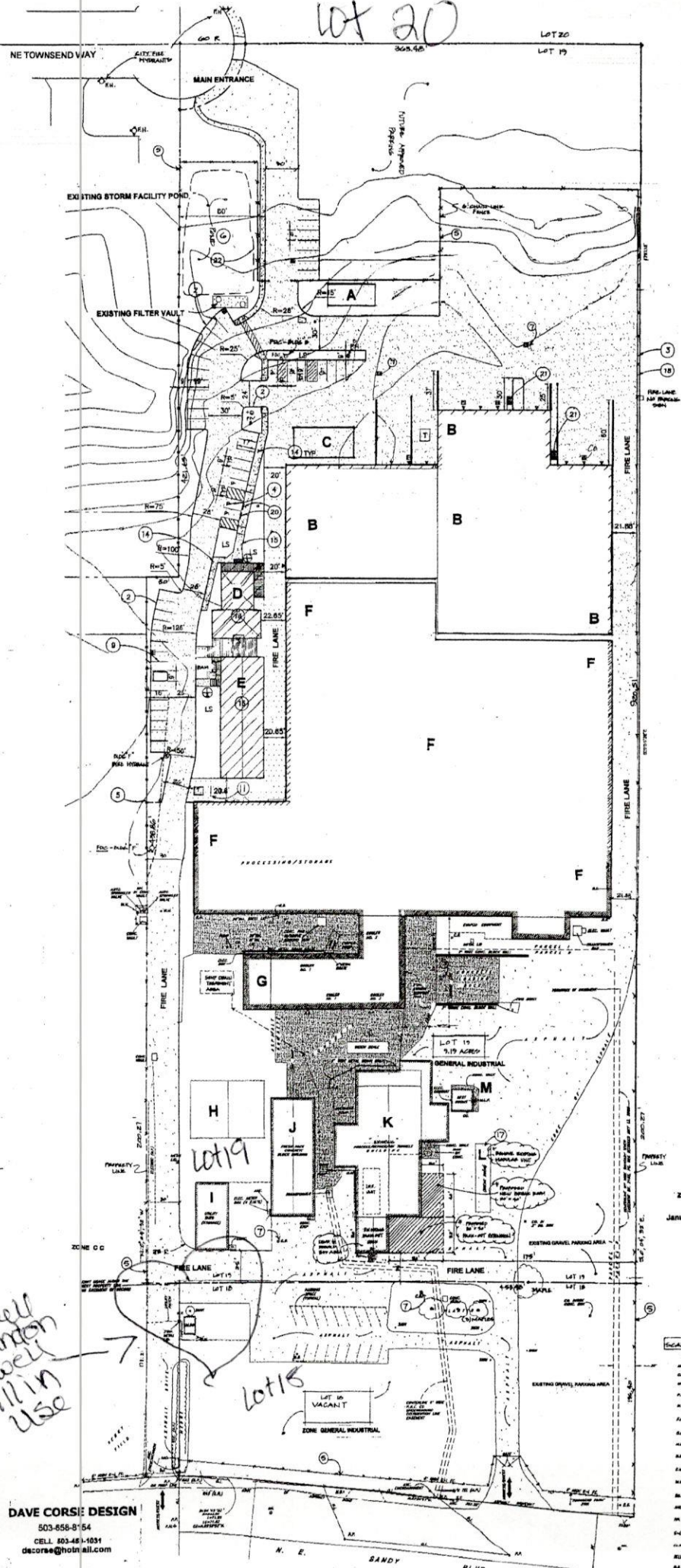
(12) **WELL LOG:**
 Ground Elevation WATER RESOURCES DEPT. SALEM, OREGON

Material	From	To	SWL
Topsoil/silty clay	0	4	
Fine compact sand, brown	4	10	
Fine compact sand, gray	10	16	
Fine to med. compact sand, brown, occ gravel	16	63	
Med. to coarse sand, gravel/cobble	63	77	
Fine to med. brown gravel, occ. coarse, some gray zones	77	233	57
Soft brown clay	233	235	"
Soft gray clay	235	238	"
Fine to coarse gravel	238	247	57
Fine to med. gravel w/clay	247	254	
Fine to med. gravel	254	267	
Coarse gray sand, some gravel	267	291	
Sticky lt. brown clay	291	297	

WELL COMPLETED @ 260 FT.
 Date started 03/14/01 Completed 03/26/01

(unbonded) **Water Well Constructor Certification:**
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
 Signed _____ WWC Number _____ Date _____

(bonded) **Water Well Constructor Certification:**
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
 Signed [Signature] WWC Number 1266 Date 03/26/01



Applicant/Owner: Townsend Farms Inc.
 23400 SE Townsend Way
 Fairview, Oregon 97024
 Contact: Margaret Townsend
 503-650-1700

Site: Lot 19 1A, 3E, 27A
 Tax Lot: 19
 Acreage: 9.19
 Zoning: General Industrial, (G)



TOWNSEND FARMS
 23400 NE TOWNSEND WAY
 Fairview, Oregon 97024
 Multnomah County

23400 NE Townsend Way
 Fairview, OR 97024
 (503) 650-1700 Office
 (503) 650-6924 Fax

www.townsendfarms.com

Fresh of Frazar
 10231
 Purcell
 Dwight P. King
 David W. King

KEYNOTES

1. 30' DRIVEWAY PER CITY OF FAIRVIEW
2. VERTICAL CURB.
3. EDGE OF PAVEMENT.
4. HANDICAP PARKING.
5. CHAIN-LINK FENCE, (6' HIGH, TYP)
6. WATER QUALITY/RETENTION POND AREA.
7. CAMP (EAT) CATCH DRAIN
8. PROPERTY LINE (ADJUSTED).
9. 4" WHITE PARKING STRIPE
10. MATCH EXISTING.
11. BIKE RACK FOR SIX BICYCLES.
12. PLANT EXPANSION AREA.
13. RELOCATED OFFICE STRUCTURE.
14. MONOLITHIC CURB AND SIDEWALK.
15. SIDEWALK.
16. MODULAR BUILDING.
17. STRUCTURE TO BE REMOVED
18. FENCING AND LANDSCAPING TO REMAIN
19. 30' DOUBLE LEAF GATE
20. CURB STOP.
21. STAIRS.
22. TOP OF POND
23. EDGE OF GRAVEL.

small to well still in use

OVERALL SITE PLAN
LOT 19

DAVE CORSIE DESIGN
 503-656-8154
 CELL: 603-461-1031
 dcorsie@hotmail.com

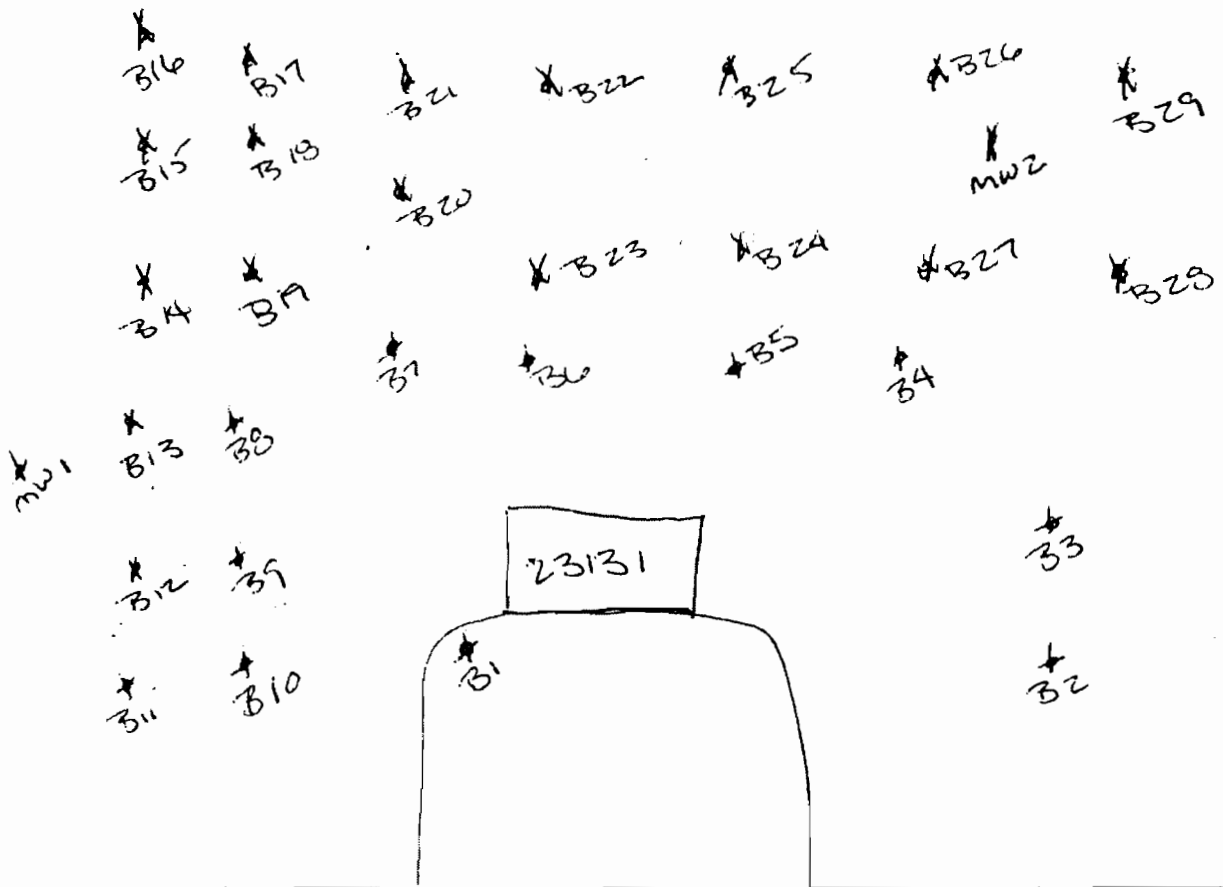
ZONE CC
 JANUARY 30, 2012



- LEGEND**
- 1A = EXISTING
 - 1B = EXISTING
 - 1C = EXISTING
 - 1D = EXISTING
 - 1E = EXISTING
 - 1F = EXISTING
 - 1G = EXISTING
 - 1H = EXISTING
 - 1I = EXISTING
 - 1J = EXISTING
 - 1K = EXISTING
 - 1L = EXISTING
 - 1M = EXISTING
 - 1N = EXISTING
 - 1O = EXISTING
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N. E. SANDY BLVD.

NE 230TH



SANDY BLVD

RECEIVED

FEB 06 2006

WATER RESOURCES DEPT
SALEM, OREGON

1" = 50'



LAG
2 MW

STATE OF OREGON
WATER SUPPLY WELL REPORT

(as required by ORS 537.765)

WELL I.D. # L N/A
START CARD # 159689

Instructions for completing this report are on the last page of this form.

(1) LAND OWNER Well Number _____
Name TOWNSEND FARMS
Address 23303 NE SANDY
City FAIRVIEW State OR Zip 97204

(2) TYPE OF WORK
 New Well Deepening Alteration (repair/recondition) Abandonment

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable Auger
 Other _____

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other _____

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes No Depth of Completed Well = 0 ft.
Explosives used Yes No Type _____ Amount _____

HOLE				SEAL			
Diameter	From	To	Material	From	To	Sacks or pounds	
			SEE ITEM #12				

How was seal placed: Method A B C D E
 Other _____

Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liner:					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drive Shoe used Inside Outside None
Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
 Perforations Method Air rotary perforator
 Screens Type _____ Material Steel

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
0	98	1/4x2	1960	8"	pipe	<input checked="" type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

<input type="checkbox"/> Pump	<input type="checkbox"/> Bailer	<input type="checkbox"/> Air	<input type="checkbox"/> Flowing
Yield gal/min	Drawdown	Drill stem at	Artesian
			Time
			1 hr.

Temperature of water _____ Depth Artesian Flow Found _____
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
Depth of strata: _____

(9) LOCATION OF WELL by legal description:
County MULT. Latitude _____ Longitude _____
Township 1N N or S Range 3E E or W. WM
Section 27 SE 1/4 NE 1/4
Tax Lot 800 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 23303 NE SANDY

(10) STATIC WATER LEVEL:
62 ft. below land surface. Date 09/30/03
Artesian pressure _____ lb. per square inch Date _____

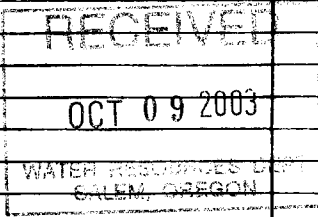
(11) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground Elevation _____

Material	From	To	SWL
Existing 8" irrigation well	0	136	62'
ABANDONMENT:			
8" casing perforated to		98 ft.	
Perforator would not go		pass 98 ft.	
Cem/Bent. pumped from			
bottom to surface	136	0	(47 sks)



Date started 09/30/03 Completed 10/01/03

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
Signed Dwayne Bigsby WWC Number 1805
Date 10/02/03

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
Signed [Signature] WWC Number 1266
Date 10/02/03

STATE ENGINEER
Salem, Oregon

MULT
001359

Well Record

STATE WELL NO. LN/3-27F
COUNTY Multnomah
APPLICATION NO. GR-3339

OWNER: William Alan Townsend and
Florence M. Townsend

MAILING ADDRESS: Route 2, Box 111

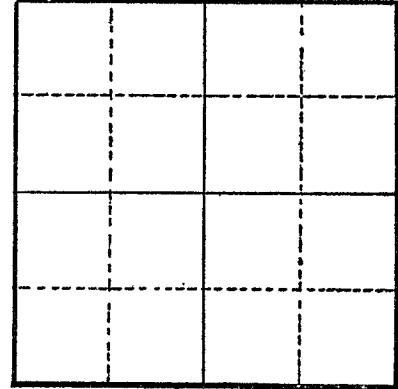
LOCATION OF WELL: Owner's No.

CITY AND STATE: Troutdale, Oregon

SE 1/4 NW 1/4 Sec. 27 T. 1 N. S. R. 3 E. W.M.

Bearing and distance from section or subdivision

corner 900' N. and 500' W.



Section

Altitude at well

TYPE OF WELL: drilled Date Constructed 1939

Depth drilled 76' Depth cased 60'

CASING RECORD:

6"

FINISH:

perforations

AQUIFERS:

sandy loam, sand rock, gravel

WATER LEVEL:

25'

PUMPING EQUIPMENT: Type Jacuzzi H.P. 10
Capacity 150 G.P.M.

WELL TESTS:

Drawdown 15 ft. after hours pumping 150 G.P.M.

Drawdown ft. after hours G.P.M.

USE OF WATER Dairy & Irrigation Temp. °F., 19.....

SOURCE OF INFORMATION GR-3093

DRILLER or DIGGER

ADDITIONAL DATA:

Log Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

Sandy Loam 12
Layer Sand Rock 4 to 6
Gravel Material to bottom 72'

RECEIVED
OCT 11 1956
STATE ENGINEER
BUREAU OF WATER

REGISTRATION NO. GR-301

230th ST.

CERTIFICATE NO. GR-280

Registration Statement

OF CLAIMANT OF RIGHT TO APPROPRIATE GROUND WATER

(Under Chapter 708, Oregon Laws 1955.)

TO THE STATE ENGINEER OF OREGON:

I, ALVIN H. KASER Rt. 2, Box 119
of Walt Troutdale County of MULTNOMAH

State of OREGON, do hereby make application for a certificate of registration as evidence of a right to appropriate ground water.

- Source from which water is withdrawn is Pump Well
(Flowing well, pump well, infiltration trench, or tunnel)
- Location is: 0.11 North City Limits of Troutdale
(Approximate distance and direction from nearest city or town)

and is more particularly described as follows:

- (a) 600 feet west and 60 feet North of SE corner of the NE 1/4 of NW 1/4 of Sec. 27
(Give distance and bearing to corner of section or other legal subdivision)
being within NE NW of Sec. 27, Twp. T1N, Rge. 1E
(Smallest legal subdivision) (N. or S.) (E. or W.)
- or (b) within limits of recorded platted property, town or city: FIRKIN
in Lot _____, Block _____ of _____
(Name of plat or addition)

County of _____
(If within city or town, give name)

3. Construction Work was begun on Oct 7, 1952; was completed on Oct 24, 1952
(Date) (Date)
and the ground water claimed was first used for the purposes set out below on Oct 24, 1952
(Date)
since which time the water has been used Each Summer
(Continuously or intermittently)
from 1952 to 1956
(Date) (Date)

4. Quantity of water claimed and used is 250 gallons per minute; _____ acre feet per year.

5. Purpose or Purposes for which water is used IRRIGATE ROW CROPS
(Domestic, irrigation, municipal, manufacturing, industrial, etc.)

6. Description of Well: Depth 23.8' feet. Type DRILLED
(Dug or drilled)
diameter 3" ED inches. Elevation of ground at well site 40' feet, mean sea level.
(As near as known)
Depth to water table 31' feet.

7. Capacity of Well: 150 g.p.m. with 21 feet drawdown.
250 g.p.m. with 35 feet drawdown.

Date of test 300 400
400 500
10/1/52

If Flowing Well: Measured discharge g.p.m. on _____
(Date)

Shut-in pressure at ground surface 1 lbs. per sq. in. on _____
(Date)

Water is controlled by _____
(Cap, valve, etc.)

8. Casing: (Give diameter, commercial specifications and depth below ground surface of each casing size.)

8.12 inch diameter from 0 to 141 feet
 5.75 inch diameter LINER from 141 to 235 feet
 inch diameter from to feet
 inch diameter from to feet

Describe and show depth of shoe, plug, adapter, liner or other details:

9. Perforated Casings or Screens:

Perforated ? from 141 to 235 feet
(Number per foot and size of perforations, or describe screen)
 from to
 from to
 from to

10. Log of Well: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

MATERIAL	Thickness (Feet)	Depth to Bottom (Feet)
SANDY Clay	9	9
Hard cemented Sand & Gravel	21.30	30 (30)
Start of Water Level at 31'		
Cemented Sand & Gravel	25	55
Very small cementing at 55 Level		
Soft dirty cement & gravel - very little water entering at this level	13	68
Cement casing with some very hard streaks	52	120
Soft cement slightly cemented	18	138
Hard cement & gravel	70	208
Tested 70 cpm at 130' level		
1" 45' 138'		
Layer of cemented Sand & Gravel	26	235
Hard Sand & Gravel		
Layer of Gravel	2	237
Probably all the water is coming in below the 208' level		

GR-280 A

If log of well is not available, give name and address of driller. ✓

11. Infiltration Trench: Covered or open _____

Dimensions: Length _____ ft. Minimum depth _____ ft. Maximum depth _____ ft.

Bottom width _____ ft. Discharge _____ g.p.m. Date of test _____

12. Tunnel: Type of lining _____

Dimensions: _____
(Length, course, and cross sectional size)

Position of water bearing stratum with reference to portal of tunnel _____

Log of tunnel: (Preceding table for log of well may be used, if desired. Give footage from portal and character of materials, as pertinent.)

13. Pumping Equipment:

(a) Pump: ~~1.5 Motor 15 HP~~ ^{Recirc pump 83A9DT} - 4 Bw's: "4" Capacity 250 g.p.m.
(Make, type and size)

(b) Motor: 1.5 Motor 15 HP 220V 40 AMP 3 Phase Type SCV
(Type and horsepower)

14. Location of area irrigated or to be irrigated, or place of use if for purposes other than irrigation:

Township North or South	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated	Date of Reclamation
1N	1E	27	NW 1/4 - NE 1/4	2 2	Oct 22, 1952
1N	3E	27	NE 1/4 of NW 1/4	33.5	"
1N	3E	27	SE 1/4 of NW 1/4	10.5	"
1N	3E	22	SE 1/4 of SW 1/4	8	"
				54.0 Ac	

15. If the ground water supply is supplemental to an existing water supply, identification of any application for a permit, permit, certificate or adjudicated right to appropriate water made or held by the registrant.

STATE ENGINEER
Salem, Oregon

MULT
1009

Well Record

STATE WELL NO. 1N/1-27C(1)
COUNTY Multnomah
APPLICATION NO. GR-301

OWNER: Alvin K. Kaaser

MAILING
ADDRESS:

Route 2, Box 119

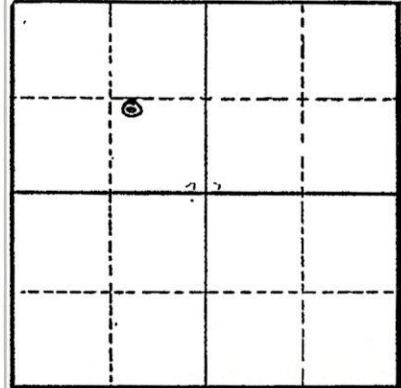
LOCATION OF WELL: Owner's No. 1

CITY AND
STATE:

Troutdale, Oregon

NE 1/4 NW 1/4 Sec. 27 T. 1 N. S., R. 1 E., W.M.

Bearing and distance from section or subdivision
corner 600' W. and 600' N. of SE cor. of
NE 1/4 NW 1/4 of Sec. 27.



Section 27

Altitude at well 40 feet Interpolated

TYPE OF WELL: Drilled Date Constructed 10-7-52

Depth drilled 238' Depth cased 238'

CASING RECORD:

8 inch casing set from 0 to 141 feet

5 inch I.D. liner set from 141 to 238 feet

FINISH:

Perforated from 141 to 238 feet

AQUIFERS:

Gravels from 206 to 238 feet

WATER LEVEL:

31 feet below land surface

PUMPING EQUIPMENT: Type Pacific 4" (9 bowls) H.P. 15
Capacity 250 G.P.M.

WELL TESTS: 35 250
Drawdown 21 ft. after _____ hours 150 G.P.M.
Drawdown 40 ft. after _____ hours 300 G.P.M. pumping
Drawdown 52 ft. after _____ hours 400 G.P.M.

USE OF WATER Irrigation 54 acres Temp. _____ °F., 19

SOURCE OF INFORMATION Registration Statement GR-301

DRILLER or DIGGER _____

ADDITIONAL DATA:

Log Water Level Measurements _____ Chemical Analysis _____ Aquifer Test _____

REMARKS:

Registration Statement

OF CLAIMANT OF RIGHT TO APPROPRIATE GROUND WATER

TO THE STATE ENGINEER OF OREGON:

I, William Alan Townsend & Florence M. Townsend
of Rt. 2 Box 111 Troutdale, Ore County of Multnomah
(Mailing address)

State of Oregon, do hereby make application for a certificate of registration as evidence of a right to appropriate ground water.

1. Source from which water is withdrawn is Pump Well
(Flowing well, pump well, infiltration trench, or tunnel)

2. Location is: One quarter mile East of Fairview Cor
(Approximate distance and direction from nearest city or town)

and is more particularly described as follows: 900 feet north & 50 feet west from Center of Section 27,

(a) 1/4 mi. East of Section Corner No. 27
(Give distance and bearing to corner of section or other legal subdivision)

being within SE 1/4 of NW 1/4 of Sec. 27, Twp. 1 North, Rge. 3 East
(Smallest legal subdivision) (N. or S.) (E. or W.)

or (b) within limits of recorded platted property, town or city: _____

in Lot _____, Block _____ of _____
(Name of plat or addition)

County of Multnomah
(If within city or town, give name)

3. Construction Work was begun on Sept 5 1939; was completed on Oct 1939
(Date) (Date)

and the ground water claimed was first used for the purposes set out below on Oct 1939
(Date)

since which time the water has been used Continuously
(Continuously or Intermittently)

from Oct 1939 to 7/15/50
(Date) (Date)

4. Quantity of water claimed and used is 150 gallons per minute; _____ acre feet per year.

5. Purpose or Purposes for which water is used Domestic, Irrigation, Fairly to Irrigation

(Domestic, irrigation, municipal, manufacturing, industrial, etc.)

6. Description of Well: Depth 76 feet. Type Dug Well
(Dug or drilled)

diameter _____ inches. Elevation of ground at well site 3277 feet, mean sea level.
(As near as known)

Depth to water table 25 feet.

7. Capacity of Well: 150 g.p.m. with 15 feet drawdown.

_____ g.p.m. with _____ feet drawdown.

Date of test Oct-59

If Flowing Well: Measured discharge _____ g.p.m. on _____
(Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____
(Date)

Water is controlled by _____
(Cap, valve, etc.)

If log of well is not available, give name and address of driller.....

Not available

11. Infiltration Trench: Covered or open.....

Dimensions: Length..... ft. Minimum depth..... ft. Maximum depth..... ft.

Bottom width..... ft. Discharge..... g.p.m. Date of test.....

12. Tunnel: Type of lining.....

Dimensions:.....
(Length, course, and cross sectional size)

Position of water bearing stratum with reference to portal of tunnel.....

Log of tunnel: (Preceding table for log of well may be used, if desired. Give footage from portal and character of materials, as pertinent.)

13. Pumping Equipment:

(a) Pump 3 phase 10 HP Capacity 150 g.p.m.
(Make, type and size)

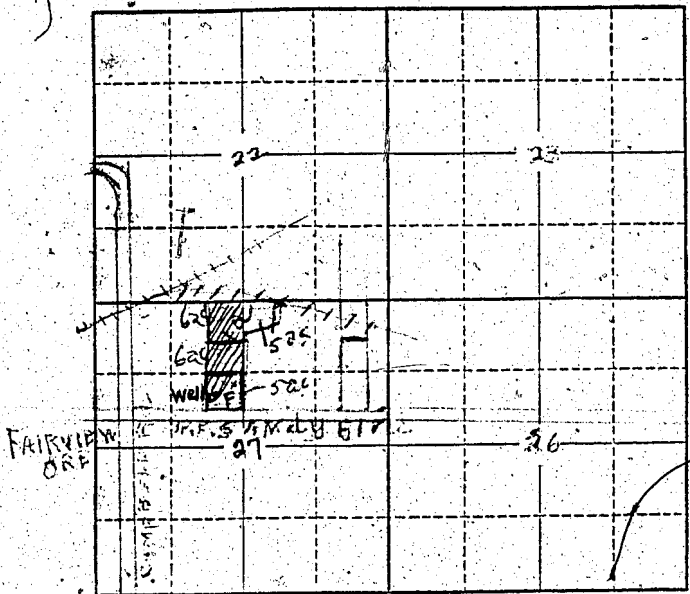
(b) Motor 3 phase 10 HP
(Type and horsepower)

14. Location of area irrigated or to be irrigated, or place of use if for purposes other than irrigation.

Township North or South	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated	Date of Reclamation
	1 NORTH		3	3	1939
1N	3E	27	NW 1/4 of NE 1/4	5 1/2 ACRES	1905
1N	3E	27	NE 1/4 of NW 1/4	12 1/2 ACRES	1939
1N	3E	27	SE 1/4 of NW 1/4	5 1/2	"
1N	3E	27	SW 1/4 of NW 1/4	5 1/2	"
				22 1/2	"

15. If the ground water supply is supplemental to an existing water supply, identification of any application for a permit, permit, certificate or adjudicated right to appropriate water made or held by the registrant.

Township 1 N Range 3 E, W.M.
North



Locate well and acreage of irrigated land on plat.
Scale: 2" = 1 Mile

STATE OF OREGON

County of Multnomah } ss.

I, Wm. Alan Townsend & Florence M. Townsend, being first duly sworn, do hereby certify that I have read the foregoing Registration Statement and that all of the items therein contained are true to the best of my knowledge and belief.

Wm. Alan Townsend & Florence M. Townsend
(Signature of Registrant)

Subscribed and sworn to before me this 27th day of July, 1958.

My commission expires Sept 5, 1958

[Signature]
(Notary Public)

(SEAL)

CERTIFICATE OF REGISTRATION

STATE OF OREGON

County of Marion } ss.

This is to certify that the foregoing Registration Statement was received in the office of the State Engineer on the 31st day of July, 1958, at 2:00 o'clock A. M. and has been duly recorded in said office in Book No. 13 of Registration Statements on page GR-3093

Witness my hand this 16th day of June, 1959.

[Signature]
(State Engineer)

By _____
(Deputy)

\$15.00

STATE OF OREGON
WATER SUPPLY WELL REPORT
 (as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 100766

START CARD # 201156

(1) LAND OWNER Owner Well I.D. 3
 First Name _____ Last Name _____
 Company City of Fairview
 Address 1300 NE Village St
 City Fairview State OR Zip 97024

(2) TYPE OF WORK New Well Deepening Conversion
 Alteration (repair/recondition) Abandonment

(3) DRILL METHOD
 Rotary Air Rotary Mud Cable Auger Cable Mud
 Reverse Rotary Other _____

(4) PROPOSED USE Domestic Irrigation Community
 Industrial/ Commercial Livestock Dewatering
 Thermal Injection Other abandonment

(5) BORE HOLE CONSTRUCTION Special Standard Attach copy
 Depth of Completed Well 0 ft.

BORE HOLE			SEAL			Amt	sacks/ lbs
Dia	From	To	Material	From	To		
			Cement	3	783	550	S

How was seal placed: Method A B C D E
 Other _____
 Backfill placed from _____ ft. to _____ ft. Material _____
 Filter pack from _____ ft. to _____ ft. Material _____ Size _____
 Explosives used: Yes Type _____ Amount _____

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Shoe Inside Outside Other _____ Location of shoe(s) _____
 Temp casing Yes Dia _____ From _____ To _____

(7) PERFORATIONS/SCREENS
 Perforations Method _____
 Screens Type _____ Material _____

Perf/S	Casing/Screen	Screen	Dia	From	To	Scr/slot	Slot	# of	Tele/
screen	Liner	Dia	From	To	width	length	slots	pipe size	

(8) WELL TESTS: Minimum testing time is 1 hour
 Pump Bailer Air Flowing Artesian
 Yield gal/min _____ Drawdown _____ Drill stem/Pump depth _____ Duration (hr) _____

Temperature _____ °F Lab analysis Yes By _____
 Water quality concerns? Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
 County MULTNOM Twp 1 N N/S Range 3 E E/W WM
 Sec 27 NW 1/4 of the SW 1/4 Tax Lot 3700 or 3800
 Tax Map Number 1N 3E 27CB Lot _____
 Lat _____ ° 0 ' _____ " or _____ DMS or DD
 Long _____ ° 0 ' _____ " or _____ DMS or DD
 Street address of well Nearest address

48 First St, Fairview, OR 97024

(10) STATIC WATER LEVEL Date 05-09-2011 SWL(psi) _____ + SWL(ft) 105
 Existing Well / Predeepening _____ Completed Well _____
 Flowing Artesian? Dry Hole?

WATER BEARING ZONES Depth water was first found 105

SWL Date	From	To	Est Flow	SWL(psi)	+ SWL(ft)
N.A. - Abandonment					

(11) WELL LOG Ground Elevation _____

Material	From	To
Removed pump from well prior to abandonment.		
ABANDONMENT CONSISTED OF:		
Drilled out fill & debris - getting steel at bottom.	657	783
Processed 1st Special Standard.		
Excavated around 10" casing to locate 12" casing; found concrete pit and no 12" casing.		
Processed 2nd Special Standard.		
Perforated 10" casing from just above 783' to surface except where video showed substantial existing mills knife perforations (316-347 and 273-307); added >21,000-1/4"x1" air rotary perforations.		
Placed 25 CY of cement grout under pressure from 783' to 3' below ground surface.		
Cut off 10" casing 3' below ground surface.		
Backfilled 4' deep vault with ~1' of grout and 3' of original material (small pea gravel) to allow future access for replumbing within the vault if desired.		

Date Started 05-10-2011 Completed 06-09-2011

(unbonded) Water Well Constructor Certification
 I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
 License Number 1860 Date 06-16-2011
 Password: (if filing electronically) _____
 Signed [Signature]

(bonded) Water Well Constructor Certification
 I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
 License Number 649 Date 06-16-2011
 Password: (if filing electronically) _____
 Signed [Signature]
 Contact Info (optional) _____

STATE OF OREGON
WATER SUPPLY WELL REPORT
 (as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 100774

START CARD # 201147

(1) LAND OWNER Owner Well I.D. 9

First Name _____ Last Name _____
 Company City of Fairview
 Address 1300 NE Village St
 City Fairview State OR Zip 97024

(2) TYPE OF WORK New Well Deepening Conversion
 Alteration (repair/recondition) Abandonment

(3) DRILL METHOD
 Rotary Air Rotary Mud Cable Auger Cable Mud
 Reverse Rotary Other _____

(4) PROPOSED USE Domestic Irrigation Community
 Industrial/ Commercial Livestock Dewatering
 Thermal Injection Other _____

(5) BORE HOLE CONSTRUCTION Special Standard (Attach copy)
 Depth of Completed Well 574 ft.

BORE HOLE			SEAL				sacks/
Dia	From	To	Material	From	To	Amt	lbs
24 *	0	317.5	Bentonite	0	5	16	S
16 *	317.5	580	Cement	5	317.5	301	S
<i>*nominal</i>							

How was seal placed: Method A B C D E
 Other bentonite poured
 Backfill placed from _____ ft. to _____ ft. Material _____
 Filter pack from 302.5 ft. to 580 ft. Material CSSI Size 10/20
 Explosives used. Yes Type _____ Amount _____

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
<i>Pitless Unit</i>	20 <i>in</i>	<input checked="" type="checkbox"/>	1.5	4	std	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	18	<input type="checkbox"/>	4	317.5	.375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	12	<input type="checkbox"/>	302.5	574	.375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Screen Assembly blanks? except at screens (?)

Shoe Inside Outside Other Location of shoe(s) _____
 Temp casing Yes Dia _____ From _____ To _____

(7) PERFORATIONS/SCREENS

Perforations Method _____
 Screens Type V-wire wrap Material 304SS

Perf/S	Casing/Screen	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tel/pipe size
<i>see (6) for blank sections of screen assembly</i>								
Screen		12	312.5	364	.04			
Screen		12	372	382	.04			
Screen		12	396	400	.04			
Screen		12	422	443	.04			

(8) WELL TESTS: Minimum testing time is 1 hour

Pump Bailer Air Flowing Artesian
 Yield gal/min 1,735 Drawdown 126 Drill stem/Pump depth _____ Duration (hr) 24
see attached graphs

Temperature 56 °F Lab analysis Yes By Test America

Water Quality Parameters Yes (describe below) _____
 Description Amount Units

Description	Amount	Units
<i>RECEIVED</i>		
<i>MAY 04 2010</i>		

(9) LOCATION OF WELL (legal description)

County MULTNOM Twp 1 N N/S Range 3 E E/W WM
 Sec 27 NW 1/4 of the SW 1/4 Tax Lot 3900
 Tax Map Number 1N 3E 27CB Lot _____
 Lat _____ ° _____ ' _____ " or _____ DMS or DD
 Long _____ ° _____ ' _____ " or _____ DMS or DD
 Street address of well Nearest address

48 First St, Fairview, OR 97024

(10) STATIC WATER LEVEL

Existing Well / Predeepening	Date	SWL (psi)	+ SWL (ft)
Completed Well	<u>04-23-2010</u>		<u>111</u>

Flowing Artesian? Dry Hole? *indeterminate - mud rotary drilled*

WATER BEARING ZONES Depth water was first found _____

SWL Date	From	To	Est Flow	SWL (psi)	+ SWL (ft)
<i>NA</i>	<i>?</i>	<i>317.5</i>	<i>unknown</i>		<i>NM</i>
<i>4/23/10</i>	<i>317.5</i>	<i>570</i>	<i>2000+</i>		<i>111</i>

(11) WELL LOG Ground Elevation _____

Material	From	To
Top soil, brown	0	1
Boulders, cobbles & clay, brown, silty	1	10
Cobbles, gravel & sand, brown, medium	10	45
Cobbles, gravel & sand, brown, med. w/cementation	45	90
Cobbles, gravel w/sand & clay, brown, medium	90	107
Sand, brown, med. w/clay, brown & some gravel	107	116
Clay, grey, med. w/gravel & sand, brown, medium	116	126
Gravel w/sand, black, coarse w/cementation	126	180
Gravel w/sand, black coarse	180	194
Cobbles, gravel w/sand, black coarse & cementation	194	247
Sand, brown, fine	247	258
Gravel & sand, brown, fine w/cementation	258	312
Sand, brown, fine & gravel w/cementation	312	321
Gravel, 1" - & sand, black, fine w/cementation	321	346
Gravel, 1.5" - & sand, multicolor, fine w/cementation	346	350
Sand, multicolored, fine-coarse	350	364
Clay, brown-grey, firm	364	369
Sand, fine & gravel, 1" - w/cementation	369	373
Sand, black, coarse-fine w/gravel, 1.5" -	373	382

Date Started 11-25-2009 Completed 04-13-2010

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

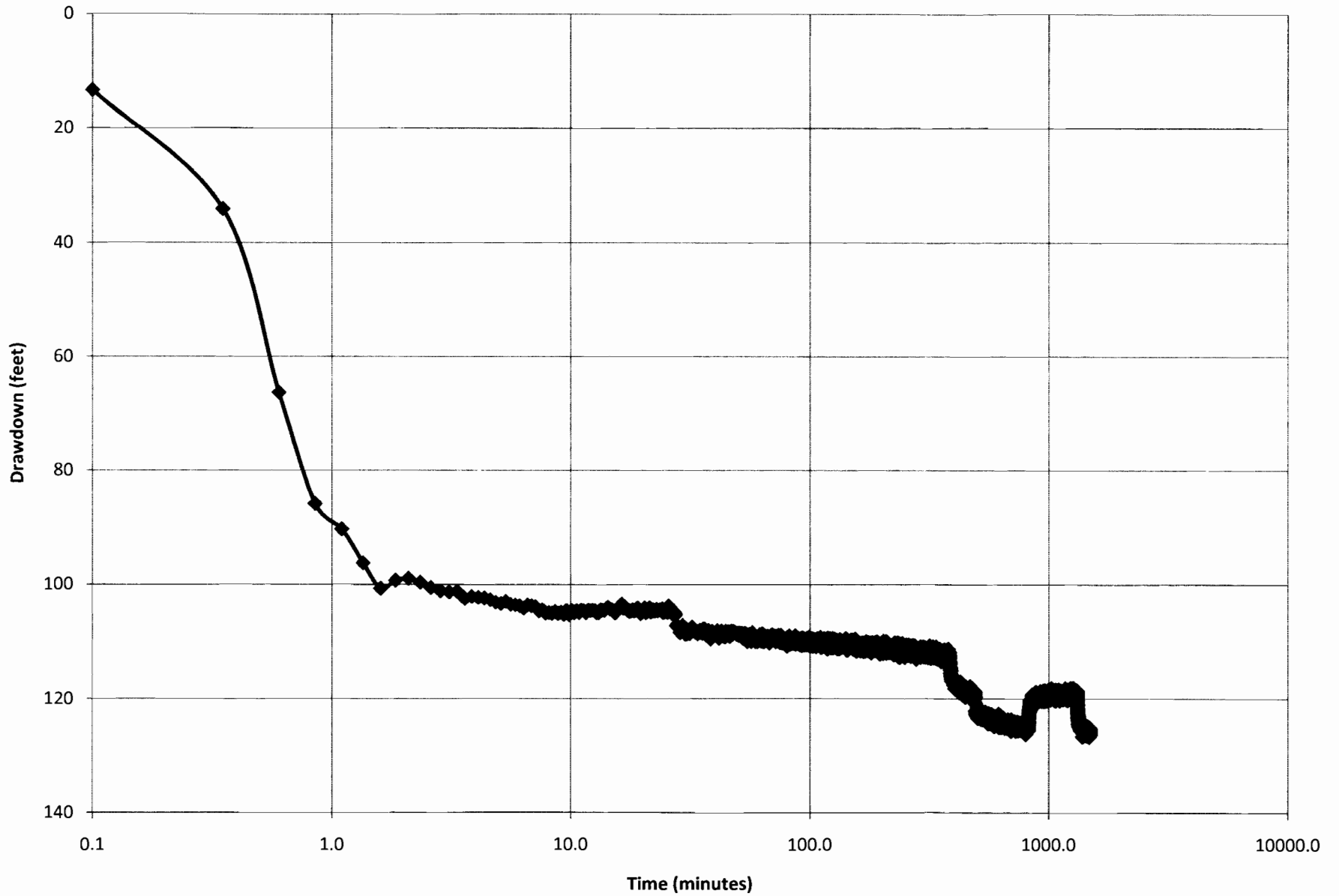
License Number 1860 Date 05-03-2010
 Password: (if filing electronically) _____
 Signed Jason Hill

(bonded) Water Well Constructor Certification

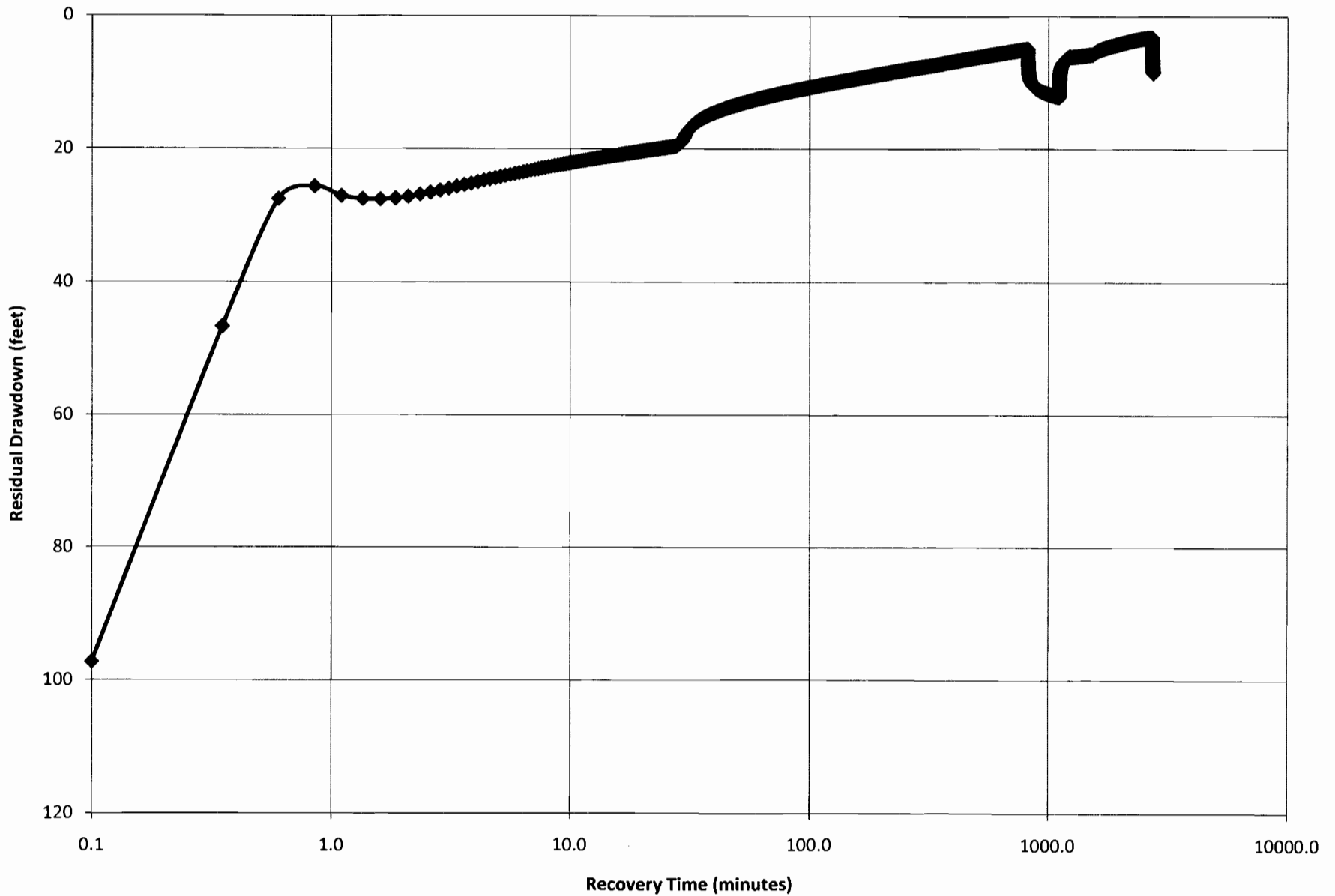
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 649 Date 05-03-2010
 Password: (if filing electronically) _____
 Signed Stephen Schneider
 Contact Info (optional) _____

City of Fairview Well #9 - 1735 GPM CR Test beginning 4/5/10



City of Fairview Well #9 - 1735 GPM CR Recovery beginning 4/6/10

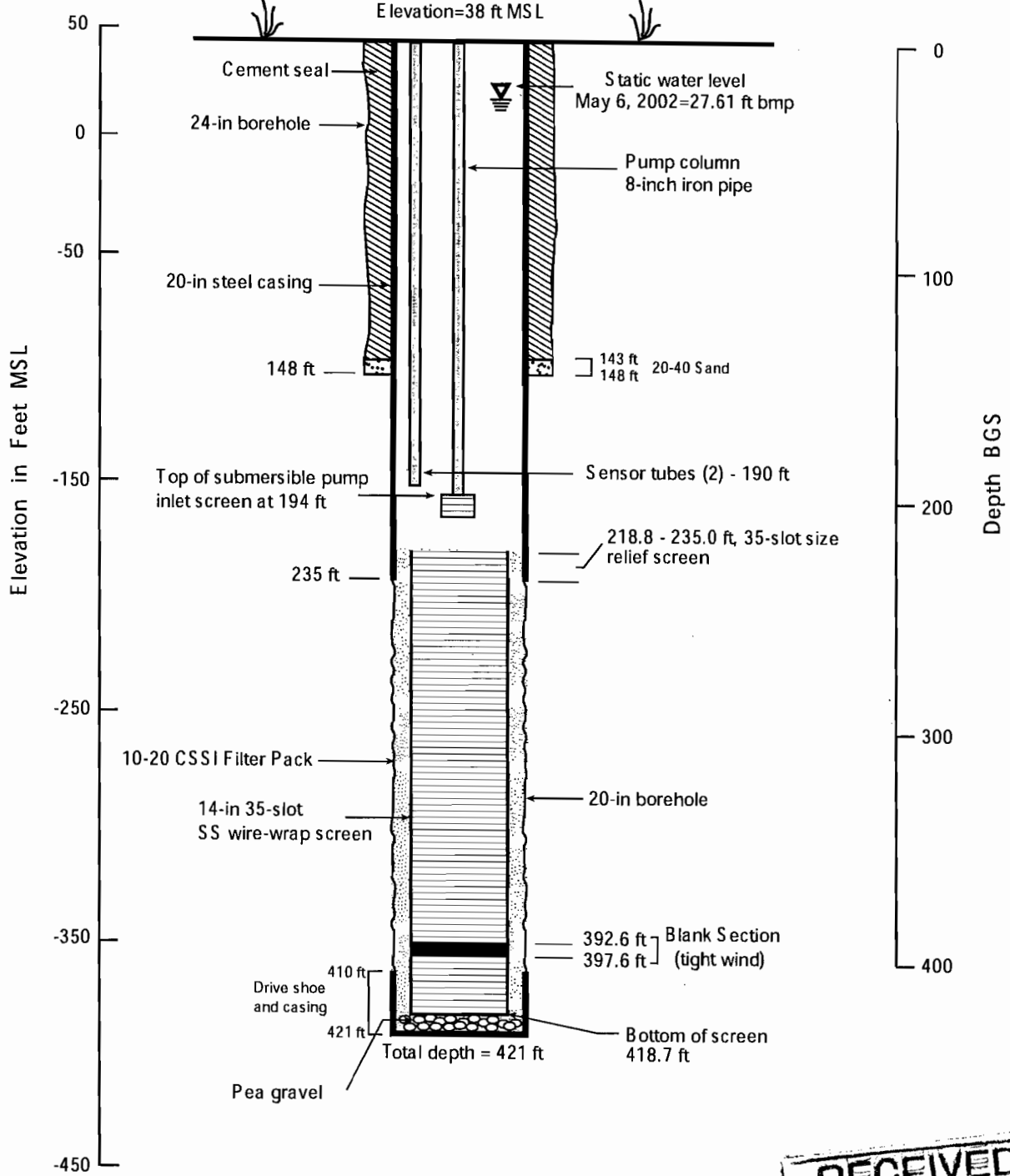


From file G-14121



City of Fairview Well No. 8




Drilled 2002

Elevation=38 ft MSL



Explanation

-  Cement or cement/bentonite seal
-  Filter pack

-  Casing wall and original borehole wall
-  Static water level
-  bmp Below measuring point

RECEIVED
 APR 19 2005
 WATER RESOURCES DEPT
 SALEM, OREGON

MULT 57019

RECEIVED

STATE OF OREGON WATER SUPPLY WELL REPORT (as required by ORS 537.765)

NOV 25 1998

(START CARD) # 85424

Instructions for completing this report are on the last page of this form.

WATER RESOURCES DEPT SALEM, OREGON

(1) OWNER:

Name: CITY OF FAIRVIEW, Address: 300 HARRISON, City: FAIRVIEW, State: ORE., Zip: 97214

LOCATION OF WELL by legal description:

County: Multnomah, Township: 1 N or S Range: 3 E or W. WM. Section: 28 SE 1/4 SW 1/4, Tax Lot: 4500, Street Address: next to 21523 Halsey St.

(2) TYPE OF WORK

Abandonment checked

(3) DRILL METHOD:

Rotary Air, Rotary Mud, Cable, Auger, Other

(4) PROPOSED USE:

Community checked, Industrial, Irrigation, Thermal, Injection, Livestock, Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval: Yes checked, No, Depth of Completed Well, Explosives used: Yes, No, Type, Amount

Table for HOLE SEAL with columns for Diameter, From, To, Material, Sacks or pounds

How was seal placed: Method A, B, C, D, E, Backfill placed from, Gravel placed from

(6) CASING/LINER:

Table for Casing and Liner with columns for Diameter, From, To, Gauge, Steel, Plastic, Welded, Threaded

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

Table for Perforations/Screens with columns for From, To, Slot size, Number, Diameter, Material, Casing, Liner

(8) WELL TESTS: Minimum testing time is 1 hour

Pump, Bailer, Air, Flowing Artesian, Yield gal/min, Drawdown, Drill stem at, Temperature of water, Depth Artesian Flow Found, Was a water analysis done?, Did any strata contain water not suitable for intended use?, Depth of strata:

(10) STATIC WATER LEVEL:

ft. below land surface, Date, Artesian pressure lb. per square inch, Date

(11) WATER BEARING ZONES:

Table for Water Bearing Zones with columns for From, To, Estimated Flow Rate, SWL

(12) WELL LOG:

WELL DATA: 16" cased hole to 298', 12" cased from 295'-355', 12" existing perforated from 289'-295', 16" perforated + 335'-350' w/ 360 parts, 16" perforated (existing) from 105'-115', 125'-152' + 174'-215', 1/6" re-perforated from 290'-surface w/ mills knife cutting 24 dents per 2 feet ABANDONMENT PROCEDURE: After perforating 16" bentonite chunks were put into the 12" from 352'-295', the 16" was perforated from 290'-236', bentonite was put from 295'-290' then 5' of medium sand; cement was mixed - pumped (32 sacks) + left to firm up; 2 lifts consisting of 227 sacks cement were mixed - pumped into the well; from 32' to 42' we put bentonite as cement was continually lost; cement was put into remaining hole from 40' to 2'.

Date started JAN. 20, '98 Completed FEB. 6, '98

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number, Signed, Date

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 655, Signed Michael Waldrop, Date Nov. 23, 98

MULT 53960

RECEIVED WELL I.D.#

STATE OF OREGON WATER SUPPLY WELL REPORT (as required by ORS 537.765)

JUL 24 1997

(START CARD) # 89247

Instructions for completing this report are on the last page of this form WATER RESOURCES DEPT.

(1) OWNER: City of Fairview Well Number SALEM, OREGON Name: City of Fairview Address: 300 Harrison City: Fairview State: OR Zip: 97214

(2) TYPE OF WORK: [X] New Well [] Deepening [] Alteration (repair/recondition) [] Abandonment

(3) DRILL METHOD: [] Rotary Air [] Rotary Mud [X] Cable [] Auger [] Other

(4) PROPOSED USE: [] Domestic [X] Community [] Industrial [] Irrigation [] Thermal [] Injection [] Livestock [] Other

(5) BORE HOLE CONSTRUCTION: Special Construction approval [X] Yes [] No Depth of Completed Well 363.3 Explosives used [] Yes [X] No Type Amount

Table with columns: HOLE Diameter, From, To, Material, SEAL From, To, Sacks or pounds. Includes entries for Cement and Cement/bent.

How was seal placed: Method [] A [] B [X] C [] D [] E [X] Other Hole Plug was poured dry Backfill placed from 380 ft. to 363.3 ft. Material Angular/Sluff Gravel placed from 363.3 ft. to 253 ft. Size of gravel 8-12

(6) CASING/LINER: Table with columns: Diameter, From, To, Gauge, Steel, Plastic, Welded, Threaded. Includes entries for Casing and Liner.

Final location of shoe(s)

(7) PERFORATIONS/SCREENS: Table with columns: From, To, Slot size, Number, Diameter, Tele/pipe size, Casing, Liner. Includes entries for Stainless screens.

(8) WELL TESTS: Minimum testing time is 1 hour. [X] Pump [] Bailer [] Air [] Artesian. Yield gal/min 200 Drawdown Drill stem at Time 48 hr.

Temperature of water 56 Depth Artesian Flow Found Was a water analysis done? [] Yes By whom Did any strata contain water not suitable for intended use? [] Too little [] Salty [] Muddy [] Odor [] Colored [] Other Depth of strata:

(9) LOCATION OF WELL by legal description: County Mult. Latitude Longitude Township 1N N or S Range 3E E or W. WM. Section 28 SE 1/4 SW 1/4 Tax Lot 4600 Lot Block Subdivision Street Address of Well (or nearest address) 21523 NE Halsey - site is next to this address

(10) STATIC WATER LEVEL: 154 ft. below land surface. Date 7/8/97 Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES: Depth at which water was first found 95'

Table with columns: From, To, Estimated Flow Rate, SWL. Includes handwritten 'See attached' and 'RECEIVED' stamp.

(12) WELL LOG: MAR 30 1998

Table with columns: Material, From, To, SWL. Includes handwritten 'See attached' and 'Note: Hole Plug was used as seal from 71 to 86' as per discussion with Rob Carter & Client'.

Date started 1-27-97 Completed 7-10-97

(unbonded) Water Well Constructor Certification: I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief. Signed [Signature] WWC Number 1523 Date 7/22/97

(bonded) Water Well Constructor Certification: I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief. Signed [Signature] WWC Number 1523 Date 7/22/97

RECEIVED

RECEIVED

JUL 24 1997

City of Fairview

MAR 30 1998

WATER RESOURCES DEPT.
SALEM, OREGON

(12) WELL LOG

WATER RESOURCES DEPT.
SALEM, OREGON

<u>Material</u>	<u>From</u>	<u>To</u>	<u>SWL</u>
Top Soil	0	4	
Boulders, cobbles and clay brown	4	25	
Gravels large with clay gray & brown	25	42	
Gravels large small with clay gray and brown	42	60	
Gravels large small with clay layers gray	60	70	
Gravels large small with clay gray	70	90	
Gravels cemented cobbles small with some clay gray	90	110	WB 95'
Gravels and large cobbles cemented with some clay gray	110	160	WB
Gravels small and large cobbles cemented with clay pea green and gray	160	170	WB
Gravels boulders and small gravels sand cemented with clay gray	170	185	WB 179'
Gravels boulders clay gray	185	226	WB
Clay green	226	245	WB
Clay gray and green with sand	245	260	
Sandstone coarse fine brown and green matrix	260	279	WB
Silty clay brown	279	290	WB
Gravel slightly cemented with clay brown	290	306	WB
Sandstone with gravel and some clay brown	306	322	WB
Gravel medium small with clay gray	322	330	WB
Gravel with silt lenses gray and brown	330	335	WB
Gravels large to small cemented with sand and clay gray and brown matrix	335	373	
Gravels large to small cemented with more clay matrix brown and gray	373	380	

STATE OF OREGON
WATER WELL REPORT
 (as required by ORS 537.765)

MULT
 3104

RECEIVED

JUL 28 1992

(START CARD) # 37319

W/3E/27c

(1) OWNER: Well Number 6-NEW
 Name CITY OF FAIRVIEW
 Address 300 HARRISON ST.
 City FAIRVIEW State OR Zip 97024

(2) TYPE OF WORK:
 New Well Deepen Recondition Abandon

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable
 Other

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Other

(5) BORE HOLE CONSTRUCTION:
 Special Construction approval Yes No Depth of Completed Well 314 ft.
 Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			Amount sacks or pounds
Diameter	From	To	Material	From	To	
24	0	28	CEMENT	0	157	209
16	28	100				
14	100	157				
10	157	322				

How was seal placed: Method A B C D E
 Other

Backfill placed from _____ ft. to _____ ft. Material _____
 Gravel placed from 188 ft. to 314 ft. Size of gravel 6-9 & 10-20 GCS

(6) CASING/LINER:

Casing/Liner	Diameter	From	To	Gauge	Material			
					Steel	Plastic	Welded	Threaded
Casing:	10	+2	200	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	10	301	322	.365	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) 322

(7) PERFORATIONS/SCREENS:
 Perforations Method V-WIRE
 Screens Type JOHNSON Material STAINLESS

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
201	216	.060		6"	P/S	<input type="checkbox"/>	<input type="checkbox"/>
236	256	.060		6"	P/S	<input type="checkbox"/>	<input type="checkbox"/>
265	301	.030		5"	P/S	<input type="checkbox"/>	<input type="checkbox"/>
6" BLANK PIPE W/K PACKER FROM 189-201							
6" BLANK PIPE FROM 216-236							
5" BLANK PIPE FROM 256-265							

(8) WELL TESTS: Minimum testing time is 1 hour
 5" TAIL PIPE FROM 301-314

Pump Bailor Air Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
500	56		5/1 hr.
500	60		12 HR
360	45		24 HR

Temperature of Water 56 Depth Artesian Flow Found _____
 Was a water analysis done? Yes By whom COFFEE LABS
 Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
 Depth of strata: _____

(9) LOCATION OF WELL by legal description:
 County MULTNOMAH Latitude _____ Longitude _____
 Township 1N N or S. Range 3E E or W. WM. _____
 Section 27 SW 4 _____
 Tax Lot _____ Lot 7 Block _____ Subdivision SHAES EA
 Street Address of Well (or nearest address) 199 CRESTWOOD ST.

(10) STATIC WATER LEVEL:
102 ft. below land surface. Date 7-3-92
 Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
 Depth at which water was first found 28

From	To	Estimated Flow Rate	SWL
200	300	350-500	102

(12) WELL LOG:
 Ground elevation _____

Material	From	To	SWL
CRUSHED ROCK & DIRT	0	1	
SILTY SOIL	1	7	
SILTY SOIL W/LARGE BOULDERS	7	10	
CEMENTED COBBLES & GRAVEL BRN	10	21	
GRAVEL GREY LOOSLY CEMENTED	21	42	
GRAVEL & COBBLES TIGHTLY CEMTD	42	81	
GRAVEL & CLAY GREY	81	86	
CLAY GREY	86	101	
SANDSTONE BLACK	101	126	
SANDSTONE BLACK W/GRAVEL	126	128	
SANDSTONE BLACK	128	140	
SANDSTONE BLK W/STRKS OF GRN	140	144	
GREY CLAY			
SANDSTONE BLACK	144	157	
SANDSTONE GRAVEL CONGLOMERATE	157	164	
BRN CEMENTED			
SAND BRN	164	165	
SAND & GRAVEL BRN CEMENTED	165	194	
GRAVEL CARAMEL BRN W/SAND GREY	194	201	
BRN W/MICA CEMENTED			
GRAVEL GREY, BRN, TAN W/SAND &	201	207	
MICA LAYERS OF LOOSE & LOOSLY			
CEMENTED.			

Date started _____ Completed _____
 (unbonded) Water Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

Signed Daniel R. Stadel WWC Number 1487
 Date 7-20-92

(bonded) Water Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Steven N. Stadel WWC Number 688
 Date 7-20-92

STATE OF OREGON
WATER WELL REPORT
 (as required by ORS 537.765)

*Mult
3104*

RECEIVED
 JUL 28 1992

1N/3E/27C

WATER RESOURCES DEPT. (START CARD) # 37319

(1) OWNER: Well Number 6-NEW SALEM, OREGON
 Name CITY OF FAIRVIEW
 Address 300 HARRISON ST.
 City FAIRVIEW State OR Zip 97024

(2) TYPE OF WORK:
 New Well Deepen Recondition Abandon

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable
 Other _____

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Other _____

(5) BORE HOLE CONSTRUCTION:
 Special Construction approval Yes No Depth of Completed Well _____ ft.
 Explosives used Yes No Type _____ Amount _____

Diameter	HOLE		Material	SEAL		Amount sacks or pounds
	From	To		From	To	

How was seal placed: Method A B C D E
 Other _____

Backfill placed from _____ ft. to _____ ft. Material _____
 Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
 Perforations Method _____
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Pump Bailer Air Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.

Temperature of Water _____ Depth Artesian Flow Found _____
 Was a water analysis done? Yes By whom _____
 Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
 Depth of strata: _____

(9) LOCATION OF WELL by legal description:
 County MULTNOMAH Latitude _____ Longitude _____
 Township 1N N or S. Range 3E E or W. WM. _____
 Section 27 SW 1/4 _____
 Tax Lot _____ Lot 7 Block _____ Subdivision SHAES F
 Street Address of Well (or nearest address) 199 CRESTWOOD ST.

(10) STATIC WATER LEVEL:
 _____ ft. below land surface. Date _____
 Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
 Depth at which water was first found _____

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
 Ground elevation _____

Material	From	To	SWL
SAND & GRAVEL BRN GREY CEMENTED	207	218	
VERY FINE SILTY SAND W/MICA & SOME GRAVEL TAN	218	226	
FINE TO MED FINE TAN-BRN SAND W/MICA & SOME SILT	226	234	
LARGE COBBLES & GRAVEL CEMENTED W/COURSE ANGULAR SAND & SOME MICA	234	257	
CEMENTED SAND VERY COURSE W/SOME GRAVEL FINE	257	258	
SAND BRN, GREY, WHITE VERY FINE W/SOME SILT	258	263	
GRAVEL SMALL TO MED COURSE GRY BRN W/SAND LOOSLY CEMENTED	263	265	
SAND BRN GRY MED TO FINE W/MICA SOME SILT	265	282	
SAND BRN/GRY MED TO COURSE W/MICA	282	284	
SAND COURSE, ANGULAR W/SMALL GRAVEL CEMENTED	284	287	
GRAVEL & SAND MED COURSE CMTD	287	312	
CLAY GREY SANDY	312	322	

Date started _____ Completed _____

(unbonded) Water Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
 Signed Daniel R. Ansdick WWC Number 1487
 Date 7-20-92

(bonded) Water Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
 Signed Steven N. Stadel WWC Number 688
 Date 7-20-92

NOTICE TO WATER WELL CONTRACTOR
The original and first copy
of this report are to be
filed with the

WATER WELL REPORT

RECEIVED
MAR 7 1973

STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date
of well completion.

MULT
001368

STATE OF OREGON
STATE ENGINEER
SALEM, OREGON

State Well No. W/3E-28
State Permit No. _____

(1) OWNER:

Name City of Fairview
Address 300 Harrison Ave., Fairview, Or., 97024

(2) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Cable Driven Jetted Bored

(4) PROPOSED USE (check):

Domestic Industrial Municipal Irrigation Test Well Other

(5) CASING INSTALLED:

Threaded Welded
16" Diam. from _____ ft. to 360' 9" ft. Gage 312
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

PERFORATIONS:

Perforated? Yes No.

Type of perforator used Star 4 Way (2 runs 8 rows)
Size of perforations 1 1/2 in. by 3/8 in.
960 perforations from 270 ft. to 290 ft.
480 perforations from 330 ft. to 340 ft.
672 perforations from 341 ft. to 355 ft.

(7) SCREENS:

Well screen installed? Yes No

Manufacturer's Name _____ Type _____ Model No. _____
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level Bottner

Was a pump test made? Yes No If yes, by whom? Drilling
1: 324 gal./min. with 53 ft. drawdown after 6 hrs.
508 " 86 " 8 "
" 609 " 103 " 6 "
Ball test 708 gal./min. with 128 ft. drawdown after 4 hrs.
800 g.p.m. 155 24
Temperature of water _____ Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:

Well seal—Material used BENTONITE & CEMENT
Well sealed from land surface to _____ 67 ft.
Diameter of well bore to bottom of seal _____ 20 in.
Diameter of well bore below seal _____ 16 in.
Number of sacks of cement used in well seal _____ 18 sacks
Number of sacks of bentonite used in well seal _____ 2 sacks
Brand name of bentonite BAROID
Number of pounds of bentonite per 100 gallons of water _____ APPROX. 100 lbs./100 gals.
Was a drive shoe used? Yes No Plugs _____ Size: location _____ ft.
Did any strata contain unusable water? Yes No
Type of water? To Sandy depth of strata 248 to 259
Method of sealing strata off Cased
Was well gravel packed? Yes No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:

County Multnomah Driller's well number _____
1/4 1/4 Section 28 T. 1N R. 3E W.M. _____
Bearing and distance from section or subdivision corner _____

(11) WATER LEVEL: Completed well.

Depth at which water was first found _____ 98 ft.
Static level 96 ft. below land surface. Date 2/14/73
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:

Diameter of well below casing Cased to bottom
Depth drilled 360 ft. Depth of completed well 360 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Top Soil	0	4	
Boulders	4	21	
Gravel, loose	21	25	
Gravel, cemented	25	92	
Clay, brown	92	98	
Sand, black	98	105	38
Clay, yellow	105	112	
Clay, blue	112	125	
Gravel, cemented	125	172	
Gravel with sand	172	191	
Gravel, cemented & bldrs.	191	248	
Sand, brown	248	259	
Gravel & gray sand w. brng.	259	296	
Sand, brown & gravel	296	312	
Rock	312	314	
Sand, black	314	324	
Gravel & sand (water at 324)	324	329	
Gravel, large w/ brown sand	329	360	104

Work started August 16 19 72 Completed Feb. 14 19 73
Date well drilling machine moved off of well Feb. 15 19 73

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] Earl V. Baber Date 3-2, 19 73
(Drilling Machine Operator)

Drilling Machine Operator's License No. 190

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name HAAKON BOTTNER DRILLING COMPANY
(Person, firm or corporation) (Type or print)

Address 3424 S.E. 174 AV., PORTLAND, OR.

[Signed] Haakon Bottner
(Water Well Contractor)

Contractor's License No. 109 Date March 3rd, 19 73

IN/3-27M(1)
MULT.



CITY OF FAIRVIEW
OREGON

NURSERIES, FRUIT AND DAIRYING INDUSTRIES

July 18, 1958

State Engineer
Salem, Oregon

STATE ENGINEER
SALEM, OREGON

Attention: Jack Sceva, Geologist

Dear Mr. Sceva:

In reply to your letter bearing file #G-529 in regards to re-perforating our well by Hakkon Bottner.

Mr. Bottner re-perforated this well with 765 perforations. Perforating was done between the 275 foot and 340 foot levels.

Test Pumping was done over a two day period with the following results:

Static water level before re-perforation-----	93 feet
Static water level after re-perforation-----	87 feet
340 G.P.M. - - -	-11 foot draw down
380 G.P.M. - - -	-13 " " "
430 " - - -	-15 " " "
480 " - - -	-17 1/2 " " "
580 " - - -	-22 1/2 " " "
780 " - - -	-38 " " "
850 " - - -	-45 " " "

850 G.P.M. was the capacity of the test pump used by Mr. Bottner

Enclosed find Form B and Form C, covering completion and application of this well.

Sincerely

Thomas L. Shaw
Water Superintendent

1N/3E-27M(1) RECEIVED
 SEP 10 1956
 STATE ENGINEER
 SALEM, OREGON

0	to 5	Clay
5	10	boulders
10	20	shot boulders, gravel caving
20	25	gravel
25	36	"
36	59	"
59	77	cement, gravel
77	83	" "
83	105	Blue silt, surface water shot off

105	to 125	river silt
140	175	cement, gravel
175	185	" " , hole caving
185	203	" "
203	265	silt
265	280=	Clean gravel, doesn't show much water
280	300=	Gravel
300	320	tight clean gravel, pipe driving slow
320	345	gravel muddy
345	360=	cement gravel
360	370	yellow clay, some sand
370	380	sandy yellow clay=
380	400	fine sand, pipe going good
400	420	sand keeps heaving
420	445	corse rock
445	455	sandy silt can't get ahead of pipe
455	465	" " , driving pipe
465	495	" "
495	520	heaving sand
520	535	" "
535	540	blue shale
540	550	black sand
550	560	" " , heaving pipe
560	575	sand, some gravel
575	600	white fine sand still heaving
600	630	fine flower sand
630	670	" silk sand
670	690	fine sand, gravel
690	705	fine sharp sandy rock
705	715	blue shale
715	725	fine sand
735	745	sandy small gravel caving
745	755	" gray clay
755	760	yellow clay
760	789	" "
789	800	" "
800	810	hard gray rock
810	820	broken rock, clay in at
826	850	hard black rock
860=	875	hard rock blue clay
890	900	black rock
900	910	blue clay
910	915	" "
915	920	gray rock
920	935	blue clay
935	937	hard shell
937	950	clay
950	965	hard clay sand rock
965	975	hard gray sand shows water
975	980	hard sand, some rock in it
980	992	" " " " " "
992	998	hard sand

998 to 1000 pink shale sand
1000 1002 red clay
1002 1015 broken rock
1015 1020 hard sand
1020 1030 broken rock, drilling muddy
1030 1045 " blue clay
1045 1060 gray sand, clay

STATE ENGINEER
Salem, Oregon

MULT Well Record
001363

STATE WELL NO. 1N/3-27M
COUNTY MULTNOMAH
APPLICATION NO.

OWNER: City of Fairview

MAILING ADDRESS:

LOCATION OF WELL: Owner's No.

CITY AND STATE:

1/4 1/4 Sec. T. N. E. S., R. W., W.M.

Bearing and distance from section or subdivision corner

Altitude at well 130

TYPE OF WELL: Drilled Date Constructed

Depth drilled 1,060 Depth cased 830

Section

CASING RECORD:

12 inch

FINISH:

AQUIFERS: Gravel, Troutdale Formation, from 265 to 345
Sandstone from 967 to 975

WATER LEVEL: 92.7 feet below land surface on July 30, 1958

PUMPING EQUIPMENT: Type H.P.
Capacity G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Public Supply Temp. °F., 19

SOURCE OF INFORMATION USGS

DRILLER or DIGGER

ADDITIONAL DATA:

Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

Pumped 400 gpm.
Perforated 320-340 feet.

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-27M
County MULTNOMAH
Application No. _____

Well Log

Owner: City of Fairview Owner's No. _____

Driller: Barron & Strayer Date Drilled 1956

CHARACTER OF MATERIAL	(Feet below land surface)		Thickness (feet)
	From	To	
<u>Troutdale Formation:</u>			
<u>Clay</u>	<u>0</u>	<u>5</u>	<u>5</u>
<u>Boulders and gravel</u>	<u>5</u>	<u>20</u>	<u>15</u>
<u>Gravel</u>	<u>20</u>	<u>59</u>	<u>39</u>
<u>Gravel, cemented</u>	<u>59</u>	<u>83</u>	<u>24</u>
<u>Clay, blue</u>	<u>83</u>	<u>105</u>	<u>22</u>
<u>Silt</u>	<u>105</u>	<u>125</u>	<u>20</u>
<u>Gravel, sandy, water-bearing</u>	<u>125</u>	<u>140</u>	<u>15</u>
<u>Gravel, cemented; bottom of 12-in. casing at 182 feet.</u>	<u>140</u>	<u>203</u>	<u>63</u>
<u>Silt</u>	<u>203</u>	<u>265</u>	<u>62</u>
<u>Gravel, clean</u>	<u>265</u>	<u>320</u>	<u>55</u>
<u>Gravel, muddy</u>	<u>320</u>	<u>345</u>	<u>25</u>
<u>Gravel, cemented, static water level 110 ft.</u>	<u>345</u>	<u>360</u>	<u>15</u>
<u>Sandy River Mudstone (?):</u>			
<u>Clay, yellow, sandy</u>	<u>360</u>	<u>380</u>	<u>20</u>
<u>Sand, fine, "heaving"</u>	<u>380</u>	<u>420</u>	<u>40</u>
<u>"Rock" (gravel?), coarse</u>	<u>420</u>	<u>445</u>	<u>25</u>
<u>Silt, sandy</u>	<u>445</u>	<u>495</u>	<u>50</u>
<u>Sand, heaving</u>	<u>495</u>	<u>535</u>	<u>40</u>
<u>Shale, blue</u>	<u>535</u>	<u>540</u>	<u>5</u>
<u>Sand, black</u>	<u>540</u>	<u>560</u>	<u>20</u>
<u>Sand, some gravel</u>	<u>560</u>	<u>575</u>	<u>15</u>
<u>Sand, fine, white; static water level dropped</u>			

(Continued)

Continued--
STATE ENGINEER
Salem, Oregon

State Well No. LN/3-27M1
 County _____
 Application No. _____

Well Log

Owner: City of Fairview Owner's No. _____

Driller: _____ Date Drilled _____

CHARACTER OF MATERIAL	(Feet below land surface)		Thickness (feet)
	From	To	
to 120 ft. at 585-ft. depth	575	625	50
Gravel, water-bearing	625	626	1
Sand, fine, white	626	670	44
Sand, fine, and gravel	670	690	20
Sandstone, hard, "sharp"	690	705	15
Shale, blue	705	715	10
Sand, fine	715	735	20
Gravel, small, sandy, caving	735	745	10
Clay, gray, sandy	745	755	10
Clay, yellow; bottom of 10-in. casing at 800-ft. depth	755	800	45
Columbia River Basalt:			
Rock, gray, hard; open 10-in. hole below 800-ft. depth:	800	810	10
Rock, broken	810	826	16
Clay	826	827	1
Rock, black, hard	827	850	23
Rock, hard, some blue clay	850	875	25
Rock, black	875	900	25
Clay, blue	900	915	15
Rock, gray	915	920	5
Older rocks:			
Clay, blue; static water level 90 ft.	920	935	15
"Shell," hard	935	937	2

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report
are to be filed with the

RECEIVED

WATER WELL REPORT

WATER RESOURCES DEPARTMENT
SALEM, OREGON 97310
within 30 days from the date
of well completion

APR 8 1980

STATE OF OREGON
(Please type or print)

MULT
002418

State Well No. 1s/3E-27 da
State Permit No.

WATER RESOURCES DEPT
SALEM, OREGON

(1) OWNER:

Name City of Wood Village
Address Multnomah County, Oregon

(2) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Driven
Cable Jetted
 Bored

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) CASING INSTALLED:

12 " Diam. from 0 ft. to 200 ft. Gage 375
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:

Perforated? Yes No.

Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:

Well screen installed? Yes No

Manufacturer's Name Johnson
Type stainless steel Model No.
Diam. 10P Slot size .250 Set from 200 ft. to 230 ft.
Diam. 10P Slot size .250 Set from 245 ft. to 255 ft.
10P .250 270 280

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made Yes No. If yes, by whom? Aqua Pump
d: 250 gal./min. with 20 ft. drawdown after 1/2 hrs.
350 " 26 " 3/2 "
" 500 " 57 " 24 hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Well seal—Material used cement
Well sealed from land surface to 22 inch 25 feet ft.
Diameter of well bore to bottom of seal 16 inch 25 feet ft.
Diameter of well bore below seal 12 in. & 16 in.
Number of sacks of cement used in well seal 58 sacks
How was cement grout placed? pressure pumped

Was a drive shoe used? Yes No Plugs Size: location ft.
Did any strata contain unusable water? Yes No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? Yes No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:

County Multnomah Driller's well number D 280-80
N E 1/4 S E 1/4 Section 27 T. 1S R. 3E W.M.
Bearing and distance from section or subdivision corner
1510 feet N. 1290 feet W of SE corner

(11) WATER LEVEL: Completed well.

Depth at which water was first found 15 ft.
Static level 98 ft. below land surface. Date 4/8/80
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing 12
Depth drilled 300 ft. Depth of completed well 300 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
topsoil	0	2	
clay brown & sandy	2	14	
gravel water bearing	14	16	
gravel cemented	16	28	
gravel, sand boulders	28	60	
gravel & sand cemented	60	110	
sand & gravel	110	135	
gravel & sand water/b	135	230	
sand brown water bearing	230	245	
gravel & sand water/b	245	257	
sand brown fine	257	270	
claystone gray water/b	270	285	
clay gray	285	300	

Work started 1/3/80 19 Completed 3/28/80 19
Date well drilling machine moved off of well 4/8/80 19

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] *Don Brown* Date 4/8/80, 19
(Drilling Machine Operator)

Drilling Machine Operator's License No. 1306

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name S & M Drilling & Supply Inc.
(Person, firm or corporation) (Type or print)

Address 399 S E Walnut Canby, Ore 97013

[Signed] *Walter Mac*
(Water Well Contractor)

Contractor's License No. 497 Date 4/8/80, 19

NOTICE TO WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

RECEIVED WATER WELL REPORT DATE OF OREGON FEB 5 1970

MULT

1N/3-356d

STATE ENGINEER, SALEM, OREGON 97310

(Please type or print)

State Well No.

within 30 days from the date of well completion.

STATE ENGINEER SALEM, OREGON

Do not write above this line

001431

State Permit No.

(1) OWNER:

Name CITY OF WOOD VILLAGE Address 2055 NE 238th DR, TROUTDALE, ORE.

(2) TYPE OF WORK (check):

New Well [X] Deepening [] Reconditioning [] Abandon []

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary [] Cable [X] Driven [] Jettied [] Bored []

(4) PROPOSED USE (check):

Domestic [] Industrial [] Municipal [X] Irrigation [] Test Well [] Other []

CASING INSTALLED:

12" Diam. from 0 ft. to 458 ft. Gage 330

PERFORATIONS:

Perforated? [X] Yes [] No. Type of perforator used STAR Size of perforations 3/8 in. by 1/4 in. 400 perforations from 439 ft. to 449 ft.

(7) SCREENS:

Well screen installed? [] Yes [X] No Manufacturer's Name Type Model No. Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.

Static level 250 ft. below land surface Date 12/29/69

(9) WELL TESTS:

Drawdown is amount water level is lowered below static level Was a pump test made? [X] Yes [] No If yes, by whom STRASSER Yield: 313 gal./min. with 83 ft. drawdown after 24 hrs. 200 " 57 " 25 " 490 " 166 " 8 " Bailer test gal./min. with ft. drawdown after hrs. Artesian flow g.p.m. Date Temperature of water 54 degrees Was a chemical analysis made? [X] Yes [] No

(10) CONSTRUCTION:

Well seal—Material used CEMENT GROUT Depth of seal FROM SURFACE TO 61 ft. Diameter of well bore to bottom of seal 16 in. Were any loose strata cemented off? [] Yes [X] No Depth Was a drive shoe used? [X] Yes [] No Did any strata contain unusable water? [] Yes [X] No Type of water? depth of strata Method of sealing strata off Was well gravel packed? [] Yes [X] No Size of gravel: Gravel placed from ft. to ft.

(11) LOCATION OF WELL:

County MULT. Driller's well number 5231 SE 1/4 NW 1/4 Section 35 T. 1N. R. 3E. W.M. Bearing and distance from section or subdivision corner

(12) WELL LOG:

Diameter of well below casing 12 Depth drilled 546 ft. Depth of completed well 458 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

Table with columns: MATERIAL, From, To, SWL. Rows include GRAVEL AND BOULDERS, GRAVEL AND BROWN CLAY, BROWN SAND AND CLAY, CEMENTED GRAVEL, etc.

Work started SEPT 18 1969 Completed FEB 2 1970 Date well drilling machine moved off of well FEB 3 1970

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] Donald Johnson Date FEB 4, 1970 (Drilling Machine Operator)

Drilling Machine Operator's License No. 56

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME R.L. STRASSER DRILLING CO (Person, firm or corporation) (Type or print)

Address 8110 SE SUNSET LANE PORTLAND ORE

[Signed] Robert L. Strasser (Water Well Contractor)

Contractor's License No. 10 Date FEB 4, 1970

STATE ENGINEER
Salem, Oregon

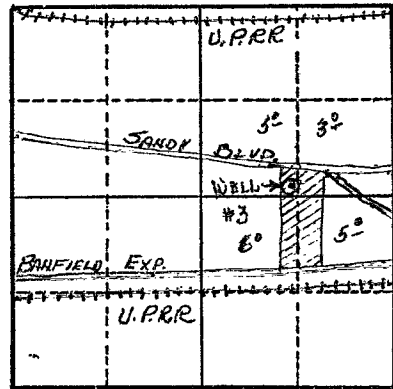
MULT Well Record
001384

STATE WELL NO. 1N/3-28G
COUNTY Multnomah
APPLICATION NO. GR-1440

OWNER: Fairview Farms Inc.
LOCATION OF WELL: Owner's No. #3
MAILING ADDRESS: Rt. 2, Box 40
CITY AND STATE: Troutdale, Oregon

SW 1/4 NE 1/4 Sec. 28 T. 1 N. 8, R. 3 E. W., W.M.

Bearing and distance from section or subdivision corner For location see sketch on map



Section 28

Altitude at well 85'

TYPE OF WELL: Drilled Date Constructed 1954

Depth drilled 151' Depth cased 151'

CASING RECORD:

8"

FINISH:

10 rows of perforations from 139 to 149 ft.

AQUIFERS:

WATER LEVEL:

68'

PUMPING EQUIPMENT: Type Peerless turbine H.P. 15

Capacity 275 G.P.M.

WELL TESTS:

Drawdown 9 ft. after 200 hours G.P.M.

Drawdown 16 ft. after 300 hours G.P.M.

USE OF WATER Dom. & Irrigation Temp. °F., 19

SOURCE OF INFORMATION GR Record

DRILLER or DIGGER

ADDITIONAL DATA:

Log Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

Log: Clay & boulders 0 to 14 ft.
Large cemented gravel 14 to 30 ft.
Gravel with clay binder 30 to 52 ft.
Cemented gravel & sand & gravel & clay 52 to 80 ft.
Cemented gravel 80 to 139 ft.
Loose gravel & sand (water) 139 to 151 ft.

Irrigation of 17 acres.

RECEIVED
MAR 28 1958
STATE ENGINEER
SALEM, OREGON

Registration No. GR. - 1440

Certificate No. GR. - 1586

Registration Statement

OF CLAIMANT OF RIGHT TO APPROPRIATE GROUND WATER

TO THE STATE ENGINEER OF OREGON:

I, FAIRVIEW FARMS INC

of Rt 2 BOYHO TRAILDALE

County of MULT.

State of OREGON

do hereby make application for a certificate of registration as evidence of a right to appropriate ground water.

1. Source from which water is withdrawn is PUMP WELL #3
(Flowing well, pump well, infiltration trench, or tunnel)

2. Location is: 1/2 MILE WEST OF CITY OF FAIRVIEW
(Approximate distance and direction from nearest city or town)

and is more particularly described as follows:

(a) 3000 FT SW 1/4 INTERSECTION OF SEC 21-22-27-28
(Give distance and bearing to corner of section or other legal subdivision)

being within SW 1/4 of NE 1/4 of Sec. 28, Twp. 1N Rge. 3E
(Smallest legal subdivision) (N. or S.) (E. or W.)

or (b) within limits of recorded platted property, town or city:

in Lot _____, Block _____ of _____
(Name of plat or addition)

County of Multnomah
(If within city or town, give name)

3. Construction Work was begun on AUGUST 1954; was completed on AUG 2 - 1954
(Date) (Date)

and the ground water claimed was first used for the purposes set out below on SEPT 1954
(Date)

since which time the water has been used DOMESTIC AND IRRIGATION CONTINUOUSLY
(Continuously or intermittently) & MANUFACTURING

from SEPT 1954 to JAN 1958
(Date) (Date)

4. Quantity of water claimed and used is 200 gallons per minute; _____ acre feet per year.

5. Purpose or Purposes for which water is used _____

DOMESTIC AND IRRIGATION
(Domestic, irrigation, municipal, manufacturing, industrial, etc.)

6. Description of Well: Depth 151 feet. Type DRAINED
(Dug or drilled)

diameter 8" inches. Elevation of ground at well site 15 feet, mean sea level.
(As near as known)

Depth to water table 68 feet.

7. Capacity of Well: 200 g.p.m. with 9 feet drawdown.

300 g.p.m. with 16 feet drawdown.

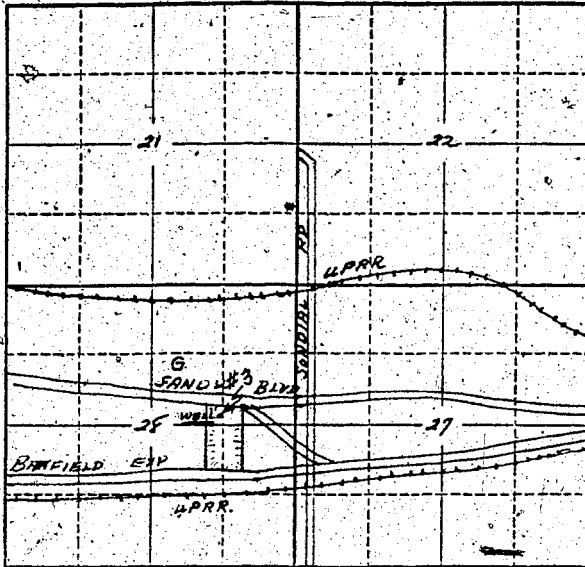
Date of test AUG - 1958

If Flowing Well: Measured discharge _____ g.p.m. on _____
(Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____
(Date)

Water is controlled by _____
(Cap, valve, etc.)

Township 1N Range 3E W.M.
North



Locate well and acreage of irrigated land on plat.

Scale: 2" = 1 Mile

STATE OF OREGON

County of Multnomah } ss.

I, Sophie George, being first duly sworn, do hereby certify that I have read the foregoing Registration Statement and that all of the items therein contained are true to the best of my knowledge and belief.

Fairview Farms, Inc.
Secretary
(Signature of Registrant)

Subscribed and sworn to before me this 21st day of March, 1955.

My commission expires 3-7-62

P. J. James
(Notary Public)

(SEAL)

CERTIFICATE OF REGISTRATION

STATE OF OREGON

County of Marion } ss.

This is to certify that the foregoing Registration Statement was received in the office of the State Engineer on the 18th day of April, 1958, at 4:00 o'clock P. M. and has been duly recorded in said office in Book No. 7 of Registration Statements on page GR-1586

Witness my hand this 1st day of December, 1958

Lewis A. Stanley
(State Engineer)

By _____ (Deputy)

GR-1586

\$25.00