



# MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

*Rely on us.*

TO: Commissioners Helgeson, Brown, Mital, Simpson and Carlson  
FROM: Mel Damewood, Chief Water Engineering and Operations Officer  
DATE: July 26, 2017  
SUBJECT: Water Reliability Initiative  
OBJECTIVE: General Direction

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## Issue

In order to optimize our implementation of the water utility's Water Reliability Initiative, changes to the implementation have been proposed. This memo presents alternatives for consideration and discussion at the August 1, 2017 Board Meeting and Staff requests direction on the path forward.

## Background

The term "Water Reliability Initiative" was proposed in 2012 as part of a communication program to build support for continued investment in the Water Capital Improvement Plan (CIP) and the Second Source Project along with their associated rate impacts. Over time the term was also used to represent the water utility's concurrent efforts with its Emergency Water Supply Program. The current status of each of these items is discussed below:

### *Water Capital Plan.*

- The Water CIP is mature and well developed. The capital plan is rooted in the 2015 Water Master Plan Update, and the master plan was heavily influenced by the goals outlined in the 2013 Oregon Resiliency Plan (ORP). The ORP is a statewide plan which has identified targets for recovery following the Cascadia Subduction Zone Earthquake. These are long term 50 year goals and include the following for the Willamette Valley:
  - Potable Water available at Source – 1-2 weeks at 80-90% operational.
  - Transmission and Reservoir Backbone Operational - 1 day at 80-90% operational.
  - Distribution System Operational – 1-2 weeks at 80-90% operational.
- Type 1 work in the CIP is geared towards rehabilitation and replacement of pipelines and critical smaller facilities throughout the system.
- Type 2 work is based on the recommendations included in the 2015 Water Master Plan and includes, per the ORP, strengthening the resilient spine or backbone of our system. Specifically the Type 2 work includes the replacement or rehabilitation of our large base level reservoirs over the next ten years. We will also be strengthening our transmission system with this work likely occurring over the next 15 years.

- Second Source project is the only Type 3 project for the Water Utility and was geared toward the first item noted in the ORP.
- During recent affordability efforts, the 2018 Water CIP Type 1 capital was reduced and Second Source Project was replaced with a placeholder for an enhanced Emergency Water Supply Program.

### *Emergency Water Supply Program*

- Current efforts based on 2012 EWEB's Emergency Water Supply Plan, below is a summary of the recommendations and actions taken as a result of this plan:
- Water Distribution Trailers:
  - Three trailers completed.
  - All three kept in ready to deploy mode at ROC with potable water running through them.
  - Each equipped with piping and facilities necessary to deliver water from 100 nozzles from either a delivered water or pressurized water system.
  - Each trailer also includes delivery pumps and a gas generator for power.
  - Recommended to have 6 trailers ultimately.
- Water Treatment Trailer
  - Treatment components have been purchased and are at ROC.
  - Trailer design complete.
  - Construction to start in 2017 Q3 and be completed in Q4.
  - Start-up and functional testing in Q1/Q2 2018
- Water Delivery
  - One 500 gallon and two 2,000 gallon blivets (a collapsible rubber bladder used to transport liquids) on site at ROC ready for deployment. Also have one hard shell tank on hand. All are designed to be placed in dump trucks for delivering water.
  - This is one of the most significant issues. How to deliver water from sources while using equipment and resources to repair the system.
- Distribution Sites
  - 14 potential sites have been identified. It is assumed that only a portion of these would be available following an event.
  - Located at various schools as well as other locations such as the fair grounds and several churches.
  - Traffic control plans have been completed at two high schools – Sheldon and South Eugene
  - Several MOUs have been drafted and signed between EWEB and the owners of the distribution sites.
  - See Attachment 1 for location of identified water distribution sites.

- Water Supply
  - Assumed to date water would be from a variety of sources:
    - New and hardened reservoirs (recall that most of our base level reservoirs will meet this criteria within ten years.
    - Portable treatment trailers
    - Operating treatment plants
    - Functional groundwater wells.

### *Second Source Project*

- Numerous updates have been provided to the Board on this project.
- Properties for intake and treatment plant project have been acquired.
- Preliminary design for intake and treatment plant near completion. Anticipate finalizing in next few months. Preliminary design is for new treatment plant which could provide up to 16 Million Gallons per Day (MGD) at a cost of approximately \$71 Million.
- All other activities related to design, permitting, and land use on hold.

### **Discussion**

With the water capital plan for Type 1 and Type 2 work mostly in place, the primary items for discussion are the Emergency Water Supply Program and the Second Source Project. These have been concurrent efforts by the Water Utility however there have been recent discussions regarding placing more emphasis on the Emergency Water Supply Program and deferring the Second Source Project. Both of these are discussed below following a discussion on the level of service provided by each.

### *Level of Service*

- The Level of Service is what differentiates the Emergency Water Supply Program from the Second Source Project.
- Emergency Water Supply Level of Service:
  - Water picked up in containers at locations distributed throughout the community.
  - No supply to business or industry which, if long term, would have a significant impact on the local economy.
  - No fire-fighting capacity is provided
  - Capacity required – Approximately 300,000 gallons per day which is based on two gallons per person per day
  - Portable distribution sites as well as permanent distribution sites supplied with private wells fall in this category.
- Second Source Level of Service:
  - Distribution system intact (i.e. status following a disruption affecting the Hayden Bridge source such as plant outage, spill in river, fire in watershed, etc.)
    - Water available at residential services

- Depending on capacity, water available to business and industry.
- Fire and emergency capacity available
- Distribution system compromised (i.e. potential status following Cascadia Subduction Zone Earthquake.)
  - Water supply to affected areas reverts to emergency only level of service.
- Capacity Required – Approximately 10 MGD to pressurize system and provide normal residential indoor use. Approximately 16 MGD to supply business and industry as well.
- The proposed Second Water Treatment Plant as well as regional solutions with sufficient capacity fall into this category.

### *Emergency Water Supply Program*

It has been proposed to enhance the current Emergency Water Supply Program with permanent distribution sites located at Schools, preferably at High Schools with existing irrigation wells that could be used as a source of water supply.

Having permanent sites with wells helps resolve one of the larger issues with the program which is how to get water to the distribution sites. Hauling water takes resources which could better utilized to make system repairs.

It is proposed that each site be configured as a joint water and electric facility supporting the Community Points of Distribution (CPOD). These CPODs were identified by the County as the locations where food, water, and other items would be distributed following a disaster. The locations of the CPODs were provided to FEMA and are shown at each High School in Attachment 1. With respect to water and electricity it is anticipated each site would have the following:

- An existing, new, or refurbished well.
- A water treatment system and associated equipment.
- A standby generator system
- A microgrid system to provide reliable standby power to both the water equipment and the CPOD facilities
- A building to house the above components as well as water dispensing piping and equipment.

Two of the high schools have existing wells already as shown in Table 1.

Table 1: Eugene School District 4j documented wells

Well location	Well ID	Depth (ft)	Yield (gpm)	Year Constructed
Sheldon High School	11264	120	300	1963
North Eugene High School	2046	142	450	1966
Bailey Hill and Lorane Highway	17320	102	20	1958
Gilham Elementary	57520	79	75	1999

A search of the water rights data also revealed pending water rights for wells at Howard Elementary (80gpm) and River Road Elementary (80gpm)

Advantages to an enhanced emergency program with permanent distribution sites at the High Schools include:

- High schools are logical gathering places in case of emergencies.
- Permanent sites allow for the storage of distribution equipment, minimizing the level of effort required for mobilization and startup.
- The wells may also serve as a supply for mobile distribution sites.

Disadvantages to the enhanced emergency program include:

- The well may not function after a seismic event.

The following are the anticipated next steps with respect to the program:

- Meet with representatives from 4J to:
  - Discuss the details of agreements which will be needed for use of 4J property and operation of the water and electric systems.
  - Confirm the locations of the sites. With only two of the High Schools having wells a decision will need to be made on whether it is feasible to drill new wells at those high schools without wells or move the sites to schools with wells. This should be a regional discussion with the County and others related to the location of the CPODs.
  - Inspect the potential distribution sites.
  - Agree on a priority list for the location of the facilities.
- Concurrently review options for use of the wells with respect to water rights. Limited Use Licenses may be required. This may be the case for both existing and new wells.

- Complete any well improvements that might be required.
- Develop plans for the permanent installations and construct the facilities.
- Concurrently further develop the portable distribution sites and trailers.

It is anticipated that the permanent installations would be constructed during the summer months when school is not in session.

### *Second Source Project*

Updates on the current Second Source project with a new robust treatment plant on the Willamette River have been provided at numerous Board Meetings over the last several years. In summary, this project provides for a new treatment plant that could provide up to approximately 16 MGD in case EWEB loses its McKenzie River source. The estimated cost for this project based on preliminary design is \$71 million.

Alternatives to the proposed project that could still provide a similar level of service include:

- A Regional Solution with the Springfield Utility Board (SUB). A regional solution could take many forms and may or may not include EWEB constructing a treatment plant. This solution will require the commitment of both Utilities for it to succeed.
- If a regional solution is not implemented, there is the potential to build a scaled back new treatment plant. It has been estimated that a reduced scale emergency only plant could be constructed for approximately \$42 Million. This plant would have no taste and odor treatment nor redundancy in its processes and equipment. The design would be for short term operation only. Monthly operational testing would likely be required to ensure the processes work. The configuration would be such that it could eventually be expanded to the currently proposed robust plant with minimal lost investment.

### *Other Items for Consideration*

- Anticipated Damage from the Cascadia Subduction Zone Earthquake (CSZE).  
There is a lot of speculation on the amount of damage our distribution system will see following the CSZE with much of it assuming total system failure. However, this is not anticipated and water system damage is expected to be primarily concentrated in areas where the soil shifts or settles due to liquefaction or landslide. In stark comparison to the Portland area, a sizable portion of the Eugene area is anticipated to see little to no soil instability. An updated map showing the areas with zero anticipated ground movement is included in Attachment 2. Approximately 55% of EWEB's water distribution system is outside the areas of possible ground deformation and landslides. As shown, the overall probability of liquefaction within the shaded area is less than 5%.

Based on this data, it is anticipated that much of the distribution will remain intact. There will however be some failures within the system, and their nature and severity is difficult to predict. EWEB has updated its design and construction standards and for the past several years has been installing ductile iron pipe with lock tight joints. This standard will increase pipe performance and integrity of the distribution system over time.

- **Willamette Surface Water Rights**

The Board has heard from EWEB staff as well as Springfield Utility Board staff in the recent joint meeting regarding the importance of maintaining water rights. Water rights can be very complex. At the proposed Willamette River intake location EWEB has:

- Surface Water Registration SWR-354. A Surface Water Registration is a claim of an existing right to use water that was established before Oregon passed its 1909 water code. Prior to 1909 there wasn't a system to apply to the state for a water right. Surface water registrations are intended to document those pre-existing water uses. The priority date of SWR-354 will ultimately be decided upon by the Oregon Water Resources Department in a lengthy process called "adjudication" which will likely take decades.
  - Permit S-54805. EWEB applied for this permit to address any uncertainty in SWR-354. It has the same capacity but a priority date of 2011 and a development deadline of 2033. Prior to 2033, completion of construction needs to occur for the use of water under this permit.
- **Confluence Well Field.** In the late 90's and early 2000's EWEB made plans for a well field in confluence area of the McKenzie and Willamette Rivers located in North Eugene. A total of 12 wells were originally anticipated and two were drilled. These are not equipped with any pumping equipment. Following testing of the drilled wells, interference was documented with neighboring wells including those of the Springfield Utility Board and the Rainbow Water District (RWD). While the original plan was for 12 MGD of supply, these interferences resulted in numerous restrictions being placed on the water right which limit the amount that can be pumped.

With these restrictions in place, EWEB focused once again on developing surface water supplies which ultimately led to the current Second Source Project. The drilled wells may have more value in regional discussions with SUB and RWD. They could possibly use the drilled wells to enhance their regional groundwater portfolio as part of some agreements related to surface water.

## **Recommendation**

None.

## **Requested Board Action**

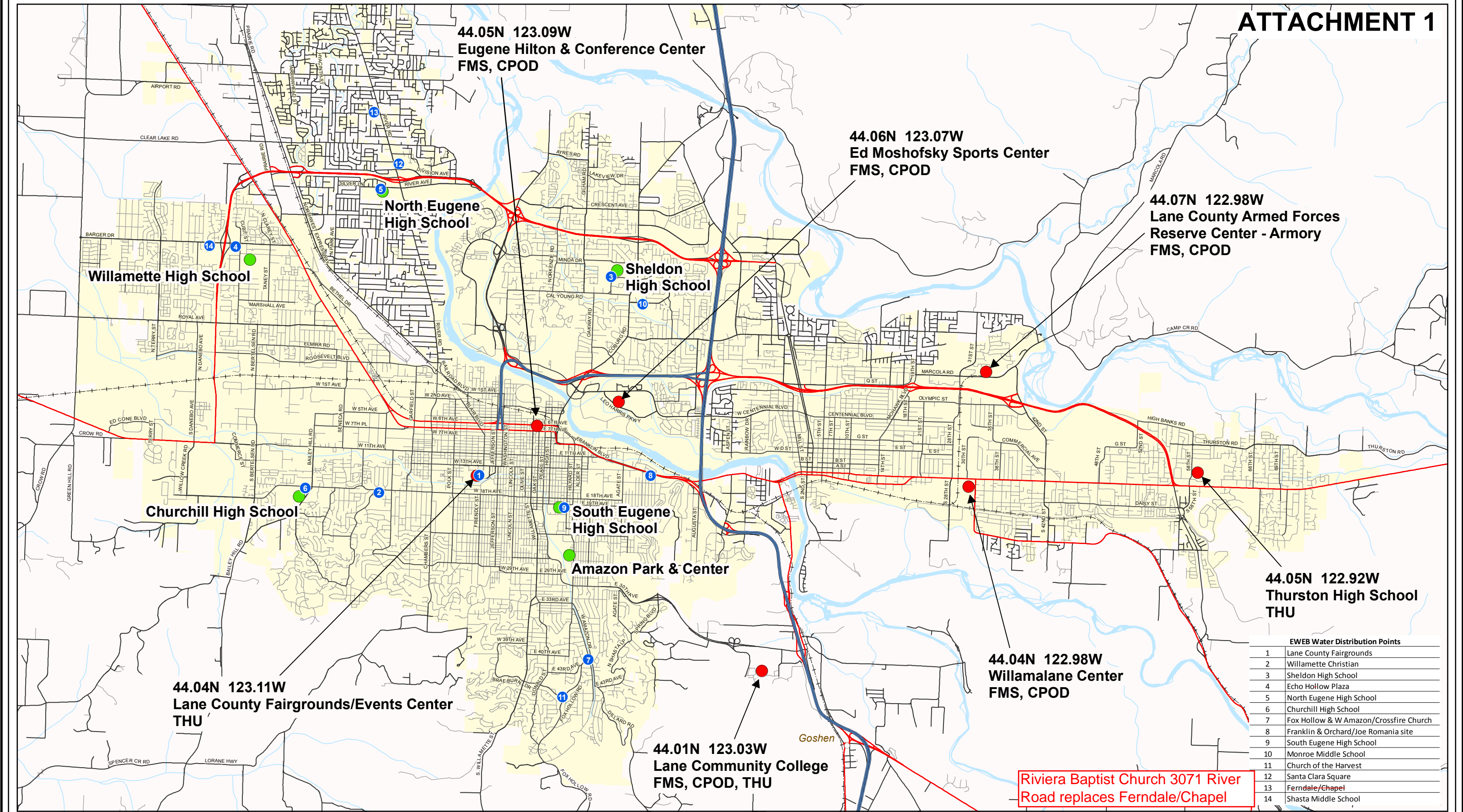
Input is sought from the Board on the items presented herein. Specifically, answers to the following questions are sought:

- 1) Should the water utility proceed with the "Enhanced Emergency Water Supply Plan" with permanent distribution sites as described herein as well as continuing to develop its portable distribution capabilities?
- 2) Does the Board agree that in the future, the Water Utility should have both an Emergency Water Supply Program as well as a Second Source?
- 3) Does the Board agree that the order of priority for developing a second source of supply for the water utility is:
  - a. First priority – Regional approach with Springfield Utility Board.
  - b. Second approach – EWEB develops its own second source on the Willamette River.
- 4) If the regional approach is unsuccessful, how long should EWEB wait to build its own 2<sup>nd</sup> Source of Supply?

Staff will be available to answer questions at the August 1, 2017 Board meeting.

If you have any questions please contact Mel Damewood, Chief Water Engineering and Operations Officer at 541-685-7145 or email [mel.damewood@eweb.org](mailto:mel.damewood@eweb.org).

ATTACHMENT 1



EWEB Water Distribution Points	
1	Lane County Fairgrounds
2	Willamette Christian
3	Sheldon High School
4	Echo Hollow Plaza
5	North Eugene High School
6	Churchill High School
7	Fox Hollow & W Amazon/Crossfire Church
8	Franklin & Orchard/Joe Romania site
9	South Eugene High School
10	Monroe Middle School
11	Church of the Harvest
12	Santa Clara Square
13	Ferndale/Chapel
14	Shasta Middle School

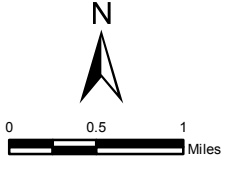
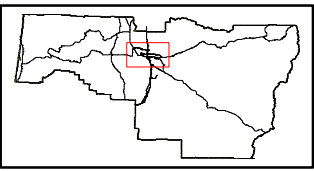
The information on this map was derived from digital databases on the Lane County regional geographic information system. Care was taken in the creation of this map, but is provided "as is". Lane County cannot accept any responsibility for errors, omissions or positional accuracy in the digital data or the underlying records. Current plan designation, zoning, etc., for specific parcels should be confirmed with the appropriate agency. There are no warranties, expressed or implied, accompanying this product. However, notification of any errors will be appreciated.

Federal Disaster Assistance Locations

- Facilities
- FMS = Federal Medical Station  
CPOD = Community Point of Distribution  
THU = Temporary Housing Unit Staging Area

- EWEB Water Distribution Points  
● Community Points of Distribution  
— Interstate Freeway  
— State Highway  
— County Road

- City Collector/Arterial  
— Railroad  
— River / Stream  
— County Boundary  
— Water Features  
— City Limits



Federal Disaster Assistance Locations  
Eugene/Springfield Metro Area

Lane County, Oregon

Drawn By:  
LCPWGRL




Date:  
12/5/2012

Revised:  
12/5/2012






Riviera Baptist Church 3071 River Road replaces Ferndale/Chapel

# Attachment 2: Potential Seismic Hazard Map

## Potential Hazard Areas

-  Liquefaction (0-5% Possibility)
-  Liquefaction & Landslide
-  Landslide

## Pump Pressure Mains

-  Transmission Mains
-  Distribution Mains
-  EWEB Water Service Area
-  Water
-  Streets



7/20/2017

