Milton-Freewater Aquifer Storage and Recovery Feasibility Study Phase 1

Prepared for

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Milton-Freewater, Oregon 98762

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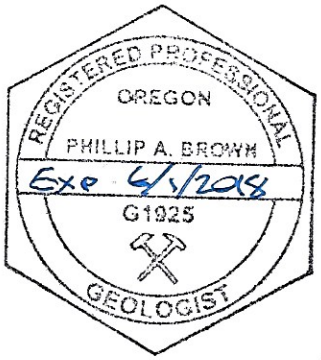

Phil Brown, RG
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5/2/2018
Date

April 24, 2018

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Date

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TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

ADD	Available drawdown
AR/ASR	Aquifer Recharge/Aquifer storage and recovery
AR	Aquifer recharge
ASR	Aquifer storage and recovery
bgs	Below ground surface
City	City of Milton-Freewater
CRBG	Columbia River Basalt Group
DEM	Digital elevation model
DD	Drawdown
EA	EA Engineering, Science, and Technology, Inc., PBC
FS	Feasibility study
ft	Feet (foot)
gpm	Gallon(s) per minute
gpm/ft-DD	Gallon(s) per minute per ft of drawdown
in.	Inch(es)
MAR	Managed Aquifer Recharge
mgd	Million gallon(s) per day
NAVD88	North American Vertical Datum of 1988
N/A	Not available
NTU	Nephelometric turbidity unit
NWGS	Northwest Groundwater Services, LLC
O&M	Operation and Maintenance
OHA	Oregon Health Authority
OWRD	Oregon Water Resource Department
PTW	Pump to Waste
RBF	River Bank Filtration
SC	Specific capacity
SWL	Static Water Level
WTP	Water Treatment Plant
WW	Walla Walla
WWBWC	Walla Walla Basin Watershed Council

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1. INTRODUCTION

This report provides EA Engineering, Science, and Technology, Inc., PBC's (EA), Northwest Groundwater Services, LLC (NWGS), and Murraysmith's evaluation of the source water availability and treatment options for a potential aquifer recharge/aquifer storage and recovery AR/ASR system in Milton-Freewater, Oregon. This project is a collaboration between the Walla Walla Basin Watershed Council (WWBWC) and the City of Milton-Freewater (City) who received funding from the Oregon Water Resource Department (OWRD) Feasibility Study (FS) grant program.

A note on terminology: this project is designed to assess the feasibility of using the City's infrastructure (water rights, property, conveyance, and wells) to enhance recharge (i.e. increase water storage) in the basalt aquifer system beneath and near the City. Critical elements in achieving this are to legally acquire available surface water, treat it to acceptable standards, and inject it into the subsurface. If that water is then left in the aquifer to benefit the City, other users, and the surface water resource (by creating a sustainable alternative to summer surface water withdrawals) if is referred to as AR, or Artificial Recharge. If it is recovered by wells and put to beneficial use as drinking water the practice is known as ASR (Aquifer Storage and Recovery). There are significant differences in water treatment requirements between and AR and ASR, and the City will elect which permitting and treatment pathway best suits its need as the project evolves. For this first phase of the Feasibility Study, we will use a shorthand AR/ASR abbreviation.

OWRD has recently classified the basalt aquifer system in the Oregon portion of the Walla Walla Subbasin as a Serious Water Management Problem Area based on declining water levels. Eventually, this may be the first step in reducing withdrawals from the basalt aquifer as a means to make continued use sustainable. The WWBWC and the City understand that negative socioeconomic consequences could result from curtailed use and are exploring the potential to achieve aquifer sustainability through enhancing aquifer recharge rather than curtailing of junior water rights.

In this first phase of the Milton-Freewater AR/ASR assessment, this report focuses on assessing select project elements; source water availability and source treatment options. The City is interested in exploring the potential to usd its municipal water rights for the Walla Walla (WW) River to divert river water for AR/ASR and potentially delivering it to the City system via the existing distribution infrastructure. The point of diversion may be an in-stream location, a shallow induced-infiltration well, or an engineered collection system pumping groundwater in direct hydraulic connection with the Walla Walla River. The suitability of diversion, treatment, injection/recovery, and distribution and delivery systems for the preferred and other alternatives are ranked in this report and they will be reviewed with the WWBWC and the City to determine the path forward. This report, in conjunction with in-stream flow analysis will be used by the WWBWC and the City to determine their preferred path forward. The goal of this study is to provide the City and WWBWC with a clear understanding of the planning-level cost, benefits, and development pathway for AR/ASR implementation.

2. BACKGROUND

AR/ASR projects in the Columbia Basin typically target Columbia River Basalt Group (CRBG) aquifers for drinking water supply or irrigation. These AR/ASR systems store treated surface water or shallow alluvial aquifer groundwater in the deeper CRBG aquifer system to restore water levels and/or for later recovery. Key permitting elements to support OWRD's decision to issue either an AR or ASR limited license and permit (Oregon Administrative Rules 690-350) include characterizing the aquifer, identifying users, evaluating potential impacts, determining water availability, describing land use and the water rights framework, and characterizing source and receiving (groundwater) water quality.

For this phase of the FS, the City is focusing on basic program development plans that focus on City infrastructure, diversion options, water quality, water availability, and treatment requirements. The project is organized into four assessment tasks:

- ***Task 1*** – Existing Well, Intake, Treatment, and Distribution Infrastructure.
- ***Task 2*** – Diversion Options.
- ***Task 3*** – Water Treatment Alternatives.
- ***Task 4*** – Water Availability.

This report presents the combined results of the Task 1 and Task 2 assessments. Task 3 will be completed after 2018 winter sampling to characterize water quality in the Walla Walla River. Task 4 is scheduled for completion later in 2018.

3. TASK 1 – INFRASTRUCTURE ASSESSMENT

The purpose of this task is to develop an AR/ASR implementation plan based on an assessment of the City's infrastructure; municipal supply wells, piping and distribution, waste discharge options, diversion locations, and water treatment site availability. The project team met to exchange information and inspect key elements of the City's water distribution system on 15 August 2017. During this meeting the project team inspected on-the-ground well conditions and features at Wells #1, #5, #8, and #9. This section summarizes the findings from that visit and subsequent document review and uses these to rank the City's wells for potential future AR/ASR use.

3.1 CITY WATER SUPPLY WELLS

The objective of this section is to discuss the characteristics of the City's basalt wells. The City currently has water rights to eight municipal water wells being considered for recharge operations (**Figure 1**). Water right details of each well can be found in the City's Water Management and Conservation Plan Update Addendum (Anderson Perry & Associates 2011). Wells #1 and #2 are near a former fruit packing/processing plant near the Little Walla Walla River diversion. Wells #3 and #6 are located in the downtown area of the City adjacent to the Little Walla Walla River. Well #5 also is adjacent to the Little Walla Walla, next to a parking lot near an industrial warehouse facility. The Key well is near Well #5, approximately 600 feet to the northeast. Wells #8 and #9 are upstream of downtown. Well #8 is located at Marie Dorion Park on the mainstem Walla Walla River near an old power generating facility. Well #9 is located on top of the bluff slightly north of Well #8. Additional location details are discussed in Section 3.3.1.

The City draws water from seven basalt wells, Wells #1, #2, #3, #5, #6, #8, and #9. Well #8 is known to be the least efficient well and also the deepest (Anderson Perry & Associates 2010). Well #9 exhibits indications of biofouling and is only used on a limited basis. **Table 1** provides a summary of well location details. **Tables 2** and **3** respectively, tabulate well construction and hydrologic information for the City's wells. **Appendix A** provides the available water right information for each well. Well #4 has been removed and will not be considered below.

The Key well is a former industrial/potable supply well adjacent to a former fruit packing facility near City Well #5. The City acquired this property and well, which is currently unused. The Key well originally exhibited a very high specific capacity, which may allow ASR use without lowering the pumping water level significantly below the bottom of casing. The original static water level was above the base of casing and if current water levels are similar, then this well would have several advantages including; 16" casing dimeter, high specific capacity, proximity to the industrial sewer system, and ability to retrofit without disrupting current City supply operations. Because this well is not connected to the City's municipal supply, it has the ability to provide non-potable supply for things like industrial use, municipal irrigation, or potentially golf course irrigation which could reduce or eliminate a surface water diversion and increase summer surface water flows.

Table 1 Municipal Well Location Summary

City Well ID	Well Log ID:1	Well Log ID:2	Latitude	Longitude	1/4 1/4	1/4	Section	Township	Range
Well #1	UMAT3961	UMAT3960 UMAT5999	45.93	-118.38	—	SW	12	5	35
Well #2	UMAT3962	—	45.93	-118.39	SE	NW	12	5	35
Well #3	UMAT3930	UMAT3924	45.94	-118.39	NE	SE	2	5	35
Well #5	UMAT3909	—	45.94	-118.39	SW	NW	1	5	35
Well #6	UMAT3923	UMAT 3929	45.94	-118.41	NE	SW	2	5	35
Well #8	UMAT4005	UMAT4010 G13488	45.91	-118.37	SW	SW	18	5	36
Well #9	UMAT3965	UMAT51825	45.92	-118.38	SW	SE	12	5	35
Key Well	UMAT3908	—	45.56	-118.23	SW	NW	1	5	35

Notes:
ID:1 = Original well log.
ID:2 = The second log provided due to well modifications; Wells #1, #3, and #8 were deepened and Well #9 had a liner installed.

Table 2 Well Construction Details

City Well ID	Date Drilled	Ground Elevation [1]	Total Depth (ft)	Casing Diameter (inches)	Casing Depth (ft)	Seal Depth (ft)	Static Water Level (ft, bgs)	Static Water Level Date	Available Drawdown (ft) [2]	Top of Basalt (ft)	Feet of Casing Below Top of Basalt (ft)
Well #1	3/1/1938	1066.6	656	12	84	84	235	1998	-151	46	38
Well #2	10/10/1945	1064.8	902	16[3]	99	99?	225	7/25/2017	-126	70	29
Well #3	12/28/1946	1010.6	575	16	100	43	173	7/11/2017	-73	40	60
Well #5	1/1/1936	1001.6	502	12	212	N/A	195	7/18/2017	17	160	52
Well #6	12/22/1950	983.6	952	12	232	232	257	8/15/2017	-25	55	177
Well #8	4/14/1965	1168.6	1051	16	480	78	291	1997	189	31	449
Well #9	6/22/1951	1156.4	870	12	462	290	323	7/18/2017	139	41	421
Key Well	2/16/1945	1001.6	528	16	109	109	71	12/27/1954	38	92	17

[1]Elevation data was obtained from the Oregon Department of Forestry, 10M Digital Elevation Model http://jollyroger.science.oregonstate.edu/dem/). Metadata indicate NAVD88 is the vertical datum.
[2]Available drawdown calculation is casing depth (ft below ground surface; ft bgs) minus Static Water Level (ft bgs).
[3]Log does not have diameter noted. However, notes 12-inch pump installed so 16-inch diameter is assumed.
Notes:
ft = Feet
gpm = Gallon(s) per minute
gpm/ft = Gallon(s) per minute per foot of drawdown
ID = Identification
N/A = Not available
NAVD88 = North American Vertical Datum of 1988

Table 3 Hydrogeologic Properties

City Well ID	Total Depth (ft)	Static Water Level (ft)	SWL Date	Flow Rate (gpm)	Pump Test Drawdown (ft)	Pump Test Date	Specific Capacity (gpm/ft)	Maximum Pumping Rate[1] (gpm)
Well #1	656	235	1998	1484	182	N/A	8.2	0
Well #2	902	225	7/25/2017	1135	88	N/A	12.90	0
Well #3	575	173	7/11/2017	N/A	N/A	N/A	N/A	N/A
Well #5	502	195	7/18/2017	750	47	1/1/1936	16.0	271
Well #6	952	257	8/15/2017	1500	145	2/29/1972	10.3	0
Well #8	1051	291	1997	1529	197	2/2/1970	7.8	1467
Well #9	870	323	7/18/2017	1501	295	8/17/1951	5.1	707
Key Well[2]	528	49	2/16/1945	1550	32	2/16/1945	48.4	1841

Notes:
[1]Maximum pumping rate calculation is specific capacity (gpm/ft) multiplied by available drawdown (ft). Zero values are where static water level is below the base of the casing.
[2]The pump test conducted was a step-rate test so the last recorded flow rate and water level were used to calculate this specific capacity. Note – current static water levels and performance need to be confirmed.
ft = Feet
gpm = Gallon(s) per minute
gpm/ft = Gallon(s) per minute per foot of drawdown, at time of test
ID = Identification
N/A = Not available

3.2 WELL RANKING CRITERIA

The City wells were evaluated against a series of screening critieria used to prioritize their potential for conversion to recharge operations. These screening criteria include:

- Specific Capacity
- Well Age
- Casing Diameter
- Available Drawdown
- Waste Discharge Options
- Top of Basalt

These are discussed further below.

Specific capacity (SC), expressed in gallons per minute pumped per foot of pumping drawdown (gpm/ft-DD), is a measurement of a well's ability to transmit water in and from the portion of the

aquifer system the well intersects. A higher SC well will allow a larger volume of water to be injected and recovered over the same period as a well with lower SC.

— ***Result:*** Based on the available pumping rates (typically measured when the well is installed), the wells with the highest SC are the Key Well at 48.4 gpm/ft, Well #5 with 16.0 gpm/ft, Well #2 at 12.9 gpm/ft, and Well #6 at 10.3 gpm/ft (**Table 3**). The maximum pumping rate based on existing data were calculated for each well to access long term pumping rates. Well #5 and the Key Well depending on the target pumping/injecting rates desired could be good options. The remaining wells either have water levels below the casing which make them less desirable or there is not enough information to make an evaluation. We recommend conducting an aquifer test (Section 6) at any preferred well to assess the current conditions (i.e. specific capacity, available drawdown, etc.) to assess long term reliability of the final well selected.

Well Age—When converting an existing well to a recharge well, it is important to understand the age of the well and construction design. It is generally assumed that newer wells are more likely to have compliant well seals; therefore, newer wells are preferred. Regardless, a downhole video survey is recommended at each well prior to conversion to recharge use to assess the condition as a first step. Plumb/alignment testing may also be indicated to evaluate whehter lowering a pump intake or installing downhole flow control is recommended and feasible.

— ***Result:*** Well #8 is the newest municipal well installed in 1966 followed by Well #9 in 1951 and Well #6 in 1950 (**Table 2**).

Casing Diameter—The diameter of the casing can play a role in how efficiently a well can transmit water into or out of an aquifer. Generally, a larger casing diameter results in a more efficient well in which water more easily moves into and out of the well bore. More importantly, conversion to a recharge well will likely require installation of a downhole control valve and monitoring conduit, which will increase the diameter of the pump column. Therefore, larger casing diameter is preferred for ease of installation and maintaining maximum rates/volumes with properly sized pumping equipment. The City's wells vary in diameter from 8 to 16 inches (in.) (**Table 2**).

— ***Result:*** Wells #2, #3, #8, and the Key well have 16-inch diameter casing, the largest available with the City's wells. Wells #1, #5, #6, and #9 have 12-in. casing diameters so could likely support a system pumping targeting at least 1,000 gpm.

Available Drawdown (ADD)—The ADD is the difference between the bottom of the casing and the SWL. This criterion is used to identify wells that will allow buildup and DD to occur within the casing to protect the pumping equipment and limit the potential for cascading water or exchange with currently unsaturated permeability. Cascading water and aeration of the water column is a common cause of diminished well production as aeration sets up conditions promoting biological and sometimes chemical fouling of the well. Conversely, during injection

when water level in a well rises, it is best to avoid a condition where water is exchanged with unsaturated fractures. Introducing aerated water to into a previously unsaturated subsurface environment has the potential to promote unwanted biological and chemical reactions, and the potential for lost water. The greater the depth of the bottom of casing is below the SWL the better chances of avoiding these unwanted conditions. Although it may be possible to conduct ASR operations with all water levels below the base of casing, it would require additional evaluation to assess the potential for lost water or degraded quality, and the City could see air entrained in delivered water.

- ***Result:*** Wells #8, #9, #5, and the Key well appear to meet this criterion for SWL above the base of casing, though Well #5 only has 17 ft of ADD. It is assumed that the intake is set at or below the base of the casing in this location. If the current SC remains near 15 gpm/ft at Well #5, this 17 ft of DD would limit the pumping rate to approximately 250 gpm without dropping the PWL below the base of casing. Well #8 has 189 ft of ADD, Well #9 has 139 ft, and the Key well has 38 ft (**Table 2**). The remaining wells have a SWL that is below the casing, which is not preferred for AR/ASR use. Pumping tests are recommended to confirm current well performance and static/pumping water levels on the top three candidate wells.

Waste Discharge Options—To test and maintain water quality during ASR operations there are periods of time (i.e. pilot testing and backflushing) when water needs to be discharged to waste at a high rate. For maintaining well performance, discharge should be at rates higher than the injection rate to remove particulate. Even very low turbidity water can have enough particulate to cause minor clogging and temporary turbidity load when the pump is turned on. Particulates and oxides that accumulate in the aquifer near the well can be removed by periodic back flushing or a planned pump-to-waste period (typically 10 to 30 minutes) and/or on recovery startup. Even if a well is only used for injection, provision for periodic backflushing is needed to maintain performance.

- ***Result:*** Well #1 has no room for a detention/infiltration basin, but there is an industrial sewer that leads to a detention pond near an agricultural processing plant that could be used. Wells #3, #,6 and #9 also have access to the industrial sewer and Well #9 has a detention pond available about 200 yards south. Well #5 is located in a parking lot next to an industrial facility adjacent to the Little Walla Walla River. Well #5 may be able to discharge to the Little Walla Walla River with an NPDES permit, or surface infiltration on the vacant land north of the adjacent buildings could be a viable alternative. If discharge to the Little Walla Walla River is pursued, it may be necessary to install temporary settling/clarification tanks prior to direct discharge for testing phases. For this study, we have assumed that the Key well has the same waste discharge options as Well #5 as they are located approximately 600 ft apart. There is no disposal option currently at Well #8 in Marie Dorion Park. Direct discharge may not be a good option due to the presence of listed species in the Walla Walla River, and the City prefers to leave the park footprint unaltered. It is however possible to pump waste discharge to the top of the adjacent bluff (roughly 100 feet of

lift) where a detention facility could be constructed on City-owned land. Locations are prioritized with respect to discharge options as follows:

- Wells # 1, #3, #6, and #9 based on industrial sewer access.
- Well #5 and the Key Well
- Well #6
- Well #2

It is also important to consider the following:

Top of Basalt—A potential candidate AR/ASR well needs to have penetrated sufficiently deep into the basalt aquifer system to limit the potential for water to escape into the overlying alluvial aquifer during recharge. Based on our examination of other wells in the Walla Walla Basin, a well that is reported to have penetrated at least 75 ft into basalt has typically intersected at least one water bearing interval and will have limited connection to the overlying alluvial aquifer system.

Result: All wells have penetrated into at least 75 ft of basalt.

3.2.1 Known Well Issues

In addition to the criteria summarized above, the project team talked to City staff, and reviewed available records, to glean additional insights into known well issues that might affect AR/ASR operations. These issues include the following:

- The City's wells provide good water quality, but the City has experienced entrained air problems in several of its wells. Over the years, Wells #2, #3, #5, and #6 have had air problems that have been resolved using different techniques (Anderson Perry & Associates, 2010). Well #1 is the oldest City well and has had air entrainment issues in the past but issues have been resolved by discharging water into the reservoir and letting air off-gas. It is possible that this condition would be mitigated by AR/ASR if static and pumping water levels shifted up. While this has been successfully applied to some basalt wells in the region, it is not always successful.

- The Key was identified after the site visit, and conditions other than documented on the original well log are unknown.

- Well #6 is crooked and has had problems with equipment down the hole during repairs in recent years (Anderson Perry & Associates 2010). Problems such as this commonly inhibit, if not totally prevent, successful installation of necessary injection/recovery infrastructure.

- Well #9 is reported to be biofouled and it has not been used for municipal drinking water supply for several years. Prior to using this well for AR/ASR operations a well condition assessment and rehabilitation should be completed. If successful, rehabilitation has the

benefit of bringing a stranded water supply asset back online for the City. Well #8 is not generally used due to the relatively low pumping rate, lift, and efficiency, compared to the other City wells. This does not make it a poor candidate for ASR, though it would not provide the same storage volume as other locations and site development costs are likely to be high relative to others.

No other well issues were identified at this phase of the feasibility study.

3.2.2 Well Accessibility

Accessibility also is an important consideration when looking at the use of an existing well for AR/ASR operations. Because conversion of an existing well to AR/ASR operation usually requires in-well and well head modification, the site needs to be accessible enough to allow the modification work and accommodate new surface infrastructure. Based on that:

- Well #1 is next to the fire station in a residential area with a very small well house but with good access on three sides (**Appendix B**).
- Well #8 at the north end of Marie Dorion Park has no roof hatch but the City indicated the roof was designed to be removed for maintenance.
- Well #9 sits on top of the bluff overlooking the Walla Walla River. Well #9 is a pitless well located outside the well house but the infrastructure inside the well house is complex due to a system intertie. However, but it appears there is adequate room for recharge loop retrofit.
- Well #6 was not visited but it is far from the Little Walla Walla River (making source conveyance an expensive component of development) and not in the target pressure zone. If it is determined that Well #6 or another well is an appropriate alternative, it is recommended to obtain site photographs and potentially conduct another site visit.

3.2.3 Well Ranking Matrix

Each well was ranked most suitable for AR/ASR operations (ranked number [No.] 1) to worst (ranked No. 4 to No. 8 depending on duplicate values) for each category; SC, well age, casing diameter, ADD, waste discharge options, and known well issues. The lower the individual and total number, the more suitable the location is for an AR/ASR system. **Table 4** lists the results of the well-by-well ranking.

Table 4 Well Ranking Matrix

City Well ID	Specific Capacity	Well Age [1]	Casing Diameter [2]	Available Drawdown [3]	Waste Discharge Options [4]	Known Well Issues [5]	Total	Well Rank
Well #8	6	1	1	1	3	1	**13**	1
Key Well	1	3	1	2	3	4	**14**	2
Well #5	2	4	2	2 [6]	3	1	**14**	2
Well #2	3	3	1	4 [6]	3	1	**15**	3
Well #9	7	2	2	1	1	2	**15**	3
Well #1	5	4	2	4 [6]	1	1	**15**	3
Well #6	4	2	2	3 [6]	1	3	**17**	4
Well #3	8	3	1	4 [6]	1	1	**18**	5

Notes:
Ranking is based on 1 is most suitable for AR/ASR, 7 is least suitable. If there was not data available (N/A) then the parameter automatically received the highest number in that category. In the case of a tie, some wells had the same ranking.
[1]Age is grouped by decade starting with 1960 as the most recently drilled with the highest ranking of 1 (1960s) to 5 (1920s).
[2]Casing ranking is grouped by diameter; the largest diameter has the highest rank of 1 (16 inches), 2 (12 inches) and 3 (8 inches).
[3]Available drawdown (ADD) is ranked by; 1 = +100ft ADD, 2 = 0 to 100ft ADD, 3 = 0 to -50ft ADD, and 4 = >-50ft ADD.
[4]Waste Discharge Options are ranked; 1 = Assumed relatively easy to connect to industrial sewer, 2 = Assess to nearby detention or infiltration pond, 3 = Significant infrastructure required, and 4 = Unknown.
[5]Known Well Issues are ranked; 1 = No known issues preventing AR/ASR development, 2 = Condition that requires further assessment, and 3 = Known prohibitive condition.
[6]The static water level is below the bottom of casing.

Based on the well-by-well review; Wells #8, #5 and the Key well are initially interpreted to potentially be the most suitable for demonstration recharge testing based on available information. It appears that with likely good access, proximity to source, disposal options, specific capacity, and diameter, these wells could be converted for testing for the lowest potential cost. However, cumulative project implementation costs were not developed for each well, and if that were included as a ranking criteria, Well #8 would likely drop much lower on this list. The park does not appear to be a good candidate for river bank filtration (RBF), and therefore design, permitting, and construction costs of a new intake and fish screen, infrastructure to move water up and down the adjacent bluf would combine with the relatively low recharge and pumping rates to produce a low $/gallon stored ratio. At Well #5 the relatively low test well development cost would offset the potential risk of entrainment issues associated with limited available drawdown. However, these same potential issues exist with Well #5's current use as a supply well. Whether Well #5 or the Key well are also the best choice for long-term (permanent) AR/ASR operations depends on the City's final approach to source treatment (centralized vs. onsite) and access to adjacent property for construcation/installation of a permanent filtration

facility. An advantage of investigating the Key well is that it could be developed without interruption of service from Well #5.

Wells #2, #9, and #1 were ranked third. Wells #2 and #9 have distinct advantages, though access and discharge options at Well #2 are less understood. Well #9 has the advanage of reviving a stranded asset if the well is successfully reconditioned as part of an ASR testing program, and water stored at that location could be delivered to both the the City's pressure zones. These conclusions will be require further well investigation to confirm conditions, and will be paired with development costs at the end of Section 4, which will focus on the top three ranked wells. Addtional comments and thoughts bout these, and the other City wells, are listed in Table 5.

Table 5 Well Ranking Summary

City Well ID	Well Rank	Comments/Issues
Well #8	1	Good access and adjacent to source. Cost not yet factored into ranking. Intake from river level and then pumping waste to top of bluff likely to result in significantly higher development costs at this location. Water treatment plant could be located in parking lot for ASR testing, though would need to be constructed on city property on bluff above park for permanent facility.
Well #5	2	Good access and adjacent to source. Discharge: presence of onsite industrial sewer needs to be confirmed. ASR with PWL below base of casing would be necessary - risk of cascading water. Easement/access for permanent treatment system not evaluated.
Key well	2	Good access and adjacent to source. Discharge: presence of onsite industrial sewer needs to be confirmed. ASR with PWL below base of casing would be necessary - risk of cascading water. Easement/access for permanent treatment system not evaluated.
Well #2	3	Current well performance, casing depth, static and pumping water levels are unknown however the pump was pulled in 2017 and well videoed. This well may be a viable option though 1) additional information is needed and 2) the well is not close to an existing WW River reach or canal so conveyance of treated water would be a relatively high cost.
Well #9	3	AR/ASR at well #9 has several advantages: pressure zones are connected at this location, proximity to a reservoir, and a detention facility. Would require new intake, lift station, and raw water pipeline for onsite treatment.
Well #1	3	Old well, condition and seal assessment needed. SWL below casing. Would require new intake and raw water pipeline for onsite treatment.
Well #6	4	Limited discharge options and reported to be crooked borehole.
Well #3	5	Low specific capacity, limited discharge options, SWL below casing.

4. ENGINEERING PROJECT DEVELOPMENT PLAN

4.1 AR/ASR INFRASTRUCTURE NEEDS

4.1.1 General Requirements

To develop a successful and operational AR/ASR system, both for initial pilot testing/demonstration and permanent long-term operation, there a number of water system infrastructure requirements that must be addressed, including:

- ***Water Source for Recharge***—A source of available water during the low water demand and high streamflow season, generally November to April, to inject for storage in the AR/ASR wells. In most cases, this water is from a nearby surface water body (river or stream). If an existing surface water intake does not exist, then this infrastructure must be constructed to allow for legal diversion of the water from the surface water body.

- ***Water Treatment—***The water injected into the AR/ASR well must be treated to state and federal drinking water standards. For a surface water source, treatment will consist of a form of filtration and disinfection. When the project is ASR and drinking water is involved, the Oregon Health Authority will require that municipal treatment techniques are applied prior to injection. If the project is intended for aquifer recharge only, then there is more flexibility on treatment methods, though the criteria and objectives remain the same.

- ***Wellhead Modifications—***For demonstration testing, and often for full-scale AR/ASR implementation, the most cost-effective system uses existing groundwater wells for recharge and recovery. Modifications to the wellhead facilities are often required to facilitate and control recharge of water down the well, to support the monitoring and reporting requirements of the permit, and improvements to allow for frequent back-flushing of the well and discharge of water through a pump-to-waste system. If significant automation, variable flow mechanisms, or automated valving is installed, these upgrades can sometimes require electrical system improvements and/or wellhouse modifications.

- ***Recharge Water Conveyance—***Except in rare cases, the location of the surface water intake is not adjacent to the AR/ASR wellhead. In this case, either raw water conveyance from the intake to the treatment facility at the wellhead and/or finished water transmission piping from the treatment facility to the wellhead will be required.

4.1.2 Criteria for Concept Development

To define the configuration and magnitude of improvements to address the four components previously described, basic criteria and parameters for demonstration testing, and implementation of a multi-well AR/ASR system are defined in **Table 5**. Further discussion of

these criteria and required improvements for demonstration testing and demonstration and full-scale multi-well AR/ASR operation are discussed in greater detail in sections 4.2.1 and 4.2.2.

For this phase of the feasibility study, we have identified two phases of ASR development: demonstration testing and full-scale. Demonstration testing (sometimes called pilot testing) is conducted under a limited license and in many ways, represents the final phase of a feasibility study – proof of concept that water quality will not be impaired, and the recharge/recovery operations will not impair groundwater or surface water resources, other users, or senior water rights. Demonstration testing may occur with temporary controls and equipment to limit design and construction expenditure prior to final proof of concept. However, all other aspects of the system (source water, treatment approach, well location, rates, volumes, duration) may be identical to a permanent (referred to as "full scale" below) system. Conversely, the project development approaches may differ significantly: a demonstration test location would benefit significantly from proximity to source because treatment is likely to be at the wellhead and this would limit conveyance cost. For a permanent or full-scale system that relies on centralized treatment (a new WTP using the existing piping network to convey water to the AR/ASR wells) then proximity to the source is not a cost factor in assessing feasibility.

Table 6 Aquifer Storage and Recovery Concept Design Criteria

Parameter	Demonstration Testing	Full-Scale AR/ASR
Number of wells	1	1 or more wells
Recharge water supply rate[1]	< 2 mgd	Up to 5.5 mgd
Treatment Targets	Federal and State SDWA standards	Federal and State SDWA standards
Wellhead improvements	Flow metering – recharge and recovery	Flow metering – recharge and recovery
	PTW – Discharge pumping rate for 15 minutes	PTW – Discharge pumping rate for 15 minutes
	Recharge rate flow control (throttling capability)	Recharge rate flow control (automated valving and controls)

[1] Recharge water supply rate based on 75% of the current discharge rate of the largest well for demonstration testing and 75% of the City's future peak daily demand for full-scale AR/ASR operation.
Notes:
mgd = Million gallon(s) per day
PTW = Pump to waste
SDWA = Safe Drinking Water Act

4.1.3 Water Source for Recharge Supply

The Walla Walla River served as the historical source of drinking water for the City. However, all of the infrastructure associated with this supply source has been abandoned and/or removed. Because the City of Milton-Freewater's drinking water supply is from seven active groundwater wells located throughout the City recharge water supply from the Walla Walla River will require the construction of new water intake facilities. The City also holds municipal water rights for surface water supply from the Walla Walla River.

Potential Surface Water Intake Locations

Based on discussion with City and WWBWC staff, three locations for siting of surface water intake facilities are considered for this phase of the feasibility study:

1. ***Marie Dorion Park (site of the historical river intake and surface water treatment facility)—***A dam at this location provided grade control associated with the historical drinking water intake and hydroelectric power generation facilities at this location. The dam has since been removed limiting the opportunity for a traditional streambank or in-river diversion at this location. Based on the presence of a sand and gravel streambank below the flood protection wall at the Park, there appears to be good potential for RBF or streambed filtration at this location. However, historic land use at this location creates uncertainty with respect to subsurface conditions and further exploration is not recommended at this time. This potential intake location is located near Well #8 but is more than one mile from other City water system infrastructure. Because of land use restrictions at Marie Dorion Park, the water would need to be conveyed from the river to the top of the adjacent bluff for treatment (where permanent facilities could be constructed) then back downhill to recharge at well #8, or perhaps along the top of the bluff to Well #9.

2. ***At the Bonneville Power Administration funded Little Walla Walla River diversion immediately downstream of Cemetery Bridge—*** The 220 cfs intake is a modern diversion constructed with automated traveling fish screens and flow regulating and monitoring equipment. This diversion is located within a half mile of the City's Wells #1 and #2, and water can be either piped from this location to a City main or diverted to locations closer to supply wells through the Little Walla Walla River. Any new mainstem intake would focus on this location to manage very high design, permitting, and construction costs of a new intake.

3. ***City owned properties adjacent to the Little Walla Walla River—***Flow from the Walla Walla River is diverted into the Little Walla Walla River at the location described in Option 2. The Little Walla Walla River flows north through the City to near NE 8th Street where a control structure splits flow into three separate channels: East Little Walla Walla River, West Little Walla Walla River, and Hudson Bay Canal. This section of the Little Walla Walla River through the City is generally classified today as irrigation water conveyance channels. As such, it is anticipated that permitting a new intake should be streamlined relative to the Walla Walla River where the presence of fish species will influence approach. Further, the Little Walla Walla River runs adjacent to the Well #5 and the Key well site and is close to Wells #1, #2, and #3.

A summary of the pros/cons of each of these options is tabulated in **Table 6**.

Table 6 Comparison of Intake Location Options

Intake Location	Proximity to Existing Well for Demonstration Testing	Proximity to Existing Wells for Full AR/ASR	Ease of Intake Permitting	Ease of Water Right	Ease of Intake Design/ Operation
1	High[1]	Low	Low	High	Low
2	Medium	Medium[2]	High[3]	Medium	High
3	High	High	High	Low[4]	High

1 – An intake at this location feeding a WTP above Well #8 could conceivable serve both wells #8 and #9.
2 – This improves to "high" if the concept is centralized treatment near the intake, and treated water is distributed to wells through the existing conveyance piping.
3 – High because a permitted structure and fish screen already exists at this location. Access to the site and an easement for construction a pump station has not been evaluated.
4- Diversion of winter flows from the mainstem to the Little Walla Walla for the purpose of recharge has not been evaluated and requires additional examination.

As Table 6 illustrates, Option 2 and Option 3 best meet the criteria identified for comparison. Option 3 is well suited to a phased implementation of demonstration testing followed by a staged development of additional AR/ASR at other City wells using either similar near-well onsite treatment or a centralized treatment facility. For this study, Option 3 is the preferred option, particularly for demonstration testing, and will serve as the basis for developing a concept design and preliminary cost estimates for the intake, treatment, wellhead, and conveyance components. However, the ability of the irrigation district to operate the diversion in winter (and the acceptability of that action to other watershed stakeholders) needs further evaluation.

4.1.4 Surface Water Treatment for Recharge

There are four primary approaches available to the City for treating the Walla Walla River surface water for AR/ASR recharge. The City's 2009 Water System Master Plan (Anderson Perry, 2010) includes a detailed discussion of the four treatment technology approaches, including:

- Slow sand filtration.
- Conventional rapid sand filtration.
- Packaged treatment units.
- Membrane filtration.
- RBF/MAR (managed aquifer recharge)

The findings of that analysis relative to water for AR/ASR recharge are summarized below.

Slow sand filtration is a low cost and low technology option for the City but would require a large land area to implement. Typical slow sand filter loading rates are in the range of 100 gallons per day per square foot. For demonstration testing at up to 2 million gallons per day

(mgd), this would require 20,000 square ft of filter surface area. For permanent recharge operations, high turbidity levels in the treated water can be a concern as high turbidity levels can result in well clogging. Slow sand filtration is unlikely to be able to produce acceptable turbidity levels (less than 1 nephelometric turbidity unit [NTU]) through the recharge season when river turbidity levels are typically quite high (more than 100 NTUs). For these reasons, slow sand filtration is not further considered as a viable treatment technology for injection into wells for this project.

Custom designed and built conventional rapid sand filtration water plants have the advantage of being highly customizable with custom-designed unit treatment processes to address a broad range of water quality issues to produce high quality finished potable water. The disadvantages of this treatment method include high capital and operation and maintenance (O&M) costs, complex operation requiring highly qualified and certified experience operations staff, and development of systems for handling and disposal of treatment process residuals.

Packaged water treatment systems are available from multiple manufacturers. Like custom conventional rapid sand filtration, these package treatment systems typically include some form of sedimentation, coagulation, flocculation and filtration. The primary advantage of these systems over a custom conventional rapid sand filtration is that many packaged systems are designed to provide similar water quality in a smaller footprint with less operation complexity. This approach may be the most applicable for efficient setup of a demonstration test program at the first well location. Similar modular packaged treatment facilities could then be acquired and sited for each future AR/ASR well in a multi-well system. Selection of an appropriate packaged treatment system would require additional investigation to confirm the appropriate unit processes and filtration media to meet the water quality goals.

Membrane filtration systems have a relatively small footprint, less operational complexity and competitive capital and O&M costs relative to the other treatment technologies presented. Similar to a packaged treatment system, membrane filtration systems are somewhat modular allowing for multiple installations at strategic sites in close proximity to an intake or well. In order to achieve acceptable water quality for effective membrane operation, it is likely that a pre-treatment system will be required. An automatic filter/screen system installed upstream of the membrane filters would likely be adequate to reduce the turbidity and concentration of suspended solids in the raw water to acceptable levels to avoid membrane fouling.
Both membrane filtration and a packaged treatment system present the greatest opportunity for implementation to support demonstration testing and flexibility in adaptation to a full-scale multi-well AR/ASR system. For the purpose of this study, membrane filtration is the preferred option and will serve as the basis for developing a concept design and preliminary cost estimates for the intake, treatment, wellhead, and conveyance components. Further investigation and treatment system pilot testing will be required before full-scale implementation for production of water for AR/ASR recharge.

RBF/MAR both have the potential to either treat raw surface water sufficiently to be used for direct recharge to the basalt aquifer, or to pre-treat the water (through reduction in turbidity) sufficiently to lower primary treatment costs. One of the key advantages to both methods is that

they eliminate the need to comply with OHA treatment technique requirements that are in effect when water is removed from a surface water supply and piped directly to a well. If a land application or induced infiltration step is inserted between the raw surface water source and the pipeline to the well, then achieving measurable water quality criteria drives the treatment process rather than managing long term risk to human health from possible contaminants. The physical conditions needed to support RBF at Marie Dorion Park appear to exist, though further exploration is not recommended due to historic land use nearby.

MAR using the well-known shallow alluvial aquifer system has potential to be a key component in the City's ASR treatment approach. One concept is to land apply raw surface water for infiltration, then recover the infiltrate with an alluvial well or wells after it has been filtered/polished in the subsurface. Because the shallow alluvial aquifer has the potential to have been impacted by surface contamination, a pumping well has the potential to produce impacted groundwater if not carefully sited and operated. One concept for consideration would be to surround the alluvial recovery well with infiltration basins or trenches, and then pump the well at rates designed to manage gradients to prevent capture of potentially impacted groundwater. If sufficient land and subsurface conditions are available, an MAR/Recovery treatment system has the potential to supply winter water to more than one deep ASR well. This option would require significant surface area of suitable land near the ASR well to limit conveyance costs. In addition, site characterization is necessary prior to design to assess subsurface conditions. Consequently, this option will not be carried forward unless the City identifies a parcel suitable for acquisition and exploration.

4.1.5 Wellhead Improvements

To begin AR/ASR operations at an existing municipal groundwater supply well, there are a number of important improvements that must be made to manage recharge and to meet the monitoring/reporting requirements of an AR/ASR Limited License. A brief description of these items is presented below:

- ***Bi-directional flow metering***—Each AR/ASR wellhead must include flow monitoring to accurately measure the rate and volume of water for both recharge and recovery. Recharge and recovery are typically transmitted through a common main at the wellhead, so a bi-directional flow meter is needed to measure these flows. A bi-directional flow meter is typically installed for this purpose. Existing flow meters at the wellhead or located adjacent in a vault would be replaced to achieve this requirement.

- ***Dedicated pump-to-waste piping***—Most of the City's existing wells are configured with deep well pump control valves that pump-to-waste at pump startup, primarily to managing hydraulic transients (surge events). In addition to this pump and distribution system protection, the ability to periodically operate the pump during the recharge and storage to cycles for backflushing of the aquifer is a critical function for AR/ASR. To achieve this, dedicated automated valving to allow for pump-to-waste operations is needed. This is generally achieved through the addition of a second globe style control valve and branch line that discharges to atmosphere separate from the pump control valve

which closes shortly after pump startup. Installation of a dedicated pump-to-waste tee and control valve can be accommodated at each of the wells. Reconfiguration of the wellhead discharge header will be required for most wells for this purpose and for installation of recharge flow control valving.

- ***Pump-to-waste discharge***—The volume of water generated during a backflushing event is far greater than the water discharged during a normal pump startup. Onsite detention facilities, or discharge to a storm or sewer conveyance system with adequate capacity is needed. Based on the capacity of the City's wells, a rate of up to 2 mgd for a duration of 15 minutes is a good planning target. Several of the City's wells are in close proximity to an existing industrial sewer collection system that runs through the City. It is assumed that conveyance of pump-to-waste water to this system can be accomplished at most of the City wells and that onsite detention will not be required except at wells #8 and #9.

- ***Recharge Flow Control***—Valving to achieve a constant recharge rate into the well is required. This is typically achieved through the installation of a hydraulically operated globe style flow control valve located on the recharge loop that bypasses the pump control valve. As with the pump-to-waste system, this improvement will require reconfiguration of the wellhead discharge piping but with the possible exception of well #1, there appears to be adequate space within the well houses visited to accommodate this.

Based on our site visit to several of the City wells, it appears that major modification of the well discharge piping will be required to accomplish all of the improvements described above, but these modifications have been completed successfully at other projects with wells of a similar age and there are no apparent fatal flaws to accomplishing these improvements within the confines of the site and well house at each of the City's wells.

4.1.6 Recharge Water Conveyance

Based on the AR/ASR demonstration and full-scale expansion concepts described in this section (near-well diversion and wellhead treatment) limited conveyance of raw or finished water is anticipated. For flows up to 2 mgd, a 12-in. diameter main between the intake and treatment facilities, and between the treatment facilities and wellhead is recommended. Based on the specific flow rates anticipated, this pipe size recommendation should be refined during final design as there may be opportunity to reduce the diameter to an 8-in. diameter main.

4.2 DEVELOPMENT PROCESS

A discussion of the major steps required to develop the infrastructure needed to implement an AR/ASR program at the demonstration testing phase and for full-scale development is presented below. A demonstration project is assumed at Well #5, and full-scale development is assumed to expand the system to five wells. This section also presents a duration for each component of implementation and planning level project cost estimates for demonstration testing.

4.2.1 Pilot Testing

Based on the analysis presented above, from the perspective of infrastructure needs to support AR/ASR demonstration testing, Well #5 is the most viable. The proximity to the Little Walla Walla River and adequate space onsite for siting treatment facilities are major factors. A timeline for completing the improvements required to start demonstration testing at Well #5 include:

- ***Recharge Water Intake Siting and Permitting (5 months).*** At Well #5 and the Key well, siting and permitting of a new surface water intake is expected to be very straightforward assuming that each of the regulatory agencies involved in the review and approval of a surface water intake concur that this stretch of the Little Walla Walla River is in fact irrigation conveyance channel. If this is not the case, a duration of 12 months or longer should be expected, with significant restrictions placed on the configuration and operation of the intake. A simple intake design is anticipated for this site, consisting of a skid-mount pump and removable above ground suction pipe to the canal. A coarse fish screen would be on the pump suction pipe in the Little Walla Walla River. The piping and screen could be removed during periods when recharge is halted.

- ***Water Treatment Technology Selection (4 months).*** Selection of the appropriate water treatment technology should be confirmed through a scaled demonstration testing program. Pilot testing should be conducted with the selected treatment technology for at least 2 months during the period with the greatest degradation of raw water quality. This will typically be in the spring season when Walla Walla River flows are high due to spring rain events. This task could be completed concurrently with the recharge water intake permitting. A membrane treatment configuration would consist of a package membrane treatment system, skid mounted, and installed in a treatment building. In addition, pre-treatment would consist of automatic filter screens to reduce turbidity and remove coarse sediment to protect the filters.

- ***Improvement Design*** (***4 months).*** Once the previous two tasks are complete, design of the intake, treatment system, and wellhead improvements can commence.

- ***Construction (9–12 months).*** Construction of the designed improvements is anticipated to take approximately 9 to 12 months depending on lead-times for treatment equipment, seasonal regulatory restrictions on in-water work, and seasonal City constraints to taking the well out-of-service.

- ***Total Duration to prepare for Demonstration Testing (18–25 months).***
  While it may be possible to implement a less-robust pilot system in a shorter duration, the proposed implementation program presented herein provides the City with the best opportunity for seamless operation and minimal operational hurdles. In addition, if demonstration testing proves that AR/ASR can effectively be implemented on a full-

scale, this demonstration operation will serve as the foundation of the full-scale AR/ASR system without the need for further improvements.

Permitting tasks are not included in this timeline. Early phases of AR/ASR permitting generally occur prior to beginning design and construction, while the remainder occur as the demonstration project evolves and additional information is developed. The initial phases of permitting to acquire regulatory concurrence on the project framework would add roughly 6-months to the total duration of the and would generally add 6 months to the project duration, and the first phase of demonstration testing another 6 to 12 months.

4.3 MULTI-WELL AQUIFER STORAGE AND RECOVERY SYSTEM

The timeline presented above reflects the typical timeline for engineering design and construction implementation of AR/ASR at additional wells in the City system. It should be anticipated that a phased implementation of AR/ASR expansion could be achieved through the development of one additional well every 2 years. This assumes separate intakes on the Little Walla Walla River and development of satellite treatment facilities. There may be opportunity to develop a single intake and treatment facility to serve two nearby wells, such as Well #1 and Well #2, reducing overall development cost and duration.

4.4 DEMONSTRATION TESTING PROGRAM DEVELOPMENT – PLANNING LEVEL PROJECT COST ESTIMATE

An estimated project cost has been developed based on the project design parameters. Cost estimates represent opinions of cost only, acknowledging that final costs of the project will vary depending on actual labor and material costs; market conditions for construction; regulatory factors; final project scope; project schedule; and other factors. The Association for the Advancement of Cost Engineering International classifies cost estimates depending on project definition, end usage and other factors. The cost estimates presented here are considered Class 5 with an end use being concept screening and an expected accuracy range of -40 percent to +80 percent. As the project is better defined, the accuracy level of the estimates can be narrowed.

Table 7 presents a planning level project cost estimate for development of the infrastructure to support an AR/ASR demonstration testing program at the City's Well #5, assuming a 2 MGD recharge rate, which may be suitable to supply two ASR wells. Table 8 presents a planning level project cost estimate for the same system at a 1 MGD recharge rate. It is assumed that the Key well and Well #5 have similar development costs, though a physical inspection of the Key well is needed to confirm condition and infrastructure needs.

Table 7 Planning Level Project Cost Estimate
Well #5/Key Well AR/ASR Demonstration Testing Improvements at 2MGD Recharge Capacity

Item	Estimated Cost
Recharge Water Intake	$ 150,000
Water Treatment	$3,900,000
Wellhead Improvements	$180,000
Subtotal - Construction	***$4,230,000***
Engineering (20%)	$850,000
Non-ASR Permitting and Administration (5%)	$200,000
Contingency (20%)	$850,000
ASR Permitting and Aquifer Testing	$275,000
Total	***$6,405,000***

Table 8 Planning Level Project Cost Estimate
Well #5/Key Well AR/ASR Demonstration Testing Improvements at 1 MGD Recharge Capacity

Item	Estimated Cost
Recharge Water Intake	$ 150,000
Water Treatment	$2,100,000
Wellhead Improvements	$150,000
Subtotal - Construction	***$2,400,000***
Engineering (20%)	$480,000
Non-ASR Permitting and Administration (5%)	$120,000
Contingency (20%)	$480,000
ASR Permitting and Aquifer Testing	$275,000
Total	***$3,755,000***

An alternative to both treatment and disposal for both the Key and #5 well locations would be to utilize vacant land north of the adjacent warehouse. The concept would be to pump water from the little Walla Walla River (either directly or through river-adjacent induced infiltration), and polish that water through infiltration into the shallow alluvial aquifer. That water could then be captured by a new alluvial well or wells and then delivered directly to the Key well or Well #5, perhaps without additional treatment. The same infiltration basin could be used to manage waste discharge and recycle the produced water once turbidity is removed and could be sized to supply multiple ASR wells. If this treatment/discharge management option is pursued, the following elements would need to be further defined:

1. Land availability and acquisition costs.

2. An environmental assessment of this site and characterization of soil and shallow groundwater conditions.

3. A monitoring system

4. Design and construction costs for the intake or infiltration system, infiltration basin, alluvial recovery system, and conveyance to/from the Key and Well #5 locations.

To be consistent with planning-level cost estimating for other treatment alternatives, this concept is preliminarily developed in Table 9.

Table 9 Planning Level Project Cost Estimate
Well #5/Key Well AR/ASR Demonstration Testing Improvements
MAR System (1 mgd capacity)

Item	Estimated Cost
Recharge Water Intake	$ 150,000
Basin Construction	$100,000
Alluvial Capture Well (well, wellhouse, pumping, mechanical and electrical systems)	$750,000
Conveyance Piping	$150,000
Disinfection	$50,000
Wellhead Improvements	$150,000
Subtotal - Construction	***$1,350,000***
Land Acquisition	$1,000,000
Site Characterization (soil sampling, 3 monitoring wells, GW sampling, write-up)	$75,000
Non-ASR Permitting and Administration (5%)	$70,000
Engineering (20%)	$270,000
Contingency (20%)	$270,000
ASR Permitting and Aquifer Testing	$275,000
Total	***$3,310,000***

5. CONCLUSION

Based on the physical ranking and known existing conditions, Well #5 and the Key well are the most viable AR/ASR wells but there are trade-offs associated with each. Well #5 has limited ADD (17 ft) and the Key well has a limited ADD (38 ft) but are adjacent to the Little Walla Walla River and are downstream of the diversion point. Therefore, one of these two wells are likely to be the best location for demonstration testing.

6. RECOMMEDATIONS

Recommendations at this phase of the project involve developing a scope of work (for the next phase of the feasibility study) to address the primary uncertainties surrounding demonstration project development at Well #5/Key well. These include:

1. Well Condition Assessment, including:
    a. Specific Capacity Test (last measured 1936)
    b. Aquifer test to assess reservoir size, response, and recharge area of influence
    c. Video survey to observe casing condition, well depth, evidence of seal, storage intervals (if evident), assess risk of cascading water, assess stability of pump intake location, and biological activity.
2. Confirm presence, distance, and hydraulic carrying capacity of industrial sewer for waste discharge connection. Confirm feasibility of discharge to sanitary sewer for demonstration testing, and develop a detailed cost estimate for well improvements and connections.
3. Confirm feasibility of adding a point of diversion to the City's surface water right adjacent to Well #5, and diverting a portion of the mainstem flow into the Little Walla Walla River.
4. Consult with agencies to evaluate the viability of a direct intake adjacent to Well #5 in the Little Walla Walla River.
5. Confirm that the City wishes to develop an ASR project vs. an AR project. If ASR, consult with OWRD and OHA to ensure that the preferred treatment method for demonstration testing will satisfy OHA's treatment technique requirements, then develop a detailed design and construction cost estimate for source appropriation and conveyance.
6. Finalize design elements (power regeneration, recharge flow control, automation, power, logic controller(s), etc. to finalize construction cost estimates.
7. Develop an ASR permitting flow-path, timeline, and cost estimate specific to the Well #5 project.

7. NEXT STEPS

For this phase of the feasibility study, the next steps are limited to the completion of Tasks 3 and 4. These are summarized as:

TASK 3 – Investigate Water Treatment Alternatives: Work under this task will involve developing a final water treatment alternative recommendation for meeting the requirements of ORS-690-350 based on characterization of source water chemistry.

- Collect samples of raw Walla Walla River source water and basalt groundwater.
- Analyze for geochemical compatibility through comparison to other projects, and to support an engineering assessment of water treatment requirements.
- Three Surface water samples will be collected in winter months to characterize the water likely available for treatment and storage. One groundwater sample will be collected at Well #5.
- EA will coordinate the timing with WWBWC staff to collect three surface water samples at hydrograph positions most likely to be associated with water availability. A staff geologist will coordinate with the laboratory, place a bottle order, provide monitoring equipment, prepare containers, and travel to Milton-Freewater to collect samples with staff support.

TASK 4 – Conduct Analysis of Instream Flows and Alternatives: Work with WWBWC staff to prepare an analysis of by-pass, optimum peak, flushing and other ecological flows of the Walla Walla River and the effect of diversion for groundwater storage on those flows.

Final conclusions and recommendations for next steps will be included with the Task 3 and 4 Report to be completed mid-2018.

8. REFERENCES

Anderson Perry & Associates. 2010. *City of Milton-Freewater, Oregon Water Management and Conservation Plan Update.* October.

Anderson Perry & Associates. 2011. *City of Milton-Freewater, Oregon Water Management and Conservation Plan Update Addendum.* May.

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Figures

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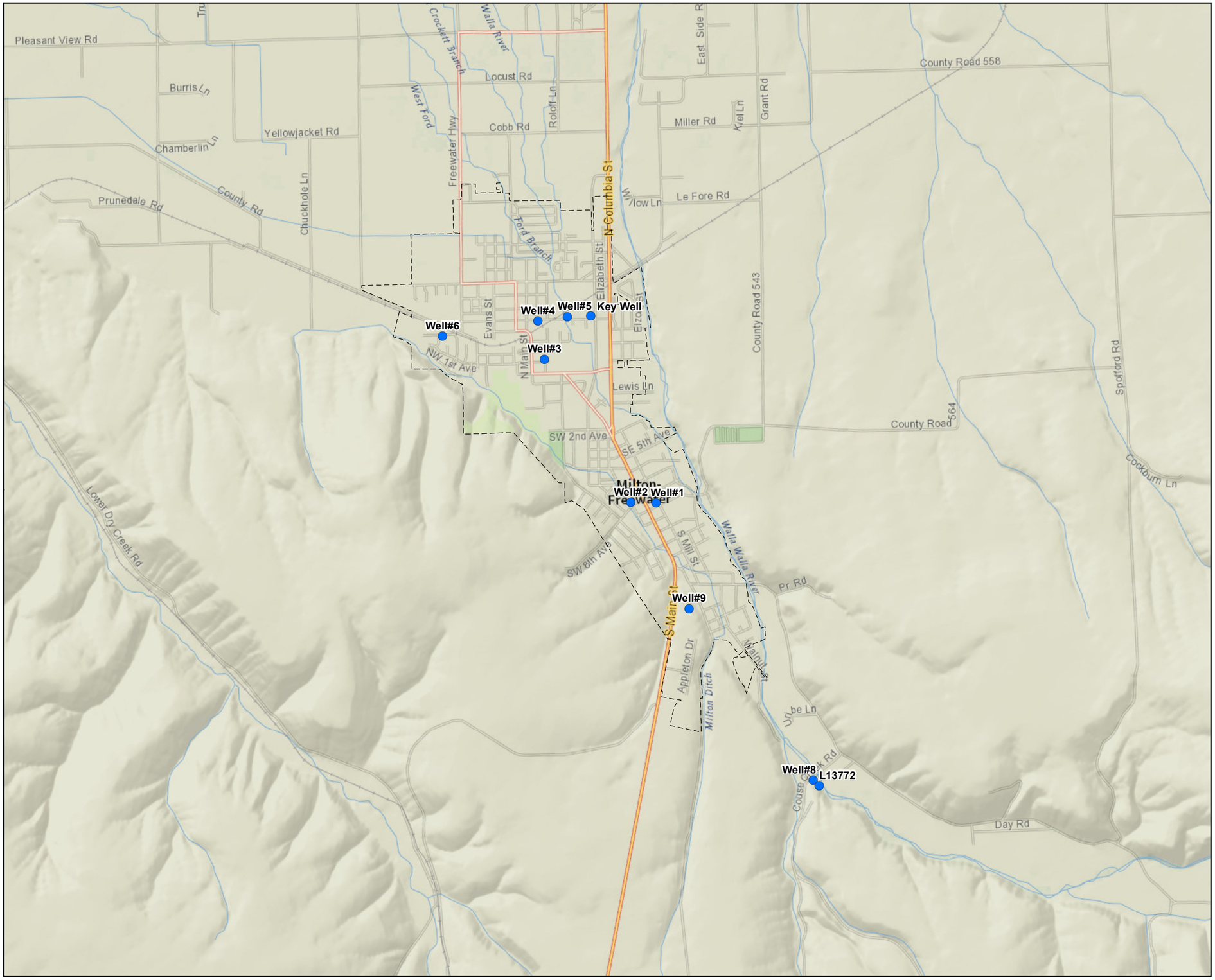

LEGEND

- Milton-Freewater Wells
- City Limits 2016

0 0.35 0.7 1.4

Miles

Milton Freewater WWBWC ASR Feasibility Study Phase 1

Figure 1. Well Locations

Appendix A

Water Rights

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Permit A-1—400—2-37

Well No. 1

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That MILTON CITY, A MUNICIPAL CORPORATION of Milton, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of a well a tributary of Walla Walla River for the purpose of domestic, industrial, commercial and municipal use, under Permit No. U-102 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from January 18, 1937;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1.5 c.f.s. measured at the point of diversion from the well or source of appropriation,

or its equivalent in case of rotation.

The point of diversion is located in the SE¼NW¼, Section 12, Township 5 North, Range 35 East, in Block 7 McCoy's Addition of Milton,

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

S½ of SW¼ and a fraction of SW¼ SE¼
Section 1
NE¼ SW¼ and SE¼
Section 2
All of Section 12 except NE¼ NE¼
E½ NE¼ of Section 13,
Township 5 North, Range 35 East, W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

After the expiration of fifty years from the date of this certificate or on the expiration of any federal power license issued in connection with this right, and after not less than two years' notice in writing to the holder hereof, the State of Oregon, or any municipality thereof, shall have the right to take over the dams, plants and other structures and all appurtenances thereto which have been constructed for the purpose of devoting to beneficial use the water rights specified herein, upon condition that before taking possession the State or municipality shall pay not to exceed the fair value of the property so taken, plus such reasonable damages, if any, to valuable, serviceable and dependable property of the holder of this certificate, not taken over, as may be caused by the severance therefrom of the property taken in accordance with the provisions of section 47-508, Oregon Code 1930.

WITNESS the signature of the State Engineer, affixed this 31st day of January, 1939

CHAS. E. STRICKLIN
State Engineer

Recorded in State Record of Water Right Certificates, Volume 11, page 12070

5N/35-12 Fill
UMATILLA

IVED
1 1938
STATE ENGINEER
SALEM, OREGON

(3961) UMAT 3961 OBSERVATION WELL

Milton Freewater * 1

Application No. U 109
Permit No. U 102
Well No. #1

G 5389

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report _____, 193__

#. 40' of Lot 5, Block 7, McCoy's Addition to Milton City, Oregon.

1. Location of well: S. W. ¼ of Section 12 Twp. 5 N Rge. 35 E. W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1000 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: 9.5 feet.
5. Date of beginning drilling or digging January 2, 1937
6. Date well was completed March 1, 1938

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
	At surface	ft.
	ft.	ft.
(SEE SHEET ATTACHED)	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.

Remarks: _____

WELL INFORMATION

8. Diameter of well 12" inches. Depth of well 652 feet.
9. Depth at which water was first encountered 90' feet.
10. Water level when completed: 87' feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: See log attached.
This well for "standby" service only.

UMAT 3961

F 11)
SN/35-12 ~~111~~)
UMATILLA

PUMP INFORMATION

12. Manufacturer of pump: Fairbanks-Morse & Company
13. Address: 1220 First Avenue South, Seattle, Washington
14. Data on name or base plate: #32523 - Seattle No.7310
6 Stage 12" Imp. 7472, Figure 6920, 1750 R.P.M.
Outside column 9" O. D., Length 150', Shaft 1 5/8" Dia.
15. Data on pump bowl assembly:
16. Size of pump: 12"
17. Rated capacity: 1000 gallons per minute. 80 pounds pressure
18. Rated speed: 1800 revolutions per minute. water to water hd.
19. Number of stages: 6
20. Size of intake pipe: 9"
21. Size of discharge pipe: 12"
22. Length of intake pipe: 150'
23. Length of discharge pipe: Direct into 12" city main
24. Suction lift: (difference in elevation between water surface in well and pump)
25. Discharge lift: (difference in elevation between pump and end of discharge line)
26. Depth of pump intake below ground surface: 187' feet.
27. Remarks: 187' to bottom of intake pipe

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: Fairbanks-Morse & Co.
29. Address: 1220 First Avenue South, Seattle, Washington
30. Type of motor or engine: 100 H.P., Morse Type, 1750 R.P.M., 3 phase, 60 cy., 440 volts, vertical ball bearing, hollow shaft squirrel cage.
31. Data on name or base plate:
32. Rated horsepower: 100
33. Rated speed of motor or engine: 1750 revolutions per minute.

34. Rated Capacity of Pump (with described motor)

1000	g.p.m. at	305	ft. head
1200	g.p.m. at	250	ft. head
1250	g.p.m. at	240	ft. head
	g.p.m. at		ft. head
	g.p.m. at		ft. head

35. Remarks:

UMAT 3961

F(1)
5N/35-12 #1
UMATILLA CO

CAPACITY TEST

36. Date of test: April 22 37. Temperature of water 58°F. or ____°C.
38. Motor speed during test: ____
39. Test made by (weir, tank or other means): Orifice

40.

Pounds pressure	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	▫ Draw-down	+Time
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
___lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.

(See report of Fa banks-.se Engineer attached)

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
▫ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 305 ft.
42. Water is discharged into: 12" city water main
43. Was water lowered to pump intake by test? ____
44. Remarks: ____

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand
Address: Walla Walla, Washington
46. Pump and motor were installed by: Carleton M. Mull, Fairbanks-Morse Co.
Address: Yakima, Washington
47. Capacity test was made by: Carlton M. Mull
Address: Yakima, Washington
48. General remarks: Checked by Mr. White, Engineer, Oregon Insurance Rating Bureau, Portland, Oregon

Report made by Milton City
(sign here)
Gershwilert
Bus. Mgr.

UMAT 3961

U-102

F(1)

5N/35-12

UMATILLA CO

LOG OF MILTON WELL - UMATILLA COUNTY

From 1 to 30 ft. gravel
30 to 37 " Cement & Gravel
37 to 46 " Gravel & Clay
46 to 60 " Black Rock
60 to 98 " Rock & Clay
98 to 115 " Black Rock
115 to 122 " Hard Black Rock
122 to 140 " Medium Rock
140 to 145 " " " Soft Red Brown
145 to 180 " " " Black
180 to 186 " Hard Black Rock
186 to 202 " Medium Grey Rock
202 to 212 " Soft " "
212 to 249 " Medium Brown Rock
249 to 256 " Hard Brown "
256 to 280 " Soft Brown Rock
280 to 367 " Medium Grey Rock
367 to 416 " " Black Rock
416 to 440 " " Grey "
440 to 450 " " Black "
450 to 651 " " Grey "

JN/35-12 FIII
UMATILLA

UMAT 3961

MILTON CITY, OREGON APRIL 22, 1938

Test made Fairbanks, Morse Turbine Pump

Pump #32523, Seattle No. 7316

6 Stage 12" Imp. -747-E Fig 6920 - 1750 R.P.M.

Outside column 9" O.D. Length 150 ft. shaft 1-5/8" Dia.

Capacity 1000 G.P.M. at Water to Water head 300 Ft.

Motor Fairbanks, Morse 100 H.P. Type HSZU - 1800 R.P.M.

Motor No.324047 - Fr.JL163B - 3 ph. 60 cycle 440 Volt.

118 Amps. F.Load Speed 1755 R.P.M.

Test Data:-Pump Started at 2:55 P.M.; Stopped at 5:30 P.M.

Length of air line below pump floor level 177' + 5'7" =182'7"

Draw down gauge before pumping = 37 lbs. = 85.5 ft.

Pumping at no pressure on discharge.

Draw gauge 10# = 23.1 Ft.

Pumping level 140 Ft.

Capacity thru 9.5" orifice in 12" O.D. Pipe 10" = 1400 G.P.M.

K. W. demand at power 1 mile distance 90 K.W. X 1.34 = 1201 H.P.

Discharge pressure 30# = 69.3 Ft.

Draw down gauge reading 14# = 32.25 Ft.

Capacity thru 9.5" orifice 8" = 1200 G.P.M.

Discharge pressure 50# = 115.5 Ft.

Draw down gauge 16 lbs = 36.98 Ft.

Discharge thru 9.5" orifice 7" = 1150 G. P. M.

Motor Speed 1762 - 1775 - 1760 R.P.M.

Motor In Put 127 Amps - 121 - 125 - P.Factor 90%

Discharge pressure 80 lbs. = 184.8 Ft.

Draw down gauge = 21 lbs. = 48.5 Ft.

Discharge thru 9.5" orifice 5-1/4" = 1000 G.P.M.

Motor Speed 1752 - 1754 - 1760 R. P. M.

Motor In Put 125 Amps - 124 - 122. P. Factor 88%

UMAT 3961

5N/35-12 F(1)

Umatilla

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Hill-Freewater Description of source #1

Analysis by MP Date 11/19/53 Collected by _____ Date 6/25/53

RESULTS

	Parts per million
Turbidity	5
Color: Apparent _____ True	3
Odor: Hot _____ Cold	
Total Solids	150
Loss on Ignition	[illegible]
Silicon (SiO_2)	19
Chloride (Cl)	4.8
Sulfate (SO_4)	3.4
Calcium (Ca)	34
Magnesium (Mg)	2.3
Aluminum (Al)	0
Orthophosphates (PO_4)	.10
Metaphosphates ($PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	2
Bicarbonate	78
Hardness (as $CaCO_3$)	94
Sodium and Potassium (as Na)	35
Iron (Fe)	0
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	2.5

pH 7.9

Remarks _____

PHE-10

UMAT 3961

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-12F(1)

County UMATILLA

Application No. .....

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. # 1

Description of measuring point: .....

Date	Water Level Feet (above) (below) Land Surface	Remarks DATE	WATER LEVEL	Date	Water Level Feet (above) (below) Land Surface	Remarks DATE	WATER LEVEL
5-28-37	85.5	6- 55	145	4-57	140	10-59	193
7-45	107	8	149	8	160	11	164
5-52	136	9	140	9	165	12	165
3-15-54	137	10	139	10	160	1-60	168
3-30	136	11	142	11	156	2	174
4	138	12	140	12	158	3	186
5	135	2-56	140	1-58	155	4	165
6	145	3	138	3	155	5	170
7	147	4	145	4	153	6	175
9	136	5	142	5	155	7	183
10	132	7	151	8	165	8	180
11	135	8	154	10	150	9	176
12	132	9	155	11	157	10	174
1-55	135	10	150	12	150	11	173
2	132	11	148	3-59	145	1-61	169
3	134	12	145	4	150	2	182
4	130	1-57	148	8	164	4	195
5	134	2	147	9	173	5	190

REMARKS: .....

State Printing 88814

UMAT 3961

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-12F(1)

County UMATILLA

Application No. .....

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. #1

Description of measuring point: .....

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
6 - 61	182		4-20-64	181	
7	180		5-18	183	
11	170		6-15	196	
12	172		7-13	205	
11 - 62	190		8-24	204	
12	188		9-21	205	
1 - 63	200		10-26	202	
2	200		12-28	193	
3	200				
4	204				
5	195				
6	207				
10-28	200				
11-20	193				
12-2	194				
1-13-64	188				
2-24	185				
3-17	210				

REMARKS: .....

State Printing 88314

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED MAY 10 1971 STATE ENGINEER SALEM, OREGON

UMAT 3960

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3960 State Well No. 5N/35-12 dda

State Permit No. U-109

(1) OWNER:
Name CITY OF MILTON - FREEWATER ORE.
Address M-F ORE.

(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 ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☒ Welded ☐ ?
12" Diam. from 0 ft. to 84 ft. Gage ?
PREVIOUSLY INSTALLED
Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? ☐ Yes ☐ No.
Type of perforator used SEE hoG
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
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
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 202 ft. below land surface Date 3-15-71
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? CONTRACTOR
Yield: 1484 gal./min. with 182 ft. drawdown after 24 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 62° Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used CEMENT
Depth of seal 84 ft.
Diameter of well bore to bottom of seal 12 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☒ Yes ☐ No
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.

(11) LOCATION OF WELL:
County UMATILLA Driller's well number
SE ¼ NE ¼ Section 12 T. 5N R. 35 E W.M.
Bearing and distance from section or subdivision corner Beginning @ the center of section 12, N. 850' Thence W. 250' to well #1

(12) WELL LOG:
Diameter of well below casing 12"
Depth drilled 656 ft. Depth of completed well 656 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.

MATERIAL	From	To	SWL
WELL WAS ORIGINALLY DRILLED IN 1905, REPORTED TO HAVE BEEN 651' ACTUAL DEPTH WAS 636' CASING HAD BEEN PERFORATED WE PRESSURE GROUTED THROUGH PERFORATIONS SHUT OFF SURFACE WATER ENTERING PERFORATIONS, MADE TEST, NO LOSS OF WATER WITH HOLE FILLED TO TOP UNDER 50PSI AFTER CEMENTING			
GREY BASALT	636	642	202
BLACK BASALT	642	656	202

Work started 1-21 19 71 Completed 3-17 19 71
Date well drilling machine moved off of well 3-16 19 71

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] (Drilling Machine Operator) Date 3-31, 19 71
Drilling Machine Operator's License No. 361

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 CHARLES JUNGMANN DRILLING CO. (Person, firm or corporation) (Type or print)
Address 105 REES AVE. W. W. WASH.
[Signed] (Water Well Contractor)
Contractor's License No. 336 Date 3-31, 19 71

(USE ADDITIONAL SHEETS IF NECESSARY)

RECEIVED
JAN 4 1970
STATE ENGINEER
SALEM, OREGON

Permit No. G-4924

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Milton-Freewater
(Name of applicant)

of P. O. Box 108, Milton-Freewater, Oregon, county of Umatilla,
(Postoffice Address)

state of Oregon, do hereby make application for a permit to appropriate the following described ground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:

If the applicant is a corporation, give date and place of incorporation

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Walla Walla River
(Name of stream)
tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 2.0 cubic feet per second or 900 gallons per minute.

3. The use to which the water is to be applied is domestic, industrial, commercial and municipal use.

4. The well or other source is located 850 ft. N (N. or S.) and 250 ft. W (E. or W.) from the S.E. corner of S.E. ¼ of the N.W. ¼ of Section 12 T. 5 N. R. 35 E.W.M.
(Section or subdivision)
The S.E. corner of the S.E. ¼ of the N.W. ¼ of Section 12 T.5N R. 35 E.W.M. is also the center of said Sec. 12
(If preferable, give distance and bearing to section corner)
(If there is more than one well, each must be described. Use separate sheet if necessary)
being within the S.E. ¼ N.W. ¼ of Sec. 12, Twp. 5 N, R. 35 E., W. M., in the county of Umatilla.

5. The (We intend to use existing pipeline to xxxx existing well) miles
(Canal or pipe line)
in length, terminating in the S.E. ¼ N.W. ¼ of Sec. 12, Twp. 5 N., R. 35 E., W. M., the proposed location being shown throughout on the accompanying map.
(Smallest legal subdivision)

6. The name of the well or other works is City of Milton-Freewater Well No. 1 old permit No. U-102

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of redeveloping one (1) well having a
(Give number of wells, tunnels, etc.)
diameter of 12 inches and an estimated depth of 800 feet. It is estimated that 0 feet feet of the well will require (Kind) casing. Depth to water table is estimated 112 (Feet)
100' of 12" steel casing in already installed in well, perforations are recorded in the casing at 50'. Perforations will be sealed by pressure grouting.

G1—4M

SP*7201

CANAL SYSTEM OR PIPE LINE—

G 4924

9. (a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(b) At ..... miles from headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(c) Length of pipe, ... ft.; size at intake ..... in.; in size at ..... ft. from intake ..... in.; size at place of use ..... in.; difference in elevation between intake and place of use, ... ft. Is grade uniform? ..... Estimated capacity, ... sec. ft.

10. If pumps are to be used, give size and type 1500 G.P.M. turbine

Give horsepower and type of motor or engine to be used 200 H.P. electric

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

Walla Walla River is 1000' to East. River channel is approximately 9' lower than well site.

12. Location of area to be irrigated, or place of use .....

Township N. or S.	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 North	Range 35 E.	Sec. 12		Municipal
5 North	Range 35 E.	Sec. 1		Municipal
5 North	Range 35 E.	Sec. 11		Municipal
5 North	Range 35 E.	Sec. 2		Municipal
5 North	Range 35 E.	Sec. 13		Municipal
5 North	Range 36 E.	Sec. 18		Municipal
6 North	Range 35 E.	Sec. 35		Municipal

(If more space required, attach separate sheet)

Character of soil ..... Gravel

Kind of crops raised .....

MUNICIPAL SUPPLY— **G 4924**

13. To supply the city of Milton-Freewater

in Umatilla county, having a present population of 4,510

and an estimated population of 5,000 in 1980

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. Estimated cost of proposed works, $ 20,000

15. Construction work will begin on or before January 15 1971

16. Construction work will be completed on or before May 15, 1971

17. The water will be completely applied to the proposed use on or before October 1, 1971

18. If the ground water supply is supplemental to an existing water supply, identify any application for permit, permit, certificate or adjudicated right to appropriate water, made or held by the applicant. Permit No. U-102 allows a water right for 1.5 C.F.S. on Well No. 1 dated January 18, 1937

(Signature of applicant)

Remarks: It is the intent of this Application for water right to allow the City of Milton-Freewater to rework existing Well No. 1. Permit No. U-102 and develop additional water up to a capacity of 3.5 c.f.s. or 1573 G.P.M. The City Of Milton-Freewater does not wish to change the priority date of the existing Permit No. U-102, for 1.5 c.f.s., dated Jan. 18, 1937.

Work to be done on the well includes sealing recorded perforations at 50', checking seal into basalt and deepening well in an attempt to improve the capacity of the well. Also when a pump is installed after reworking the discharge flange will be installed above ground and well casing will be extended above ground level to meet State of Oregon requirements.

STATE OF OREGON, }
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ....., 19.....

WITNESS my hand this ..... day of ....., 19.....

STATE ENGINEER

By .....
ASSISTANT

STATE OF OREGON, }
County of Marion, } ss.

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 2.0 cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from Well No. 1

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to ..... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year; .....

and shall be subject to such reasonable rotation system as may be ordered by the proper state offi...

The well shall be cased as necessary in accordance with good practice and if the flow is artesian the works shall include proper capping and control valve to prevent the waste of ground water.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is January 4, 1971

Actual construction work shall begin on or before November 23, 1972 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1973
Extended to Oct. 1, 1984 Extended to Oct. 1979

Complete application of the water to the proposed use shall be made on or before October 1, 1974
Extended to Oct. 1, 1984 Extended to Oct. 1979

WITNESS my hand this 23rd day of November, 1971

STATE ENGINEER

BC - Extended to October 1, 1989) 10-1-84) 10-1-94

Application No. G-5389
Permit No. G- 4924

PERMIT
TO APPROPRIATE THE GROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 4th day of January, 1971, at 8:00 o'clock A. M.

Returned to applicant:

Approved:
November 23, 1971

Recorded in book No. ..... of
Ground Water Permits on page G-4924

CHRIS L. WHEELER
STATE ENGINEER

Drainage Basin No. 1 page 4B

27 20

Umat 5999

RECEIVED

APR 11 1994

WATER RESOURCES DEPT.
SALEM, OREGON

5N/35E/1266

(START CARD) # 53358

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

(1) OWNER: Well Number #1
Name City of Milton Freewater
Address PO Box 6
City Milton Freewater State OR Zip 97862

(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 Municipal

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 584 ft.
Explosives used ☐ Yes ☒ No Type _____ Amount _____

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
12	0	584	NA			

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:					☐	☐	☐	☐
			NA		☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

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

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
		NA				☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

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

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 Umatilla Latitude ____ Longitude ____
Township 5 ☒ N or S. Range 35 ☐ E or W. WM.
Section 12 NW ¼ NW ¼
Tax Lot 06500 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) SE 9th & Mill St.

(10) STATIC WATER LEVEL:
228 ft. below land surface. Date 3-29-94
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 228

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground elevation ____

Material	From	To	SWL
Ran 12" Stabilizers down well to straighten for lowering of Turbine pump			
Cleaned well out To 584 ft.			
Stabilizers reamed off side of well 584 ft. is starting new hole			

Date started 3-8-94 Completed 3-29-94

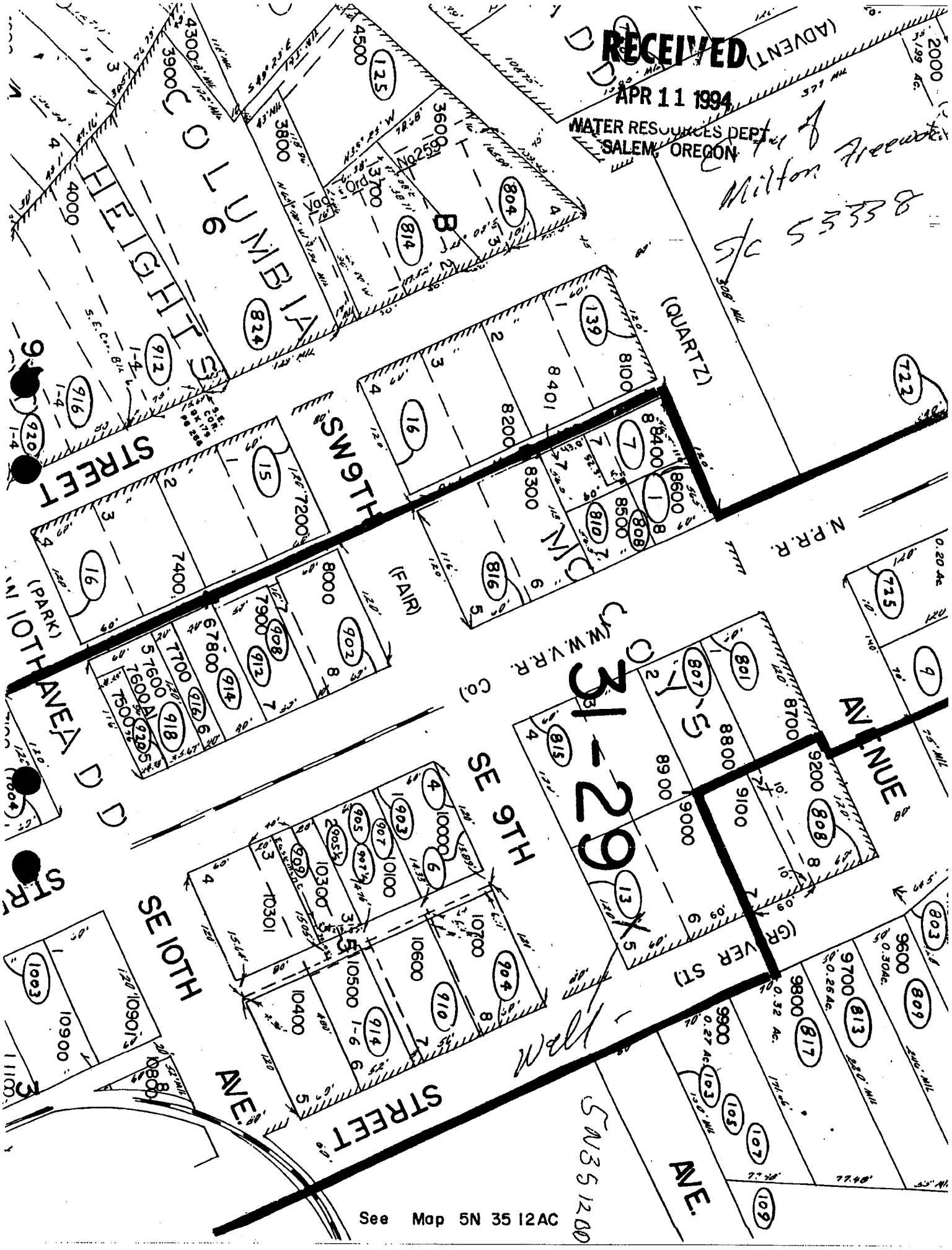
(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

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 well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 259
Signed [signature] Date 3-31-94

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91


RECEIVED
APR 11 1994
WATER RESOURCES DEPT
SALEM, OREGON
COLUMBIA HEIGHTS
SW 9TH STREET
SE 9TH STREET
SE 10TH AVE.
(QUARTZ)
(FAIR)
(PARK)
N.P.R.R.
(GRAVER ST)
AVENUE
AVE.
See Map 5N 35 12AC

Well No. 2

Permit A-1—1M—7-41

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That MILTON CITY, a municipal corporation of Milton, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of a well a tributary of for the purpose of municipal under Permit No. U-150 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from February 28, 1944;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.0 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SE¼ NW¼, Section 12, Township 5 North, Range 35 East, W. M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

SW¼ NW¼,
NW¼ SW¼,
SW¼ SW¼,
SE¼ SW¼,
Section 1,
SW¼ NE¼,
SE¼ NE¼,
SE¼,
Section 2,

NE¼ NE¼,
Section 11,
NW¼ NE¼,
SW¼ NE¼,
SE¼ NE¼,
NW¼,
NE¼ SW¼,
NW¼ SW¼,
SE¼ SW¼,
SE¼,
Section 12,

T. 5 N., R. 35 E., W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

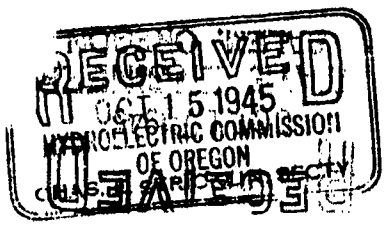
WITNESS the signature of the State Engineer, affixed this 1st day of March, 1949.

CHAS. E. STRICKLIN
State Engineer

Recorded in State Record of Water Right Certificates, Volume 13, page 15548

Well # 2

5N/35-12 P(2)
UMATILLA



UMAT 3962
3962
OBSERVATION WELL

Application No. U 159
Permit No. U 150
Well No. #2

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report October 10, , 1945

1. Location of well: SE ¼ of NW ¼ of Section 12 Twp. 5 N Rge. 35E , W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1,500 feet.
4. If the well is less than 1500 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: feet.
5. Date of beginning drilling or digging May 6, 1944
6. Date well was completed

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	ft.
Gravel (cement)	28 ft.	42 ft.
Black Basalt	70 ft.	146 ft.
Brown Rock	216 ft.	14 ft.
Black & Brown Basalt	230 ft.	331 ft.
Gray Basalt	561 ft.	93 ft.
Black & Gray Basalt	654 ft.	67 ft.
Brown Basalt	721 ft.	40 ft.
Red & Gray Rock	761 ft.	4 ft.
Black & Gray Basalt	765 - 902'	137 ft.

Remarks: 902 ' total depth of well. From 230' - 902' static water level was 105'.

WELL INFORMATION

8. Diameter of well inches. Depth of well 902' feet.
9. Depth at which water was first encountered 230 feet.
10. Water level when completed: 105 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Water first encountered at 57' depth of well with water level 17' 6" below ground level. Cased out, casing extending to a depth of 99'.

UMAT 3962 Well # 2

5N/35-12 F12)
UMATILLA

PUMP INFORMATION

12. Manufacturer of pump: Peerless Pump Company - Los Angeles, Calif.
13. Address:
14. Data on name or base plate: Serial No. 24875 Bottom bowls 260' column Size 12" MA. Stage 10., Type head 14B., Suction 10" Standard, Size discharge 10" Std.
15. Data on pump bowl assembly:
16. Size of pump: 12" MA
17. Rated capacity: 1,000 gallons per minute.
18. Rated speed: 1,800 RPM revolutions per minute.
19. Number of stages: 10
20. Size of intake pipe: 12
21. Size of discharge pipe: 10"
22. Length of intake pipe: 260' (Column)
23. Length of discharge pipe: 30'
24. Suction lift: (difference in elevation between water surface in well and pump) 170'
25. Discharge lift: (difference in elevation between pump and end of discharge line) Pumping against 65 lb. main pressure.
26. Depth of pump intake below ground surface: 260' feet.
27. Remarks:

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: U. S. Electric
29. Address: Los Angeles, Calif.
30. Type of motor or engine: C. F. U.
31. Data on name or base plate: Serial No. 49¢345., HP - 125., RPM - 1800., Frame 984A., Volts 2300., Phase 3., Cycle 60.
32. Rated horsepower: 125
33. Rated speed of motor or engine: 1800 revolutions per minute.

34. Rated Capacity of Pump (with described motor)	1000 g.p.m. at 400 ft. head g.p.m. at ft. head g.p.m. at ft. head g.p.m. at ft. head g.p.m. at ft. head

35. Remarks:

UMAT 3962 Well # 2

5N/35-12 F(2)
UMATILLA
#2

CAPACITY TEST

36. Date of test: 9-21-45 37. Temperature of water 55 °F. or ____ °C.
38. Motor speed during test: 1780 & 1785
39. Test made by (weir, tank or other means): 6" Orifice - calibrated.

40. Pounds pressure	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	▭ Draw-down	+Time
101 lbs.	Gauge at pump	Total 178 ft. ___ in.	986	107 ft.	71 ft.	11:30 M. A.M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
60 lbs.	Gauge at pump	Total 195 ft. ___ in.	1135	107 ft.	88 ft.	1:40A M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
100 lbs.	Gauge at pump	Total 172 ft. ___ in.	990	107 ft.	65 ft.	1:30P M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.
___ lbs.	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	M.

* Difference in elevation between water level in well and outlet of pump test line. 107'
° Distance from ground level to water surface in well. 105' Static
▭ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 400 ft.
42. Water is discharged into: City water mains.
43. Was water lowered to pump intake by test? Drawn down to depth of 178'
44. Remarks: While running only. Returned to 107' static level when stopped.

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand & Son
Address: Walla Walla, Wash.
46. Pump and motor were installed by: A. A. Durand & Son under supervision of B.M.Kunes Address: Peerless Pump Co. Los Angeles Calif.
47. Capacity test was made by: B. M. Kunes, Peerless Pump Co.
Address: Los Angeles, Calif.
48. General remarks:

Report made by ____________
(sign here)

STATE ENGINEER
Salem, Oregon

UMAT 3962 Well # 2

State Well No. 5N/35-12F(2)

County UMATILLA

Application No. .....

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. # 2

Description of measuring point: .....

Date	Water Level Feet (above) (below) Land Surface	Remarks: DATE	WATER LEVEL	Date	Water Level Feet (above) (below) Land Surface	Remarks: DATE	WATER LEVEL
9-21-45	105	11-55	140	10-58	152	2-62	167
9-17-51	132	12	140	3-59	142	3	167
3-54	138	1-56	140	5	152	6	182
4	138	2	142	7	170	8	187
5	135	3	140	8	165	12	183
6	147	5	144	12	165	1-63	176
7	155	6	155	2-60	175	2	178
9	136	7	164	4	160	3	176
10	132	8	155	6	175	4	172
11	135	10	160	7	184	6	197
12	148	10-57	163	11	173	8	202
1-55	136	11	160	12	170	9	203
2	133	12	158	1-61	168	11-18	185
3	134	4-58	165	3	165	12-21	180
4	134	5	166	6	180	1-20-64	178
5	150	7	170	7	175	2-24	175
6	147	8	165	11	170	3-17	175
9	142	9	165	1-62	169	4-27	170

REMARKS: .....

State Printing 66814

STATE ENGINEER
Salem, Oregon

UMAT 3962 Well # 2

State Well No. 5N/35-12F(2)

County UMATILLA

Application No. .....

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO. # 2

Description of measuring point: .....

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
5-25-64	172				
6-22	180				
7-13	195				
8-24	194				
10-26	194				
11-23	188				
12-21	182				

REMARKS: .....

State Printing 69814

STATE ENGINEER
Salem, Oregon

UMAT 3962 Well # 2

State Well No. 5/35-12F2

County Umatilla

Application No. .....

Chemical Analysis

OWNER City of Milton-Freewater ..... OWNER'S NO. 2

ANALYST U S G S ..... Address .....

Date of Collection Nov. 18, 1946

Point of Collection .....

	P.P.M.	M.P.M.
Silica (SiO_2)		
Iron (Fe) Total	0.0	
Manganese (Mn)		
Calcium (Ca)	17.	
Magnesium (Mg)	7.4	
Sodium (Na)	33.	
Potassium (K)		
Bicarbonate (HCO_3)	104.	
Carbonate (CO_3)		
Sulfate (SO_4)	9.9	
Chloride (Cl)	5.8	
Fluoride (F)	0.3	
Nitrate (NO_3)	0.2	
Boron (B)		
Dissolved Solids	106.	
Hardness as $CaCO_3$	73.	
Specific Conductance (Micromhos at 25°C)	18.	
pH		
Percent Sodium	30.	
Sodium Absorption Ratio (S.A.R.)		
CLASS		

State Printing 60813

UMAT 3962 Well # 2 5N/35-12F(2)

Umatilla

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Hilton-Freewater Description of source Well #2

Analysis by MP Date 11/[illegible]/54 Collected by [illegible] Date 6/25/54

RESULTS

Turbidity	[illegible]
Color: Apparent	True 2
Odor: Hot	Cold
Total Solids	167
Loss on Ignition	63
Silicon (SiO_2)	61
Chloride (Cl)	4.3
Sulfate (SO_4)	3.8
Calcium (Ca)	36
Magnesium (Mg)	20
[illegible]	
[illegible]	
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	85
Hardness (as $CaCO_3$)	71
Sodium [illegible] (as Na)	22
Iron (Fe)	.16
Manganese (Mn)	0
Fluoride (F)	.2
Carbon Dioxide (CO_2)	2.3
pH 7.9	
Remarks	

PHE-10

Permit A-3-UM-1-45

Well No. 3

1/2

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* MILTON CITY
A MUNICIPAL CORPORATION

of Milton *, State of* Oregon *, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of* Milton City Well No. 3, tributary to Walla Walla River *a tributary of* Columbia River *for the purpose of* municipal use *under Permit No.* U-172 *of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from* January 10, 1946 ;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.50 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NE¼ SE¼, Section 2, Township 5 North, Range 35 East, W. M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to ——— *of one cubic foot per second per acre,*

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

SW¼ NW¼
NW¼ SW¼
SW¼ SW¼
SE¼ SW¼
Section 1
SE¼ NE¼
SW¼ NE¼
NE¼ SE¼
NW¼ SE¼
SW¼ SE¼
SE¼ SE¼
Section 2
NE¼ NE¼
Section 11
NW¼ NE¼
SW¼ NE¼
SE¼ NE¼
NE¼ NW¼
NW¼ NW¼
SW¼ NW¼
SE¼ NW¼
NE¼ SW¼
NW¼ SW¼
SE¼ SW¼
NE¼ SE¼
NW¼ SE¼
SW¼ SE¼
SE¼ SE¼
Section 12
T. 5 N., R. 35 E., W. M.

Well No 3

2/2

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this 28th *day of* February , *19* 50 .

CHAS. E. STRICKLIN *State Engineer*

Recorded in State Record of Water Right Certificates, Volume 14 , *page* 16998

STATE ENGINEER
Salem, Oregon

UMAT 3930

OBSERVATION WELL
UMAT 3930
Well Record
Well # 3

STATE WELL NO. 5N/35-27dad
COUNTY UMATILLA
APPLICATION NO.

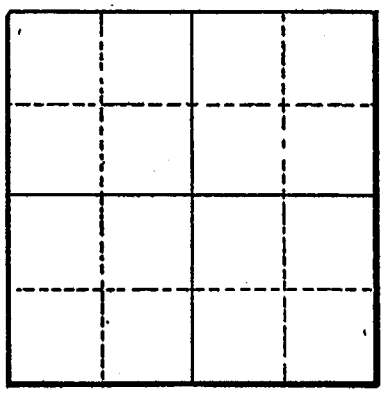
OWNER: Milton-Freewater
MAILING ADDRESS:
CITY AND STATE:

LOCATION OF WELL: Owner's No. 3

....¼ ....¼ Sec. .... T. .... N. S., R. .... E. W., W.M.

Bearing and distance from section or subdivision corner

Altitude at well 1,010+



Section

TYPE OF WELL: Drilled Date Constructed

Depth drilled 550 Depth cased 100

CASING RECORD:

20-16 inch

FINISH:

AQUIFERS:
Basalt

WATER LEVEL:

50 feet below land surface, June, 1946

PUMPING EQUIPMENT: Type Turbine H.P.
Capacity 1,500 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:

State Printing 83316

UMAT 3930 Umatilla

5N/35-2xD

Oregon State Board of Health 237 Well # 3 dad

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Milton-Freewater Description of source Pump 3

Analysis by MHF Date 11/12/53 Collected by _____ Date 6/25/53

RESULTS

	Parts per million
Turbidity	4
Color: Apparent _____ True	3
Odor: Hot _____ Cold	
Total Solids	164
Loss on Ignition	67
Silicon (SiO_2)	59
Chloride (Cl)	9.6
Sulfate (SO_4)	6.2
Calcium (Ca)	18
Magnesium (Mg)	11
Aluminum (Al)	0
Orthophosphates (PO_4)	.07
Metaphosphates ($PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	68
Hardness (as $CaCO_3$)	81
Sodium and Potassium (as Na)	15
Iron (Fe)	.17
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	2.9
pH 7.9	
Remarks	

PHE-10

STATE ENGINEER
Salem, Oregon

UMAT 3930 Well # 3

State Well No. 5/35-2J(1)

County UMATILLA

Application No. _____

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. #3

Description of measuring point: _____

Date	Water Level Feet (above) (below) Land Surface	DATE	WATER LEVEL	Date	Water Level Feet (above) (below) Land Surface	Remarks
6-46	50	10-55	80	7-61	83	
2-26-53	78	2-56	82	2-24-64	114	
2-54	98	5	78	3-17	109	
3-15	84	6	92	4-20	108	
3-30	105	7	105	5-18	106	
4	80	8	96	6-19	119	
5	78	11	85	7-6	129	
6	85	12	95	9-21	133	
8	90	1-57	88	10-26	132	
10-10	90	2	88	11-23	123	
10-30	86	3	84	12-11	116.6	
2-55	78	5-58	99			
3	78	10	98			
4	75	11	90			
5	78	12	86			
6	90	3-59	80			
8	92	5	90			
9	85	4-61	99			

REMARKS: _____

State Printing 89314

UMAT 3930

RECEIVED
DEC 30 1946
STATE ENGINEER
SALEM OREGON

Well # 3

5N/35-2J(1) UMATILLA dad

Milton Freewater

Application No. U 191
Permit No. U 172
Well No. 3

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report December 28, 1946

1. Location of well: N.E.1/4 of S.E1/4 of Section 2 Twp. 5 Rge. 35 E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 2670 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: feet.
5. Date of beginning drilling or digging January 27, 1946
6. Date well was completed June 1, 1946

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	40 ft.
Solid Rock	40 ft.	3 ft.
Black Basalt	43 ft.	133 ft.
Crevice and green shale	176 ft.	63 ft.
Black Basalt	239 ft.	10 ft.
Brown Rock	249 ft.	14 ft.
Black Basalt	263 ft.	24 ft.
Brown Rock	287 ft.	201 ft.
Black Basalt	488 ft.	3 ft.
Loose Gray Stone	491 ft.	47 ft.
Hard Black Basalt	538 ft.	12 ft.
Black Porous Rock		

Remarks: Some Crevices at 209-218 feet; brown rock caved at 285 feet.

WELL INFORMATION

8. Diameter of well 16" I.D. inches. Depth of well 550 feet.
9. Depth at which water was first encountered 60 feet.
10. Water level when completed: 50 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: 20" casing to depth of 43 feet. 16" casing inside of 20" and to depth of 100 feet below surface. Cement seal between 20" and 16" casing at 40-43 feet. Balance filled with cuttings.

NC

Well # 3

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
MAR 10 1969
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3924

State Well No. 5N/35-2 da

State Permit No. 6172

(1) OWNER:
Name MINTON CITY ORE.
Address MINTON FREEWATER ORE.

(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 ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

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.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... 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) WATER LEVEL: Completed well.
Static level 130 ft. below land surface Date 1-27-69
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test 180 gal./min. with 8 ft. drawdown after 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used CEMENT - BENTONITE
Depth of seal 105 ft.
Diameter of well bore to bottom of seal 16 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth .....
Was a drive shoe used? ☐ Yes ☐ No
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.

(11) LOCATION OF WELL:
County UMATILLA Driller's well number
NE ¼ SE ¼ Section 2 T. 5 R. 35 E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing 16
Depth drilled 575 ft. Depth of completed well 575 ft. OK

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.

MATERIAL	From	To	SWL
BLACK BASALT	535	575	40

Work started 12-19 1969 Completed 2-4 1969
Date well drilling machine moved off of well 2-4- 1969

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] [illegible] Date 2-4, 1969
(Drilling Machine Operator)
Drilling Machine Operator's License No. 230

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 CHARLES JUNGMANN DRILLING CO.
(Person, firm or corporation) (Type or print)
Address 165 REES AVE. W. W. WASH.
[Signed] [illegible]
(Water Well Contractor)
Contractor's License No. 336 Date 2-24, 1969

(USE ADDITIONAL SHEETS IF NECESSARY)

23533

RECEIVED
APR 8 1955
STATE ENGINEER
SALEM, OREGON

Permit No. U-718

APPLICATION FOR A PERMIT

To Appropriate the Underground Waters of the State of Oregon

I, Milton-Freewater (Name of applicant)

of Milton-Freewater (Postoffice), county of Umatilla,

state of Oregon, do hereby make application for a permit to appropriate the following described underground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS.

If the applicant is a corporation, give date and place of incorporation

Milton-Freewater, Oregon January 1, 1951

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Little Walla Walla River (Name of stream)

tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 2.7 cubic feet per second

3. The use to which the water is to be applied is Domestic and Commercial

4. The place where the water is to be pumped or developed is located 2" Iron Pipe is N 32° - 2' E 365.5 ft. of 1/4 corner between sections 1 & 2 T 5 N. R. 35 EWM (Give distance and bearing from section corner)
2" pipe is S. 50° - 35' W. of well in S.W. ¼ of N.W.¼ sec. 1 Twp. 5NR. 35 EWM

S.W. ¼

being within the of Sec. , Twp , R. ,

W. M., in the county of Umatilla

5. The (Canal or pipe line) to be miles in length, terminating in the (Smallest legal subdivision) of Sec. , Twp. , R. , W. M., the proposed location being shown throughout on the accompanying map.

6. The name of the well or other works is Well No. 5

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of one well (Give number of wells, tunnels, etc.) having a diameter of 8" O.D. pipe inches and an estimated depth of 502 feet.

This well pumps directly into the water system.

U-718

CANAL SYSTEM OR PIPE LINE—

9. (a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(b) At ..... miles from headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(c) Length of pipe, ... ft.; size at intake, ... in.; in size at ..... ft. from intake ..... in.; size at place of use ..... in.; difference in elevation between intake and place of use, ... ft. Is grade uniform? ..... Estimated capacity, ... sec. ft.

10. If pumps are to be used, give size and type ..... Peerless turbine 1200 G.P.M.

Give capacity and type of motor or engine to be used 150 H.P. U.S. Motor

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to be the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

35 feet to Little Walla Walla River (no difference in elevation)

Little Walla Walla River in reality is a power canal to operate flour mill

12. Location of area to be irrigated, or place of use Water system of former City of Freewater

Township	Range	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 N	35 EWM	1	N.W. ¼ of N.W. ¼	
			S.W. ¼ of N. W. ¼	
			N½ of N.E.¼ of S.W.¼	
5 N	35 EWM	2	N/E ¼ of N.W. ¼	
			S.E. ¼ of N.W. ¼	
			N.E.¼ of N.E.¼	
			N.W. ¼ of N.E.¼	
			S.W. ¼ of N.E. ¼	
			S.E. ¼ of N.E.¼	

(If more space required, attach separate sheet)

(a) Character of soil .....

(b) Kind of crops raised .....

MUNICIPAL SUPPLY—

13. (a) To supply the city of To supply portion of City of Milton-Freewater Umatilla (Name of) county, having a present population of 3851 and an estimated population of ..... in 1960

U-718

Appraised value

14. Estimated cost of proposed work $ 11,000.00

15. Construction work will begin on or before Completed in 1954

16. Construction work will be completed on or before

17. The water will be completely applied to the proposed use on or before This well has been in operation since 1936.

Robert L. Bunton
(Signature of applicant)

City Manager

Remarks: In Item 2, the amount requested is slightly higher than we are now using because some time in the future we may want to put in larger pumps. This was accomplished in June 1954 and the above notes are the status of the present setting.

In case you do not have the log of this well, below is a copy:

Well #5 Drilled by A. A. Durand & Son 1936

Altitude of top of ground above sea level 995

Log

Recent alluvium and old gravel

	Thickness Ft.	Depth Ft.
Soil	3	3
Gravel, loose	77	80
Clay	10	90
Boulders & Gravel	45	135
Clay & Sand	10	145
Gravel & Loose Boulders	15	160
Basalt Black, Hard	85	245
Basalt Red, Porous	45	290
Basalt Blue, Black	115	405
Basalt Red	30	435
Basalt Black Water Bearing	67	502

Casing 18" set to 40 ft.
12" set to 172 ft.

STATE OF OREGON,
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before , 19

WITNESS my hand this day of , 19

STATE ENGINEER

STATE OF OREGON, } PERMIT
County of Marion, } ss.

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 2.70 cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from Well No. 5

The use to which this water is to be applied is [redacted] municipal

If for irrigation, this appropriation shall be limited to - - - - of one cubic foot per second

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be so cased as to prevent the loss of underground water.

The priority date of this permit is April 13, 1955.

Actual construction work shall begin on or before July 20, 1956 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1957

Complete application of the water to the proposed use shall be made on or before October 1, 1958

WITNESS my hand this 20th day of July, 19 55.

Lewis A. Stanley
STATE ENGINEER

Application No. U-809
Permit No. M-718

PERMIT
TO APPROPRIATE THE UNDERGROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 13th day of April, 1955, at 1:00 o'clock P. M.

Returned to applicant:

Corrected application received:

Approved:
July 20, 1955

Recorded in book No. 3 of Permits on page U-718

LEWIS A. STANLEY STATE ENGINEER

Drainage Basin No. 7 Page 24C

Fees Paid $24.00

State Printing Dept. 31158

Permit A-1 (Rev. 1-8)

State Printing Dept. 1951

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Milton-Freewater, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Well No. 5

a tributary of Little Walla Walla River, trib. of Columbia River for the purpose of municipal

under Permit No. U-718 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from April 13, 1955

;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 2.70 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the $SW\frac{1}{4}SW\frac{1}{4}NW\frac{1}{4}$, Section 1, Township 5 North, Range 35 East, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

$NW\frac{1}{4}NW\frac{1}{4}$
$SW\frac{1}{4}NW\frac{1}{4}$
$N\frac{1}{2}$ $NE\frac{1}{4}SW\frac{1}{4}$
Section 1
$NE\frac{1}{4}NW\frac{1}{4}$
$SE\frac{1}{4}NW\frac{1}{4}$
$NE\frac{1}{4}NE\frac{1}{4}$
$NW\frac{1}{4}NE\frac{1}{4}$
$SW\frac{1}{4}NE\frac{1}{4}$
$SE\frac{1}{4}NE\frac{1}{4}$
Section 2
Township 5 North, Range 35 East, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 20th day of December, 1957.

LEWIS A. STANLEY
State Engineer

Recorded in State Record of Water Right Certificates, Volume 17, page 23533.

STATE ENGINEER
Salem, Oregon

UMAT 3909

Well Record

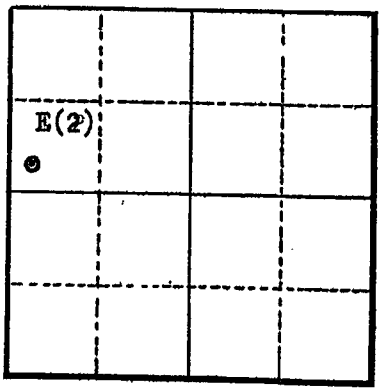
STATE WELL NO. 5N/35-1E(2)
COUNTY Umatilla
APPLICATION NO. U- 809

OWNER: City of Milton-Freewater
MAILING ADDRESS:
CITY AND STATE: Milton-Freewater, Oregon

LOCATION OF WELL: Owner's No. 5

SW ¼ NW ¼ Sec. 1 T. 5 ~~S~~ N., R. 35 ~~W~~ E., W.M.

Bearing and distance from section or subdivision corner N. 32°2'E. 365.5' from W¼ cor. of sec. 1 to a 2" iron pipe, thence S.50°35'W. 31.5' to the well.



Section 1

Altitude at well 995'

TYPE OF WELL: Drilled Date Constructed 1936

Depth drilled 502' Depth cased 212'

CASING RECORD:
18 inch set from 0 to 40 feet
12 inch set from 40 to 212 feet

FINISH:

AQUIFERS:
Basalt from 435 to 502 feet

WATER LEVEL:
67 feet (10/5/54)
120 feet (5/1/57)

PUMPING EQUIPMENT: Type Peerless turbine H.P. 150
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown 47 ft. after hours 750 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Municipal Temp. °F., 19
SOURCE OF INFORMATION USGS U-718
DRILLER or DIGGER A.A. Durand & Son
ADDITIONAL DATA:
Log X Water Level Measurements X Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

Well # 5

State Well No. 5N/36-1E(2)
County UMATILLA
Application No. U80

Well Log

Owner: Milton-Freewater Owner's No. 5

Driller: A.A. Durand & Son Date Drilled 1936

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Soil	0	3	3
Gravel and boulders, partly cemented & partly loose	3	80	77
Clay	80	90	10
Boulders and gravel	90	135	45
Clay and sand	135	145	10
Gravel and boulders, loose	145	160	15
Basalt, black, hard	160	245	85
Basalt, red porous	245	290	45
Basalt, blue and black hard	290	405	115
Basalt, red	405	435	30
Basalt, black, water bearing	435	502	67

Umatilla Well # 5 5N/35-1E(2)

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Milton-Freewater Description of source Pump #5

Analysis by MHP Date 11/12/54 Collected by _____ Date 6/25/54

RESULTS

	Parts per million
Turbidity	2
Color: Apparent _____ True	3
Odor: Hot _____ Cold	
Total Solids	119
Loss on Ignition	59
Silicon (SiO_2)	18
Chloride (Cl)	7.6
Sulfate (SO_4)	3.7
Calcium (Ca)	15
Magnesium (Mg)	0.5
Aluminum (Al)	0
Orthophosphates (PO_4)	.35
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	70
Hardness (as $CaCO_3$)	65
Sodium [redacted] (as Na)	14
Iron (Fe)	.33
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	2.3

pH 7.8

Remarks _____

PHE-10

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-15(2)

County UMATILLA

Well # 5

Application No. U-809

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO.

Description of measuring point: MOUNT HOLE ON NE CORNER OF WELL 1.5' ABOVE L.S.D.

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks DATE	WATER LEVEL
11-9-61	101.21	RD & WSB	1-56	80	3-58	95
5-54	65		2	74	4	95
6	83		3	80	7	102
8	85		4	82	8	100
9	67		5	78		
10	73		10	89		
11	76		11	80		
12	72		12	80		
1-55	75		1-57	80		
2	70		2	81		
3	70		3	76		
4	68		4	80		
5	71		9	102		
8	86		10	98		
9	76		11	95		
10	74		12	86		
11	74		1-58	95		
12	82		2	95		

REMARKS:

State Printing 89814

WELL NO. 6 PAGE 1 OF 5

23519

APPLICATION FOR A PERMIT

...propriate the Underground Waters of the State of Oregon

I, City of Milton-Freewater, Oregon
(Name of applicant)

of Milton, (Postoffice) county of Umatilla,

state of Oregon, do hereby make application for a permit to appropriate the following described underground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:

If the applicant is a corporation, give date and place of incorporation Charter Milton-Freewater January 1, 1951

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Walla Walla River (Name of stream) tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 3.5 cubic feet per second.

3. The use to which the water is to be applied is City Water Supply (Domestic and Industrial)

4. The place where the water is to be pumped or developed is located 2nd I.P. = S 86° 44' W - 527. feet from center Section 2 Twp 5 N. Range 35 EWM (Give distance and bearing from section corner) and Well is S. 22° 37' E. - 39 from Iron Pipe

being within the N.E. ¼ of S.W. ¼ of Sec. 2 Twp. 5 N R. 35 E. W. M., in the county of Umatilla

5. The 8" Pipe Line (Canal or pipe line) to be 15 feet in length, terminating in the N.E. ¼ of S.W. ¼ (Smallest legal subdivision) of Sec. 2 Twp. 5 N R. 35 E, W. M., the proposed location being shown throughout on the accompanying map.

6. The name of the well or other works is Milton-Freewater Well No. 6

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of one (Give number of wells, tunnels, etc.) having a diameter of 12 inches and an estimated depth of 952 feet

[redacted] in size, stating miles from [redacted] feet; width on bottom [redacted] depth of water [redacted] feet; grade [redacted] feet fall per one [redacted] miles from headgate; width on top (at water line) [redacted] feet; width on bottom [redacted] feet; depth of water [redacted] feet; [redacted] feet fall per one thousand feet.

(g) Length of pipe, [redacted] ft.; size at intake, [redacted] in.; in size at [redacted] ft. [redacted] in.; size at place of use [redacted] in.; difference in elevation between intake and place of use, [redacted] ft. Is grade uniform? [redacted] Estimated capacity, [redacted] sec. ft.

10. If pumps are to be used, give size and type Cook Deep Well Turbine Pump - 7 stages; 2" shaft; 150 feet of 10" Column @ 1300 GPM 305 Ft.

Give capacity and type of motor or engine to be used 125 HP General Electric Motor - 220/440

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to be the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

12. Location of area to be irrigated, or place of use in water system of former city of Freewater

Township [redacted]	Range	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 N	35 EWM	1	N.W. ¼ of N. W. ¼	
			S.W. ¼ of N.W. ¼	
			N½ of N. E. ¼ of S.W.¼	
		2	N.E. ¼ of N.W. ¼	
			S.E. ¼ of N.W.¼	
			N.E. ¼ of N.E. ¼	
			N.W. ¼ of N.E. ¼	
			S.W. ¼ of N.E. ¼	
			S.E. ¼ of N. E.¼	

(If more space required, attach separate sheet)

(a) Character of soil .....

(b) Kind of crops raised .....

MUNICIPAL SUPPLY—

13. (a) To supply the city of Milton-Freewater

Umatilla (Name of) county, having a present population of 3851

and an estimated population of ..... in 19.....

W-[illegible]

...drilling is completed on or before Pump installation - July, 1952

...water will be completely applied to the proposed use on or before March 1, 1952

City of Milton-Freewater
by: Robert L. [illegible]
Robert L. Bunton
City Manager.

Remarks: This well was drilled by the former City of Freewater in 1950 and abandoned as being dry. The City of Milton-Freewater has been running test on this well for sometime and has found an adequate water supply. The water was tested by the State and found to conform to standards of purity for drinking water. However, the well is now in the process of being sealed off.

STATE OF OREGON,
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ....., 19

WITNESS my hand this ..... *day of* ..... .19

STATE ENGINEER

...by that I have examined the foregoing application and do hereby grant the same, ...ING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and ...not exceed 3.50 cubic feet per second measured at the point of diversion from the well or ...ace of appropriation, or its equivalent in case of rotation with other water users, from Milton-Freewater ...l No. 6

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to - - - - - of one cubic foot per second

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be so cased as to prevent the loss of underground water.

The priority date of this permit is July 16, 1952

Actual construction work shall begin on or before August 29, 1953 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1954

Complete application of the water to the proposed use shall be made on or before October 1, 1955

WITNESS my hand this 29th day of August, 1952

Chas E Stricklin
STATE ENGINEER

Application No. 41-311
Permit No. 11-462

PERMIT
TO APPROPRIATE THE UNDERGROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 16th day of July, 1952, at 1:00 o'clock P. M.

Returned to applicant:

Corrected application received:

Approved:
August 29, 1952

Recorded in book No. 2 of Permits on page 462

CHAS. E. STRICKLIN
STATE ENGINEER

Drainage Basin No. 7 Page 4C

Fees Paid $26.00

State Printing Dept. 3/56

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Milton-Freewater, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Milton-Freewater Well No. 6 a tributary of Walla Walla River for the purpose of municipal under Permit No. U-462 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from July 16, 1952;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.50 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NE¼SW¼, Section 2, Township 5 North, Range 35 East, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to _____ of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

NW¼NW¼
SW¼NW¼
N½NE¼SW¼
Section 1
NE¼NW¼
SE¼NW¼
NE¼NE¼
NW¼NE¼
SW¼NE¼
SE¼NE¼
Section 2
Township 5 North, Range 35 East, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 20th day of December, 1957.

LEWIS A. STANLEY State Engineer

Recorded in State Record of Water Right Certificates, Volume 17, page 23519.

STATE ENGINEER
Salem, Oregon

UMAT 3929

OBSERVATION WELL

UMAT 3929 **Well Record**

Well # 6

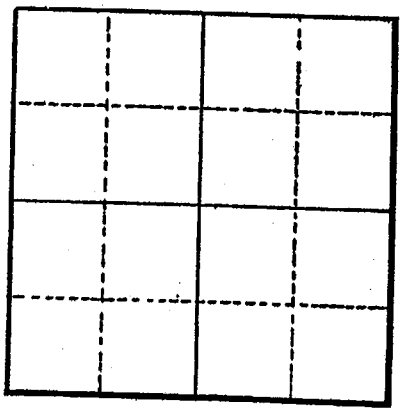
STATE WELL NO. 5N/35-2L1
COUNTY UMATILLA
APPLICATION NO. U-511

OWNER: CITY OF MILTON FREEWATER MAILING ADDRESS: MILTON FREEWATER

LOCATION OF WELL: Owner's No. 6 CITY AND STATE:

NE ¼ SW ¼ Sec. 2 T. 5 ~~S.~~ N., R. 35 ~~W.~~ E., W.M.

Bearing and distance from section or subdivision corner



Section 2

Altitude at well

TYPE OF WELL: DRILLED Date Constructed 12-22-50

Depth drilled 952' Depth cased 61'

CASING RECORD:

16 INCH
12 INCH

FINISH:

AQUIFERS:

BASALT

WATER LEVEL:

71' (12-22-50)

PUMPING EQUIPMENT: Type COOK H.P. 125
Capacity 1500 G.P.M.

WELL TESTS:

Drawdown ft. after hours G.P.M.

Drawdown ft. after hours G.P.M.

USE OF WATER MUNICIPAL Temp. °F., 19
SOURCE OF INFORMATION U-511
DRILLER or DIGGER GEO. SCOTT
ADDITIONAL DATA:

Log ✓ Water Level Measurements ✓ Chemical Analysis ✓ Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

UMAT 3929

Well # 6

State Well No. 5N/35-2L(1) cad

County UMATILLA

Application No. .....

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. #6

Description of measuring point: .....

Date	Water Level Feet (below) Land Surface	Remarks	DATE	WATER LEVEL	Date	Water Level Feet (below) Land Surface	Remarks
4-54	78		5-57	76	6-60	95	
10	95		9	82	8	85	
11	88		10	80	10	82	
12	85		11	72	3-61	97	
1-55	85		12	78	4	95	
2	82		1-58	80	11	100	
3	82		4	74	12	95	
4	78		9	85	1-62	100	
5	74		4-59	97	2-	98	
7	82		8	88	9	110	
12	86		9	85	11	105	
1-56	80		10	85	12	105	
2	76		11	84	1-63	100	
3	76		12	85	2	98	
4	73		1-60	87	5	110	
5	70		2	80	6	113	
8	80		3	100	8	119	
9	74		4	92			

REMARKS: .....

State Printing 89314

Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Well # 6

Date of Report Oct 7, 1952

1. Location of well: N.E.¼ – S.W.¼ of Section 2 Twp. 5N. Rge. 35 E W. M.
2. Name of nearest natural surface stream Little Walla Walla River
3. Distance from well to that stream: 3200 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: _____ feet.
5. Date of beginning drilling or digging. Aug. 11 1950
6. Date well was completed Dec. 22 1950

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Soil & Dirty Gravel	At surface	6 ft.
Soil & Dirty Gravel	55 6 ft.	55 ft.
Basalt (Broken)	55 ft.	20 ft.
" Black (Water 81)	81 ft.	120 ft.
" " Creviced	201 ft.	13 ft.
" Broken	214 ft.	63 ft.
" Broken - Yellow Clay	277 ft.	19 ft.
" Clean - Hard	296 ft.	55 ft.
" Broken Fault Zone Matl.	351 ft.	601 ft.

Remarks: Depth 952

WELL INFORMATION

8. Diameter of well _____ inches. Depth of well 952 feet.
9. Depth at which water was first encountered _____ feet.
10. Water level when completed: 81 71 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: _____

39. Test made by (weir, tank or other means): *Open Pipe.* Well # 6

40.

Pounds pressure	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	¤Draw-down	+Time
0 lbs.,	Gauge at pump	Total 0 ft. __ in.	0	71 ft.	0 ft.	0 M.
33 lbs.,	Gauge at pump	Total 79.5 ft. __ in.	515	77.5 ft.	6.5 ft.	45 M.
36 lbs.,	Gauge at pump	Total 85.3 ft. __ in.	840	83.3 ft.	12.3 ft.	30 M.
44 lbs.,	Gauge at pump	Total 102.6 ft. __ in.	1410	100.6 ft.	29.6 ft.	240 M.
43 lbs.,	Gauge at pump	Total 101.5 ft. __ in.	1400	99.5 ft.	28.5 ft.	15 M.
42 lbs.,	Gauge at pump	Total 101.0 ft. __ in.	985	99.0 ft.	28.0 ft.	15 M.
37 lbs.,	Gauge at pump	Total 88.75 ft. __ in.	565	87.0 ft.	16 ft.	15 M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.
lbs.,	Gauge at pump	Total ft. in.		ft.	ft.	M.

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
¤ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of *56* ft.

42. Water is discharged into: *Reservoir via 8" discharge main*

43. Was water lowered to pump intake by test? *(?)*

44. Remarks: *In the installation we have head was 56 ft for 24 hrs.*

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: *George Scott*
Address: *Milton-Freewater*

46. Pump and motor were installed by: *Pump, Pipe & Power Co*
Address: *Box 7762 Portland Oregon*

47. Capacity test was made by: *Pump, Pipe & Power Co. (C. Garbe)*
Address: *Box 7762 Portland Oregon*

48. General remarks:

13. Address: 301 W. Avenue 26 Los Angeles (31) Calif.
14. Data on name or base plate:

—Well # 6 —

15. Data on pump bowl assembly:

16. Size of pump: 12"
17. Rated capacity: 1500 gallons per minute.
18. Rated speed: 1750 revolutions per minute.
19. Number of stages: 7
20. Size of intake pipe: 8
21. Size of discharge pipe: 10
22. Length of intake pipe: 20
23. Length of discharge pipe: 150
24. Suction lift: (difference in elevation between water surface in well and pump) 79
25. Discharge lift: (difference in elevation between pump and end of discharge line) 150
26. Depth of pump intake below ground surface: 177 feet.
27. Remarks:

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: General Electric Co
29. Address: Schenectady N.Y.
30. Type of motor or engine: K Code F.
31. Data on name or base plate:
Frame 505 P 3 Phase 440 Volt.
60 C.Y. Fl. Amp. 150
50 C.Y. Fl. Amp 162
32. Rated horsepower: 125
33. Rated speed of motor or engine: 1760 revolutions per minute.

34. Rated Capacity of Pump (with described motor)

_____ g.p.m. at _____ ft. head
_____ g.p.m. at _____ ft. head
_____ g.p.m. at _____ ft. head
_____ g.p.m. at _____ ft. head
_____ g.p.m. at _____ ft. head

35. Remarks:

NO[redacted] WATER WELL CONTRACTOR
e original and first cop
f this report are to be
filed with the
STATE ENGINEER, SALEM, OREGON
within 30 days from the dat
of well completion.

RECEIVED
APR 6 - 1972
STATE ENGINEER
SALEM, OREGON

NC

Well # 6

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3923

State Well No. 5N/35-2ca

State Permit No. U-462

(1) OWNER:
Name City of Milton FREEWATER
Address P.O. Box 108 Milton Fewtr. ORE 97862

(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 ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☐ Welded ☒
12 " Diam. from +1 ft. to 232 ft. Gage .280
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

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
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
Was a pump test made? ☒ Yes ☐ No If yes, by whom?
Yield: 1,500 gal./min. with 145 ft. drawdown after 10 hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 60° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used 12" CASING, CEMENT
Well sealed from land surface to 232' ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 12 in.
Number of sacks of cement used in well seal 250 sacks
Number of sacks of bentonite used in well seal sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water 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? 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 Umatilla Driller's well number
NE ¼ SW ¼ Section 2 T. 5N R. 35 E W.M.
Bearing and distance from section or subdivision corner
[redacted] 586°44'W 527' From Ctr. Sec.

(11) WATER LEVEL: Completed well.
Depth at which water was first found ft.
Static level 187 ft. below land surface. Date 8-29-72
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 12
Depth drilled 915 ft. Depth of completed well 915 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
SEE PREVIOUS LOG			

Work started 12-6 1971 Completed 2-29 1972
Date well drilling machine moved off of well 2-25 1972

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] [signature] (Drilling Machine Operator) Date 3-30 1972
Drilling Machine Operator's License No. 361

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 CHARLES JUNGMANN DRILLING CO (Person, firm or corporation) (Type or print)
Address 115 REED AVE. W. W. WASH.
[Signed] [signature] (Water Well Contractor)
Contractor's License No. 236 Date 3-30, 1972

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

WELL NO. 8 PAGE 1 OF 5

41311

Permit No. G- 2312

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Milton-Freewater, a municipal corporation
(Name of applicant)

of Box 108 Milton-Freewater, county of Umatilla,
(Postoffice Address)

state of Oregon, *do hereby make application for a permit to appropriate the following described ground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:*

If the applicant is a corporation, give date and place of incorporation

December 27, 1950 at Milton-Freewater, Oregon

1. Give name of nearest stream to which the well, tunnel or other source of water development is

situated Walla Walla River
(Name of stream)

tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 6.6 *cubic feet per second or* 3000 *gallons per minute.*

3. The use to which the water is to be applied is Municipal Supply

4. The well or other source is located ft (N or S) and ft (E or W) *from the corner of*
(Section or subdivision)

The well lies N. 33°35' East a distance of 2143' from the S. W. corner
(If preferable, give distance and bearing to section corner)

of Section 18, Township 5 North, Range 36 East of Willamet Meridian.
(If there is more than one well each must be described. Use separate sheet if necessary)

being within the S. W. ¼ (NW¼ SW¼) of Sec. 18, Twp. 5 N., R. 36 E., W. M., in the county of Umatilla

5. The Pipeline (Canal or pipe line) to be 5.9 *miles in length, terminating in the* S. W. ¼ of S. E. ¼ (Smallest legal subdivision) *of Sec.* 12, *Twp.* 5N., R. 35 E., W. M., *the proposed location being shown throughout on the accompanying map.*

6. The name of the well or other works is Milton-Freewater Well No.8

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

Capped well with discharge tee and gate valve

8. The development will consist of a well (Give number of wells, tunnels, etc.) *having a diameter of* 16 *inches and an estimated depth of* 1000 *feet. It is estimated that* 30 *feet of the well will require* Steel (Kind) *casing. Depth to water table is estimated* 10 (Feet)

01— —2.5M

G-2312

CANAL SYSTEM OR PIPE LINE—

9. (a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(b) At ..... miles from headgate: width on top (at water line) ..... feet; width on bottom ..... feet; depth of water ..... feet; grade ..... feet fall per one thousand feet.

(c) Length of pipe, 4800 ft.; size at intake, 12" in.; in size at 2500 ft. from intake 12 in.; size at place of use 12 in.; difference in elevation between intake and place of use, 165 ft. Is grade uniform? Approximate Estimated capacity. 8 sec. ft.

10. If pumps are to be used, give size and type 3000 GPM vertical turbine

Give horsepower and type of motor or engine to be used 150 HP VHS squirrel cage electric

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

100 ft. from channel or Walla Walla River. Stream bed is approximately 10 ft. below elevation of ground at well site.

12. Location of area to be irrigated, or place of use City of Milton-Freewater

Township N. or S.	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 North	35 East	1,2,11,12		2500
		1	NW¼ and SW¼	Municipal
		2	NE¼ and SE¼	"
			E½ NW¼	"
			NE¼ SW¼	"
		11	NE¼ NE¼	"
		12	W½ NE¼	"
			NW¼	"
			E½ SW¼	"
			NW¼ SW¼	"
			SE¼	"

(If more space required, attach separate sheet)

Character of soil gravel

Kind of crops raised .....

G- 2312

MUNICIPAL SUPPLY—

13. To supply the city of Milton-Freewater

in Umatilla county, having a present population of 4110 per 1960 census

and an estimated population of 5654 in 1980

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. Estimated cost of proposed works, $ 50,000

15. Construction work will begin on or before July 1, 1963

16. Construction work will be completed on or before July 1, 1964

17. The water will be completely applied to the proposed use on or before July 1, 1964

18. If the ground water supply is supplemental to an existing water supply, identify any application for permit, permit, certificate or adjudicated right to appropriate water, made or held by the applicant. Permit #7830, #2391 - Well Permits: U-462, U-150, U-717, U-718 U-102, U-172.

(Signature of applicant) City Recorder

Remarks:

STATE OF OREGON, }
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before , 19

WITNESS my hand this day of , 19

STATE ENGINEER

By

ASSISTANT

STATE OF OREGON, }
County of Marion, } ss.

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 6.6 cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from well No. 8

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to - - of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year;

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be cased as necessary in accordance with good practice and if the flow is artesian the works shall include proper capping and control valve to prevent the waste of ground water.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is December 13, 1962

Actual construction work shall begin on or before March 15, 1964 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1964

Complete application of the water to the proposed use shall be made on or before October 1, 1965

WITNESS my hand this 15th day of March, 1963

STATE ENGINEER

Application No. G-2502

Permit No. G-2312

PERMIT

TO APPROPRIATE THE GROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 13th day of December, 1962, at 1:02 o'clock P. M.

Returned to applicant:

Approved:

March 15, 1963

Recorded in book No. 9 of Ground Water Permits on page 2312

CHRIS L. WHEELER, STATE ENGINEER

Drainage Basin No. 7 page 52

State Printing

Permit A—4M—7-70

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Box 108, Milton-Freewater 97862, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Well No. 8

a tributary of Walla Walla River for the purpose of municipal

under Permit No. G-2312 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from December 13, 1962

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.90 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NW¼ SW¼, Section 18, T. 5 N., R. 36 E., W. M., 1620 feet North and 1170 feet East from SW Corner, Section 18.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to ---------- of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

W½
Section 1

N½
NE¼ SW¼
SE¼
Section 2

NE¼ NE¼
Section 11

W½ NE¼
NW¼
N½ SW¼
SE¼ SW¼
SE¼
Section 12
T. 5 N., R. 35 E., W. M.

NE¼ NE¼
Section 13
T. 5 N., R. 35 E., W. M.

SW¼ NW¼
NW¼ SW¼
Section 18
T. 5 N., R. 36 E., W. M.

SE¼ SW¼
SE¼
Section 35

SW¼ SW¼
Section 36
T. 6 N., R. 35 E., W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this date. October 24, 1974

Chris L. Wheeler
State Engineer

Recorded in State Record of Water Right Certificates, Volume 33, page 41011

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
JUN 4 1965
STATE ENGINEER
SALEM OREGON

UMAT 4010

#8

WATER WELL REPORT

STATE OF OREGON
(Please type or print)

State Well No. 5N/36-18 M

State Permit No. G-2317

App # G-2502

(1) OWNER:

Name CITY OF MILTON FREEWATER

Address MILTON FREEWATER, ORE.

(2) LOCATION OF WELL:

County UMATILLA Driller's well number 4189

SW ¼ SW ¼ Section 18 T. 5N R. 36E W.M.

Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):

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

If abandonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic [ ] Industrial [ ] Municipal [X]

Irrigation [ ] Test Well [ ] Other [ ]

(5) TYPE OF WELL:

Rotary [ ] Driven [ ]

Cable [X] Jetted [ ]

Dug [ ] Bored [ ]

(6) CASING INSTALLED:

Threaded [ ] Welded [ ]

24 " Diam. from 0 ft. to 315 ft. Gage .375

20 " Diam. from 0 ft. to 765 ft. Gage .375

16 " Diam. from 0 ft. to 480 ft. Gage .312

(7) PERFORATIONS:

Perforated? [ ] Yes [X] 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.

perforations from ft. to ft.

perforations from ft. to ft.

(8) SCREENS:

Well screen installed? [ ] Yes [X] No

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to ft.

Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Well seal—Material used in seal CEMENT GROUT

Depth of seal 0-78 ft. Was a packer used? NO

Diameter of well bore to bottom of seal 24 in.

Were any loose strata cemented off? [ ] Yes [X] No Depth

Was a drive shoe used? [X] Yes [ ] No

Was well gravel packed? [ ] Yes [X] No Size of gravel:

Gravel placed from ft. to ft.

Did any strata contain unusuable water? [X] Yes [ ] No

Type of water? SURFACE depth of strata 31 FEET

Method of sealing strata off CASING AND GROUT

(10) WATER LEVELS:

Static level 239 ft. below land surface Date NOV 1, 1963

Artesian pressure lbs. per square inch Date

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? [ ] Yes [ ] No If yes, by whom? R J STRASSER DRILLING CO

Yield: 1000 gal./min. with 67 ft. drawdown after 12 hrs.

" " " "

" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water 60° Was a chemical analysis made? [ ] Yes [X] No

(12) WELL LOG:

Diameter of well below casing 12" AND 10"

Depth drilled 888 ft. Depth of completed well 888 ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
SEE ATTACHED SHEET		

Work started FEB 21 1963 Completed APR 14 1965

Date well drilling machine moved off of well APR 15 1965

(13) PUMP:

Manufacturer's Name

Type: DEEP WELL TURBINE H.P.

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 J STRASSER DRILLING CO
(Person, firm or corporation) (Type or print)

Address 8110 SE SUNSET LANE PORTLAND ORE

Drilling Machine Operator's License No. 54

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

Contractor's License No. 10 Date JUNE 2, 1965

(USE ADDITIONAL SHEETS IF NECESSARY)

STATE ENGINEER
Salem, Oregon

Well #8

State Well No. 5N/36-18M
County Umatilla
Application No. G-2502

Well Log

Owner: City of Milton-Freewater Owner's No. #8

Driller: R. J. Strasser, Portland, Oregon Date Drilled April 14, 1965

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Fill	0	9	9
Gravel and boulders	9	31	22
Weathered rock	31	38	7
Medium hard black rock	38	47	9
Broken rock	47	50	3
Hard black basalt	50	81	31
Medium hard basalt	81	83	2
Hard black basalt	83	96	13
Broken black rock	96	105	9
Hard black basalt	105	112	7
Broken gray basalt	112	121	9
Porous black rock	121	144	23
Porous dark brown rock	144	163	19
Broken black rock	163	180	17
Medium hard gray basalt	180	201	21
Black and reddish brown rock	201	209	8
Porous black basalt	209	316	7
Hard gray basalt	316	341	25
Medium hard dark gray basalt	341	352	11
Hard gray basalt	352	358	6
Porous black basalt	358	386	28
Medium hard gray basalt	386	398	12
Medium soft black basalt	398	437	39
Medium hard gray basalt	437	447	10

STATE ENGINEER
Salem, Oregon

State Well No. 5N/36-18M
County Umatilla
Application No. G~~e~~2502

Well #8

Well Log

Owner: City of Milton-Freewater Owner's No. #8

Driller: R. J. Strasser, Portland, Oregon Date Drilled April 14, 1965

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Black basalt with layers of black clay	447	463	26
Medium hard gray basalt	463	566	103
Porous black basalt with black clay	566	613	47
Medium hard gray basalt	613	679	59
Medium hard black basalt	679	723	44
Medium hard gray basalt	723	779	56
Hard gray basalt	779	787	8
Medium hard gray basalt with black clay	787	811	24
Medium hard black basalt	811	825	14
Medium hard gray basalt	825	827	2
Hard gray basalt	827	830	3
Medium hard gray basalt	830	836	6
Black and red basalt	836	841	5
Broken porous black and brown basalt	841	864	23
Porous black basalt	864	869	5
Porous black and brown basalt	869	883	14
Medium soft black basalt	883	888	5

STATE ENGINEER
Salem, Oregon

State Well No. 5N/36-18M(1)

County UMATILLA

Well #8

Application No. _____

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO. #8

Description of measuring point: _____

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
3-19-64	239				
4-13	141.5				
6-15	193.5				
7-13	243				
8-24	245				
9-22	245.10				
10-26	245.40				
11-23	245				
12-24	245.50				

REMARKS: _____

State Printing 89314

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
MAR 18 1970
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 4005

Well #8

State Well No. 5N/36-18cb G-2502

State Permit No. G-2312

(1) OWNER:
Name CITY OF MILTON-FREEWATER ORE.
Address MILTON-FREEWATER ORE.

(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 ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐
SEE PREVIOUS LOG
" Diam. from ft. to ft. Gage
" 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.
perforations from ft. to ft.
perforations from ft. to 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) WATER LEVEL: Completed well.
Static level 269 ft. below land surface Date 2/24/70
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? CONTRACTOR
Yield: 1529 gal./min. with 197 ft. drawdown after 3½ hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 68 Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION: SEE PREVIOUS LOG
Well seal—Material used
Depth of seal ft.
Diameter of well bore to bottom of seal in.
Were any loose strata cemented off? ☐ Yes ☐ No Depth
Was a drive shoe used? ☐ Yes ☐ No
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.

(11) LOCATION OF WELL:
County UMATILA Driller's well number 8
NW¼ S.W.¼ Section 18 T. 5N R. 36 E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing 12X10
Depth drilled 1051 ft. Depth of completed well 1051 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.

MATERIAL	From	To	SWL
SEE PREVIOUS LOG	0	888	269
BLACK BASALT	888	963	269
BROWN-BLACK BASALT	963	965	269
BLACK BASALT	965	973	269
GREY BASALT	973	1021	269
RED BASALT	1021	1025	269
RED-BLACK BASALT	1025	1030	269
BLACK- BASALT	1030	1050	269
GREY- BASALT	1050	1051	269

Work started 12-1 1969 Completed 2-2 1970
Date well drilling machine moved off of well 2-2-70 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] (Drilling Machine Operator) Date 3-10, 1970
Drilling Machine Operator's License No. 361

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 CHARLES SUHRMANN DRILLING CO. (Person, firm or corporation) (Type or print)
Address 145 REES AVE. W.W. WASH
[Signed] (Water Well Contractor)
Contractor's License No. 230 Date 3-10-, 1970

(USE ADDITIONAL SHEETS IF NECESSARY)

Well #8

STATE OF OREGON

COUNTY OF UMATILLA

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF MILTON FREEWATER, DAVID BRADSHAW
722 S MAIN (541)938-5531
MILTON FREEWATER, OREGON 97862

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: G-14665

SOURCE OF WATER: WELL 8 IN WALLA WALLA RIVER BASIN

PURPOSE OR USE: FROST PROTECTION AND IRRIGATION OF 10.2 ACRES

MAXIMUM RATE: 0.128 CUBIC FOOT PER SECOND

PERIOD OF USE: MARCH 15 THROUGH MAY 10 FOR FROST PROTECTION AND JUNE 1 THROUGH SEPTEMBER 30 FOR IRRIGATION

DATE OF PRIORITY: JANUARY 15, 1998

POINT OF DIVERSION LOCATION: NW 1/4 SW 1/4, SECTION 18, T5N, R36E, W.M.; 1113 FEET SOUTH & 1101 FEET EAST FROM W1/4 CORNER, SECTION 18

The amount of water used for irrigation under this right, together with the amount secured under any other right existing for the same lands, is limited to a diversion of ONE-EIGHTIETH of one cubic foot per second (or its equivalent) and 3.0 acre-feet for each acre irrigated during the irrigation season of each year.

THE PLACE OF USE IS LOCATED AS FOLLOWS:

NW 1/4 SW 1/4 10.2 ACRES & FROST PROTECTION
SECTION 18
TOWNSHIP 5 NORTH, RANGE 36 EAST, W.M.

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

C. The Director may require the permittee to keep and maintain a record of the amount (volume) of water used and may require the permittee to report water use on a periodic schedule as established by the Director. In addition, the Director may require the permittee to report general water use information, the periods of water use and the place and nature of use of water under the permit. The Director may provide an opportunity for the permittee to submit alternative reporting procedures for review and approval.

If substantial interference with a senior water right occurs due to withdrawal of water from any well listed on this permit, then use of water from the well(s) shall be discontinued or reduced and/or the schedule of withdrawal shall be regulated until or unless the Department approves or implements an alternative administrative action to mitigate the interference. The Department encourages junior and senior appropriators to jointly develop plans to mitigate interferences.

This right is limited to any deficiency in the available supply of any prior right existing for the same land.

STANDARD CONDITIONS

The wells shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water shall be limited when it interferes with any prior surface or ground water rights.

The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

Actual construction of the well shall begin by September 30, 1999. Complete application of water to the use shall be made on or before October 1, 2002. Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE).

Issued September 30, 1998

Dwight Friend for

Martha O. Pagel, Director
Water Resources Department

Well No. 9

Permit A-k-IM-2-50 State Printing Dept. 37068

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* UMATILLA CANNING COMPANY

of 1000 Broadway, Hilton *, State of* Oregon *, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of* a well *a tributary of* Walla Walla River *for the purpose of* Cleaning, fluming, washing, blanching, cooking & cooling fruits and vegetables *under Permit No.* U-373 *of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from* December 22, 1950 ;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 2.23 cubic feet per second,

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW¼ SE¼, Section 12, Township 5 North, Range 35 East, W. M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to _ _ _ _ _ _ _ _ *of one cubic foot per second per acre,*

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

SW¼ SE¼
Section 12
NW¼ NE¼
Section 13
Township 5 North, Range 35 East, W. M.

Land on which water is to be used is a part of that more explicitly described by appropriator as follows:
All of Block 18 of Nichols Addition to the Town, now City, of Milton, by Deed Recorded in Book 169, Page 192 of Deed Records of Umatilla County, Oregon. Excepting that portion heretofore conveyed by Ephriam D. Hastings to Daniel E. Hastings, by Deed recorded in Book 62, Page 607 of the Deed Records of Umatilla County, Oregon. Also excepting that portion thereof heretofore conveyed to the State of Oregon by Deeds recorded in Book 160, Pages 70 and 71 of the said Deed Records. Excepting any and all water rights of way.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this 28th *day of* July *,19* 55 .

LEIF A. GRALEY
State Engineer

Recorded in State Record of Water Right Certificates, Volume 15 *, page* 20806.

STATE OF OREGON

COUNTY OF UMATILLA

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF MILTON-FREEWATER
PO BOX 6 (541) 938-5531
MILTON-FREEWATER, OREGON 97862

The specific limits for the use are listed below along with conditions of use.

APPLICATION FILE NUMBER: G-13494

SOURCE OF WATER: A WELL IN WALLA WALLA RIVER BASIN

PURPOSE OR USE: MUNICIPAL USE

RATE OF USE: 3.34 CUBIC FEET PER SECOND

PERIOD OF USE: YEAR ROUND

DATE OF PRIORITY: FEBRUARY 27, 1996

POINT OF DIVERSION LOCATION: SW 1/4 SE 1/4, SECTION 12, T5N, R35E, W.M.; 840 FEET NORTH AND 2020 FEET WEST FROM THE SE CORNER OF SECTION 12

THE PLACE OF USE IS LOCATED AS FOLLOWS:

SERVICE AREA OF THE CITY OF MILTON-FREEWATER

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

The water user shall develop a plan to monitor and report the impact of water use under this permit on water levels within the aquifer that provides water to the permitted well(s). The plan shall be submitted to the Department within one year of the date the permit is issued and shall be subject to the approval of the Department. At a minimum, the plan shall include a program to periodically measure static water levels within the permitted well(s) or an adequate substitute such as water levels in nearby wells. The plan shall also stipulate a reference water level against which any water-level declines will be compared. If a well listed on this permit (or replacement well) displays a total static water-level decline of 25 or more feet over any period of years, as compared to the reference level, then the water user shall discontinue use of, or reduce the rate or volume of withdrawal from, the well(s). Such action shall be taken until the water level recovers to above the 25-foot decline level or until the Department determines, based on the water user's and/or the Department's data and analysis, that no action is necessary because the aquifer in question can sustain the observed declines without adversely impacting the resource or senior water rights. The water user shall in no instance allow excessive decline, as defined in Commission rules, to occur within the aquifer as a result of use under this permit.

Within TWO YEARS of permit issuance, the permittee shall submit a water management and conservation plan consistent with Oregon Administrative Rules Chapter 690, Division 86.

If at any time the well or its use:

a) acts as a conduit for groundwater contamination,
b) allows loss of artisan pressure,
c) allows waste of groundwater,
d) interferes with senior groundwater users or
e) interferes with surface water sources,

the Department may require that the well be repaired in accordance with current well construction standards.

STANDARD CONDITIONS

The wells shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water shall be limited when it interferes with any prior surface or ground water rights.

The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

Actual construction of the well shall begin within one year from permit issuance and shall be completed on or before October 1, 1998. Complete application of the water to the use shall be made on or before October 1, 1999.

Issued July 8, 1996

for Martha O. Pagel / Director
Water Resources Department

Umat 51825

AUG 07 1998

WATER RESOURCES DEPT. SALEM, OREGON

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

Well #9 _____

(START CARD) # 092107

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

(1) OWNER: Well Number #9

Name City Milton-Freewater

Address P.O. Box 6 222 S. Main

City Milton-Freewater State Ore. Zip 97862

(2) TYPE OF WORK

☐ New Well ☐ Deepening ☒ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:

☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger

☐ Other Reverse Rotary

(4) PROPOSED USE:

☐ Domestic ☒ Community ☒ Industrial ☐ Irrigation

☐ Thermal ☐ Injection ☐ Livestock ☐ Other _____

(5) BORE HOLE CONSTRUCTION:

Special Construction approval ☐ Yes ☒ No Depth of Completed Well 870 ft.

Explosives used ☐ Yes ☒ No Type _____ Amount _____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
18"	+2	290	grout	+2	290	8 yds
Packer Set at 290' to 18" x 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
Liner Casing:	12"	+2	462	.375	☒	☐	☒	☐
	10"	462'	692	.365	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:

☒ Perforations Method Factory cut

☐ Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Telescope/Swage size	Casing	Liner
462'	692'	1/8 x 3	40/ft	10"		☐	☒
40 slots per foot						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
None	None		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 Umatilla Latitude _____ Longitude _____

Township 5 ☒ N or S Range 35 E or ☒ W WM.

Section 12 SW 1/4 SE 1/4

Tax Lot 1104 Lot _____ Block _____ Subdivision _____

Street Address of Well (or nearest address) Hwy 11

(10) STATIC WATER LEVEL:

292 ft. below land surface. Date 7-16-98

Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Estimated Flow Rate	SWL
No Drilling			

(12) WELL LOG:

Ground Elevation _____

Material	From	To	SWL
Did NO Drilling just installed liner in existing well.			

Date started 1-10-98 Completed 2-28-98

(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 1506

Signed _____ Date 8-5-98

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM, OREGON

Well #9

5N/35 - 12 0(1)

UMAT 3965

Application No. U -403
Permit No. U -373
Well No. 1, Umatilla Canning Co.
UMATILLA CO

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report August 22, 1951

1. Location of well: SW ¼ of SE ¼ of Section 12 Twp. 5N Rge. 35 E., W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: Approx. 4000 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: feet.
5. Date of beginning drilling or digging. January 11, 1951
6. Date well was completed ,June 22, 1951

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Yellow cement gravel	At surface 0 ft.	41 ft.
Broken Basalt & Blue Clay	41 ft.	285 ft.
Medium gray basalt & alternate clay & mud	285 ft.	421 ft.
Broken gray basalt	421 ft.	562 ft.
Black basalt & gray basalt	562 ft.	751 ft.
Medium black basalt - (2ft. Hard black basalt 816-818 ft)	751 ft.	878 ft.
Gray hard basalt	878 ft.	881 ft.
Medium black basalt	881 ft.	894 ft.
Hard black basalt	894 ft.	913 ft.
Remarks: Medium black basalt	913 ft.	918 ft.

WELL INFORMATION

8. Diameter of well see below inches. Depth of well 918 feet.
9. Depth at which water was first encountered 90 feet.
10. Water level when completed: 205 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Some caving - 321 ft to 500 ft.

8. 24" from 0 to 104 ft.
20" from 104 to 321 ft.
16" from 321 to 690 ft.
12" from 690 to 918 ft.

5N/35-12QA)
UMATILLA Co.

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM. OREGON

Well #9

PUMP INFORMATION

12. Manufacturer of pump: A. D. Cook, Inc.
13. Address: Lawrenceburg, Indiana
14. Data on name or base plate: Serial No. 13254
Cook Rotation Pump
15. Data on pump bowl assembly: TR 5107 12 TR 527
26 12 TR 5280
16. Size of pump: 8" Turbine
17. Rated capacity: 950 gallons per minute.
18. Rated speed: 1765 revolutions per minute.
19. Number of stages: 8
20. Size of intake pipe: 8"
21. Size of discharge pipe: 8"
22. Length of intake pipe: 290 feet column, 25 feet bowl assembly, suction and strainer
23. Length of discharge pipe: 161.65 ft.
24. Suction lift: (difference in elevation between water surface in well and pump) 205 feet
25. Discharge lift: (difference in elevation between pump and end of discharge line) Hardly any -- pipe runs slightly downhill
26. Depth of pump intake below ground surface: 310 feet.
27. Remarks: This pump will be exchanged or worked over to that we can pump between 1400 and 1500 g.p.m. next season.

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: General Electric
29. Address: Schenectady, N. Y.
30. Type of motor or engine: Electric Induction Motor
31. Data on name or base plate: Model 5K445A1A Service Factor 1.15 at Rated Volts 60 cycles 220/440 volts Type K Code F Frame 445 3 phase 60 cy FL AMP 181/90.5 FL Speed 1765 No. WGJ6873648 TRYCLAD INDUCTION MOTOR
32. Rated horsepower: 75 H.P.
33. Rated speed of motor or engine: 1765 revolutions per minute.
34. Rated Capacity of Pump (with described motor)

950	g.p.m. at	205	ft. head
800	g.p.m. at	300	ft. head
700	g.p.m. at	350	ft. head
	g.p.m. at		ft. head
	g.p.m. at		ft. head

35. Remarks: We intend to trade this pump and motor or have it worked over next year (before June 1952) so that we can pump 1400-1500 g.p.m.

5N/25-12CA

Well #9

CAPACITY TEST

36. Date of test: 8/16 & 8/17, 1951 37. Temperature of water 60 °F. or ____ °C.

38. Motor speed during test: From 1250 - 1800 R.P.M.

39. Test made by (weir, tank or other means): Weir

40. DIRECT READING GAUGE	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	▫Draw-down	+Time	
205	____lbs., Gauge at pump	Total 205 ft. ___ in.	Static water level	ft.	____ ft.	____ M.	8/16
215	____lbs., Gauge at pump	Total 215 ft. ___ in.	336	215 ft.	10 ft.	7:15 A.M.	
244	____lbs., Gauge at pump	Total 244 ft. ___ in.	795	244 ft.	39 ft.	8:30 A.M.	
266	____lbs., Gauge at pump	Total 266 ft. ___ in.	1220	266 ft.	61 ft.	10:30 A.M.	
287	____lbs., Gauge at pump	Total 287 ft. ___ in.	1407	287 ft.	82 ft.	12:30 P.M.	
287	____lbs., Gauge at pump	Total 287 ft. ___ in.	1407	287 ft.	82 ft.	5:30 P.M.	
270	____lbs., Gauge at pump	Total 270 ft. ___ in.	1220	270 ft.	65 ft.	7:30 P.M.	
285	____lbs., Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	9:00 P.M.	
285	____lbs., Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	12:00 M.	Midnight
285	____lbs., Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	4:00 A.M.	8/17
270	____lbs., Gauge at pump	Total 270 ft. ___ in.	1312	270 ft.	65 ft.	4:10 A.M.	
263	____lbs., Gauge at pump	Total 263 ft. ___ in.	1220	263 ft.	58 ft.	4:20 A.M.	
264	____lbs., Gauge at pump	Total 264 ft. ___ in.	1220	264 ft.	59 ft.	6:00 A.M.	
295	____lbs., Gauge at pump	Total 295 ft. ___ in.	1501	295 ft.	90 ft.	6:10 A.M.	
295	____lbs., Gauge at pump	Total 295 ft. ___ in.	1501	295 ft.	90 ft.	6:18 A.M.	
209	____lbs., Gauge at pump	Total ____ ft. ___ in.	(RECOVERY)	ft.	____ ft.	6:23 A.M.	
____	____lbs., Gauge at pump	Total ____ ft. ___ in.		ft.	____ ft.	____ M.	

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
▫ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 325 ft.

42. Water is discharged into: Main lines, Umatilla Canning Company Plant.

43. Was water lowered to pump intake by test? Yes - deliberately.

44. Remarks: Didn't have enough column on to go beyond 1501 G.P.M. on test. Had only 90 feet of column beyond static water level of 205 feet. Well recovered to static water level from 6:18 a.m. to 6:23 a.m. 8/17/51. Recovery rate of 5 minutes.

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand & Son Address: 115 Rees Avenue, Walla Walla, Washington

46. Pump and motor were installed by: Pump, Pipe, & Power Co., Portland, Oregon Address: ____

47. Capacity test was made by: A. A. Durand & Son, Walla Walla, Washington Address: ____

48. General remarks: ____

STATE ENGINEER
Salem, Oregon

UMAT 3908

OBSERVATION WELL

Well Record

Key Well

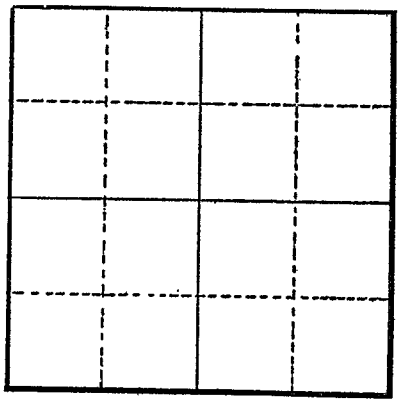
STATE WELL NO. 5N/35-1E(1)
COUNTY UMATILLA
APPLICATION NO. U-165

OWNER: KEY EQUIPMENT CO. (UTAH CAN) MAILING ADDRESS: MILTON FREEWATER

LOCATION OF WELL: Owner's No. #1 CITY AND STATE:

SW¼ NW¼ Sec. 1 T. 5 ~~S.~~ N., R. 35 ~~W.~~ E., W.M.

Bearing and distance from section or subdivision corner



Section 1

Altitude at well

TYPE OF WELL: DRILLED Date Constructed 2-16-45

Depth drilled 528' Depth cased 109'3"

CASING RECORD:

16 INCH

FINISH:

AQUIFERS:

BASALT

WATER LEVEL:

49' (2-16-45)

PUMPING EQUIPMENT: Type H.P.

Capacity G.P.M.

WELL TESTS: SEE PUMP TEST INFO

Drawdown ft. after hours G.P.M.

Drawdown ft. after hours G.P.M.

USE OF WATER MUNICIPAL Temp. °F., 19

SOURCE OF INFORMATION U-158

DRILLER or DIGGER A. A. DURAND & SON

ADDITIONAL DATA:

Log ✓ Water Level Measurements ✓ Chemical Analysis ✓ Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

UMAT 3908
Key Well

State Well No. 5N/35-1E(1)
County UMATILLA
Application No. U-165

Water Level Record

OWNER: KEY EQUIPMENT CO. (UTAH CANNING CO.) OWNER'S NO.

Description of measuring point: OWNERS AIRLINE & GAGE (197' LINE)

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
11-9-61	105'	RD & WSB.			
11-4-63	12[illegible]				
11-18	120				
12-2	120				
12-21	112				
1-6-64	112				
1-20	114				
2-3	113				
2-17	112				
3-3	107				
3-17	107				
4-7	105				
4-27	105				
5-4	103				
6-1	103				
9-29	132				
10-12	132				
11-16	130				

REMARKS:

State Printing 89314

UMAT 3908

Key Well

5N/35-7E 11

UMAT 3908

RECEIVED
MAR 5 1945
STATE ENGINEER
SALEM, OREGON

Application No. U-165
Permit No. U-158
Well No. 1

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Utah Canning Co.

Date of Report Feb. 28, ~~1951~~ 1945

1. Location of well: SW¼ of NW¼ of Section 1 Twp. 5N Rge. 35 E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1800 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: ------ feet.
5. Date of beginning drilling or digging Nov. 21, 1944
6. Date well was completed Feb. 16, 1945

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
	At surface	ft.
	ft.	ft.
	ft.	ft.
See attached Chronology of	ft.	ft.
Well.	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.

Remarks:

WELL INFORMATION

8. Diameter of well 16 inches. Depth of well 528 feet.
9. Depth at which water was first encountered 22 feet.
10. Water level when completed: 49 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.:

Note: You will find attached Test Pumping Record of this well.

The Utah Canning Company

By Geo. M. Martin

G-15 ENGINEERING DEPARTMENT DUPONT COMPUTATION SHEET SHEET No.

A. A. DURAND & SON
WELL DRILLING CONTRACTORS
215 Reese Avenue
WALLA WALLA, WASHINGTON

PROJ. No.
WORK
COMPUTED P.A.D. DATE March 7, 1945

Utah Canning Company, Freewater, Oregon.
Drilled during period November 21, 1944 to February 16, 1945

Plant Well No. 1
Located in SW¼ of NW¼ of Sec. 1, T4N, R35E

WELL CHRONOLOGY

Depth From	Depth To	Formation	S.W.L.	Comments
Ground Surface	20'	Gravel & boulders		
20'	30'	Gravel	22'	
30'	55'	Clay & Gravel		
55'	64'	Pure Gravel		
64'	92'	Yellow Clay & Gravel		
92'	107'	Solid Black Basalt		End of 20" Drilling.
107'	114'	Black Basalt & Blue shale		16" O.D. casing seated at 109' 3"
114'	118'	Black Basalt		
118'	125'	Gray & Brown Basalt and Blue Shale		
125'	145'	Gray Basalt & Blue Shale		
145'	155'	Gray, Red & Brown Basalt and Blue Shale	23'	
155'	158'	Gray & Brown Basalt with Blue Clay	23'	
158'	186'	Black Basalt		
186'	193'	Black & Red Basalt with little Yellow Clay		
193'	198'	Black Basalt		
198'	205'	Black Basalt & Blue Shale		
205'	213'	Black & Red Basalt with Yellow Clay		
213'	221'	Hard Black Basalt		
221'	228'	Black Basalt with little Yellow Clay		
228'	253'	Hard Black Basalt	15'	
253'	285'	Gray Basalt	16' 6"	
285'	292'	Hard Blue Basalt		
292'	401'	Hard Gray Basalt		
401'	437'	Hard Black Basalt		
437'	468'	Hard Gray Basalt		
468'	528'	Soft & Hard Black Basalt		

Pump Test #1 conducted Feb. 16 and 17, 1945, 24 hours continuous. S.W.L. 49'.

Mean Pumping Points as follows:

Dynamic W.L.	G.P.M.
70'	1029
75½'	1040
79½'	1265
81'	1550

Cement seal (150#) set at the bottom of 16" by bridging below 16" pipe, filling sam with cement and driving wood plug down an forcing cement around behind 16" casing. Was done when well wa drilled to 496' level Then cement & cement bridge drilled out at which time S.W.L. changed from 16' 6" to 41' 5"

Sketch not to Scale

G.S.

16" casing & Cement Seal @ 109' 3"

16" open hole From 109'-3" to 528'=418'-9"

Well Bottom 528'

UMAT 3908

Key Well

STATE ENGINEER
Salem, Oregon

State Well No. 5/35lE1

County Umatilla

Application No. .....

Chemical Analysis

OWNER Utah Canning Co. OWNER'S NO. .....

ANALYST Ore. State Board of Health Address .....

Date of Collection 1945

Point of Collection .....

	P.P.M.	E.P.M.
Silica (SiO_2)		
Iron (Fe) Total		
Manganese (Mn)		
Calcium (Ca)	16.	
Magnesium (Mg)	8.5	
Sodium (Na)	14.	
Potassium (K)		
Bicarbonate (HCO_3)	90.	
Carbonate (CO_3)		
Sulfate (SO_4)		
Chloride (Cl)		
Fluoride (F)		
Nitrate (NO_3)		
Boron (B)		
Dissolved Solids		
Hardness as $CaCO_3$	74.	
Specific Conductance (Micromhos at 25°C)		
pH		
Percent Sodium		
Sodium Absorption Ratio (S.A.R.)		
CLASS		

State Printing 89313

The Utah Canning Company

GENERAL OFFICE
OGDEN, UTAH

PLANTS AT
OGDEN, UTAH
FREEWATER, OREGON

Freewater, Oregon
May 24, 1950

RECEIVED
MAY 26 1950
STATE ENGINEER
SALEM, OREGON

Mr. Chas. E. Stricklin, State Engineer
State of Oregon,
Salem, Oregon

Dear Sir: Re: File No. 165

We are holder of Water Right Certificate No. 1551 under Permit No. U-158.

Due to the drop in water tables in this area last year we have been checking the water level in our well for depth below ground level weekly since Feb. 13, 1950 and find the following;

Feb. 13 -70'	Mar. 20 -65'	Apr. 17 -59'	May 15 -63
Feb. 27 -70	Mar. 27 -62	Apr. 24 -59	May 22 -65
Mar. 6 -68	Apr. 3 -62	May 1 -57'	
Mar. 13 -65	Apr. 10 -60	May 8 -57	

You will note that we had a build up for awhile and now the table is lowering.

When we started using our well in the 1949 season about June 10th the level was 59' below ground level and after pumping for 8 hours we had dropped somewhere below 100', how far below that we do not know as our gauge is only set for 100'.

It is very evident that there are too many wells on the same basin that we are on.

What we would like to know is, does a well that was proven at a certain time have priority over wells that were proven at later dates.

Very truly yours,

Utah Canning Company

Geo. M. Martin
Manager

5N/35-4E1
UMATILLA

Water level from ground surface. Utah Canning Company, Freewater, Oregon well - Permit No. U-~~165~~158

Date	Feet
Feb. 13, 1950	70 - Not Pumping
Feb. 27, 1950	70 - Not Pumping
March 6, 1950	68 - Not Pumping
March 13, 1950	65 - Not Pumping
March 20, 1950	65 - Not Pumping
March 27, 1950	62 - Not Pumping
April 3, 1950	62 - Not Pumping
April 10, 1950	60 - Not Pumping
April 17, 1950	59 - Not Pumping
April 24, 1950	59 - Not Pumping
May 1, 1950	57 - Not Pumping
May 8, 1950	57 - Not Pumping
May 15, 1950	63 - Not Pumping
May 16, 1950	63 - Not Pumping
May 17, 1950	63 - Not Pumping
May 22, 1950	65 - Not Pumping
May 31, 1950	70 - Not Pumping
June 5, 1950	70 - Not Pumping
June 12, 1950	74 - Not Pumping
June 13, 1950	73 - Not Pumping
June 14, 1950	75 - Not Pumping
June 15, 1950	73 - Not Pumping
June 16, 1950	73 - Not Pumping
June 19, 1950	73 - Not Pumping
June 20, 1950	74 - Started Pumping
June 21, 1950	95 - Pumping
June 22, 1950	93 - Pumping
June 23, 1950	93 - Pumping
June 24, 1950	94 - Pumping
June 25, 1950	98 - Pumping
June 26, 1950	100 - Pumping
June 27, 1950	100 - Pumping
June 28, 1950	98 - Pumping
June 29, 1950	99 - Pumping
June 30, 1950	103 - Pumping
July 1, 1950	100 - Pumping
July 2, 1950	103 - Pumping
July 3, 1950	105 - Pumping
July 4, 1950	107 - Pumping
July 5, 1950	109 - Pumping
July 6, 1950	106 - Pumping
July 7, 1950	110 - Pumping
July 8, 1950	103 - Pumping
July 9, 1950	105 - Pumping
July 10, 1950	105 - Pumping
July 11, 1950	102 - Pumping
July 12, 1950	103 - Pumping
July 13, 1950	110 - Pumping
July 14, 1950	110 - Pumping

5N/35-1E1
UMATILLA

Water level from ground surface. Utah Canning Company, Freewater, Oregon well - Permit No. U-~~165~~ 159

Date	Feet
July 15, 1950	105 - Pumping
July 16, 1950	103 - Pumping
July 17, 1950	103 - Pumping
July 18, 1950	100 - Stopped Pumping
July 19, 1950	105 - Not Pumping
July 20, 1950	100 - Not Pumping
July 21, 1950	98 - Not Pumping
July 24, 1950	95 - Not Pumping
July 25, 1950	88 - Not Pumping
July 26, 1950	88 - Not Pumping
July 27, 1950	87 - Not Pumping
Aug. 3, 1950	87 - Not Pumping
Aug. 9, 1950	85 - Not Pumping
Aug. 11, 1950	85 - Not Pumping
Aug. 14, 1950	84 - Not Pumping
Aug. 18, 1950	83 - Not Pumping
Aug. 22, 1950	82 - Not Pumping
Aug. 30, 1950	78 - Not Pumping
Sept. 7, 1950	78 - Not Pumping
Sept. 12, 1950	79 - Not Pumping
Sept. 20, 1950	80 - Not Pumping
Sept. 26, 1950	80 - Not Pumping
Oct. 2, 1950	76 - Not Pumping
Oct 12, 1950	73 - Not Pumping
Oct. 17, 1950	73 - Not Pumping
Oct. 24, 1950	72 - Not Pumping
Nov. 1, 1950	72 - Not Pumping
Nov. 8, 1950	72 - Not Pumping
Nov. 20, 1950	72 - Not Pumping
Nov. 27, 1950	71 - Not Pumping
Dec. 6, 1950	69 - Not Pumping
Dec. 11, 1950	68 - Not Pumping
Dec. 19, 1950	67 - Not Pumping
Dec. 26, 1950	66 - Not Pumping

5N/35-1E(1)
UMATILLA CO.

Water level from ground surface. Utah Canning Company, Milton-Freewater, Oregon well - PERMIT No. U-158, for the year 1951

Date	Feet	Date	Feet
1/2	66 - Not Pumping	7/12	107 - Pumping
1/8	66 - " "	7/13	102 "
1/16	66 " "	7/14	105 "
1/22	65 " "	7/15	103 - " (Last Day)
1/29	67 " "	7/18	92 Not Pumping
2/5	68 " "	7/25	89 " "
2/13	71 " "	7/31	87 " "
2/20	73 " "	8/8	85 " "
2/28	74 " "	8/15	83 " "
3/5	76 " "	8/23	83 " "
3/12	76 " "	8/31	82 " "
3/19	76 " "	9/7	80 " "
3/26	74 " "	9/14	78 " "
4/3	62 " "	9/21	78 " "
4/10	63 " "	9/28	77 " "
4/17	64 " "	10/5	75 " "
4/23	64 " "	10/11	77 " "
4/30	63 " "	10/18	75 " "
5/8	63 " "	10/22	75 " "
5/14	61 " "	10/30	75 " "
5/23	63 " "	11/9	74 " "
6/4/	64 - Started Pumping	11/16	74 " "
6/5	85 - Pumping	11/1[illegible]	74 " "
6/9	85 Not Pumping	11/29	75 " "
6/11	88 " "	12/3	75 " "
6/15	84 " "	12/10	75 " "
6/17	95 Pumping	12/17	74 " "
6/18	98 "	12/27	73 " "
6/19	100 "	12/31	73 " "
6/20	100 "		
6/21	100 "		
6/22	102 "		
6/23	100 "		
6/24	105 "		
6/25	102 "		
6/26	108 "		
6/27	105 "		
6/28	105 "		
6/29	105 "		
6/30	107 "		
7/1	107 "		
7/2	107 "		
7/3	105 "		
7/4	105 "		
7/5	107 "		
7/6	109 "		
7/7	101 "		
7/8	107 "		
7/9	107 "		
7/10	103 "		
7/11	109 "		

5N/35-1E(1)
UMATILLA CO

Water level from ground surface. Utah Canning Company, Milton-Freewater Oregon - Well #1 - Permit No. U-158, for the year 1953.

1953	Ft.		1953	Ft.	
1/8	74	Not Pumping	7/11	119	Pumping
1/15	75	" "	7/12	117	"
1/22	77	" "	7/13	116	"
1/26	77	" "	7/14	117	"
2/2	79	" "	7/15	117	"
2/16	78	" "	7/16	115	"
2/23	81	" "	7/17	118	"
3/2	83	" "	7/18	110	"
3/9	79	" "	7/20	111	"
3/16	79	" "	7/27	93	Not Pumping
3/23	78	" "	8/5	91	" "
3/30	78	" "	8/10	89	" "
4/6	78	" "	8/17	86	" "
4/27	73	" "	8/24	84	" "
5/4	73	" "	8/31	82	" "
5/11	77	" "	9/8	80	" "
5/18	81	" "	9/15	83	" "
5/25	83	" "	9/22	84	" "
6/2	76	" "	9/28	76	" "
6/8	74	" "	10/5	74	" "
6/15	78	" "	10/12	72	" "
6/22	83	" "	10/19	73	" "
6/30	110	Pumping	10/26	70	" "
7/1	115	"	11/2	69	" "
7/2	112	"	11/9	67	" "
7/3	115	"	11/16	71	" "
7/4	113	"	11/23	73	" "
7/5	114	"	11/30	78	" "
7/6	112	"	12/7	78	" "
7/7	114	"	12/14	80	" "
7/8	114	"	12/21	80	" "
7/9	114	"	12/28	81	" "
7/10	115	"			

5N/35-1EH1
Umatilla Co

Water level from ground surface. Utah Canning Company, Milton-Freewater Oregon - Well #1 - Permit No. U-158, for the year 1954.

1954	Ft.		1954	Ft.	
1/4	81	Not Pumping	7/9	112	Pumping
1/11	83	" "	7/10	112	"
1/18	83	" "	7/11	112	"
1/25	83	" "	7/12	112	"
2/1	84	" "	7/13	109	"
2/8	80	" "	7/14	113	"
2/15	77	" "	7/15	117	"
2/22	78	" "	7/16	114	"
3/1	76	" "	7/17	95	Not Pumping
3/8	76	" "	7/18	96	" "
3/15	76	" "	7/19	95	" "
3/22	76	" "	7/20	96	" "
3/29	75	" "	7/21	110	Pumping
4/5	75	" "	7/22	110	"
4/12	75	" "	7/23	114	"
4/19	78	" "	7/26	96	Not Pumping
4/26	74	" "	8/2	95	" "
5/3	74	" "	8/9	92	" "
5/10	73	" "	8/16	90	" "
5/17	73	" "	8/23	80	" "
5/24	73	" "	8/30	77	" "
6/1	73	" "	9/6	74	" "
6/7	68	" "	9/13	73	" "
6/14	67	" "	9/20	71	" "
6/21	69	" "	9/27	71	" "
6/24	74	Pumping	10/4	69	" "
6/25	101	"	10/11	67	" "
6/26	105	"	10/18	67	" "
6/27	107	"	10/25	66	" "
6/28	97	Not Pumping	11/1	67	" "
6/29	104	Pumping	11/8	68	" "
6/30	105	"	11/15	70	" "
7/1	97	Not Pumping	11/22	72	" "
7/3	108	Pumping	11/29	74	" "
7/4	108	"	12/6	75	" "
7/5	111	"	12/13	76	" "
7/6	110	"	12/20	73	" "
7/7	113	"	12/27	71	" "
7/8	112	"			

Walla Walla River

Court--1000--2-40

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That MILTON CITY, a Municipal Corporation, of Milton, State of Oregon, has a right to the use of the waters of Walla Walla River for the purpose of Domestic and Municipal

and that said right has been confirmed by decree of the Circuit Court of the State of Oregon for Umatilla County, and the said decree entered of record at Salem, in the Order Record of the STATE ENGINEER, in Volume 12, at page 9; that the priority of the right thereby confirmed dates from 1890;

that the amount of water to which such right is entitled, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 7.24 cubic feet per second.

A description of the lands irrigated under such right, and to which the water is appurtenant (or, if for other purposes, the place where such water is put to beneficial use), is as follows:

PLACE OF USE: Within the
boundaries of the
CITY OF MILTON, Oregon.

AND said right shall be subject to all other conditions and limitations contained in said decree.

The right to the use of the water for irrigation purposes is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 5th day of April, 1940.

CHAS. E. STRICKLIN
State Engineer.

Recorded in State Record of Water Right Certificates, Volume 11, page 12920

Appendix B

Site Visit Photographs

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Well #1 eastside

Well #1 inside looking west

Well #1 inside looking east

Well #1 southside

Well #5 southside

Little Walla Walla River at Well #5

Diversion at Little Walla Walla River

Diversion at Little Walla Walla River

Marie Dorion Park and well #8 looking south

Well #8 westside

Well #8 inside north end

Well #8 inside south end pump

Well #8 east side

Old Milton-Freewater powerplant

Well #9 northside

Well #9 inside looking east