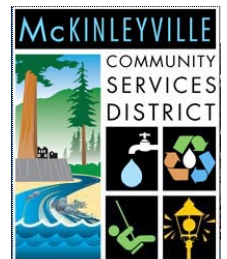


# McKinleyville Community Services District



## Wastewater Facilities Plan Response to Comments

Presented By:  
Lisa Stromme, P.E. and  
Mike Veach, P.E.  
January 4, 2012



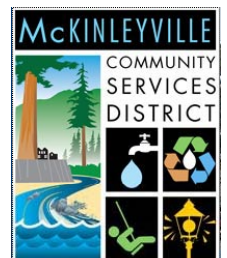
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## Introduction

The 20-Year Facilities Plan for the MCSD Wastewater Management Facility (WWMF) identifies recommended alternatives for upgrading the existing collection, treatment, reclamation, and disposal systems to meet current and future regulatory requirements as well as address projected growth needs in the community.

Board acceptance of the Facilities Plan is needed prior to submission of the plan to the Regional Board.

Tonight we are presenting the response to comments received on the Administrative Draft of the 20-Year Facilities Plan.



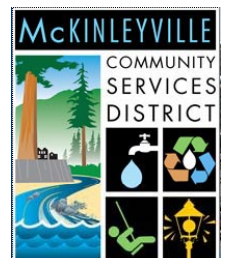
## Presentation Overview

**The goal of tonight's presentation is to:**

- Review the comments received and considered during the public comment period.

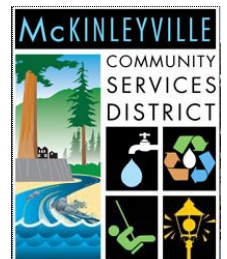
**The objective of tonight's presentation is to:**

- Present the response to comments on the Administrative Draft of the 20-year Facilities Plan.



## Presentation Outline

1. Facilities Plan Review Process
2. Facilities Plan Objective
3. Facilities Plan Conclusions
4. Overview of the Recommended Alternatives
5. General Comments from October Presentation
6. Discussion Points from November Workshop
7. Review and Consideration of Additional Comments
8. Overview of Additional Key Issues
9. General Response to Comments

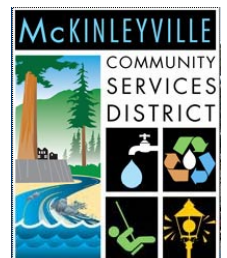


## Facilities Plan Review Process

The Administrative Draft of the Facilities Plan for the MCSD WWMF was presented to the MCSD Board on October 19, 2011.

The document was made available for public review during the public comment period from October 19, 2011 through December 14, 2011.

A public workshop was also held on November 7, 2011 for the public to ask questions and provide comments.

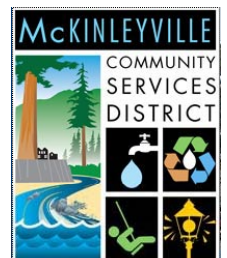


## **Facilities Plan Review Process, cont.**

On November 16, 2011 an update on the Facilities Plan was presented to the Board.

The presentation included a detailed review of the recommended alternative (an in-basin extended aeration system) for the treatment system upgrade.

On December 14, 2011 a tour of the City of Willits in-basin extended aeration facility was hosted for MCSD staff and Board members, and interested community members.



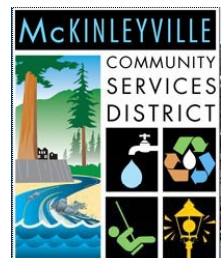
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## Facilities Plan Objective

Provide a clear, feasible, and appropriate “road map” to capital improvements, upgrades, and maintenance of the District’s wastewater collection, treatment, reclamation and disposal facilities.

The plan is designed to be used in the development of a wastewater management system that:

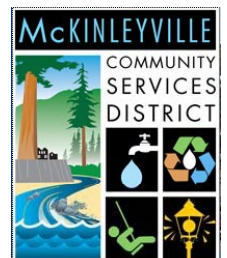
1. addresses immediate permit requirements,
2. anticipates future permit and regulatory requirements,
3. accommodates anticipated growth and community needs, and
4. provides flexibility for future expansion.



## Facilities Plan Conclusions

Of the treatment system alternatives reviewed, the in-basin extended aeration system provides a high quality effluent that would reliably meet anticipated permit requirements for land application and discharge to Mad River.

The treatment system upgrade, coupled with improvements to the existing land reclamation practices, should enable the WWMF to consistently meet or exceed regulatory requirements over the 20-year planning horizon.





## Overview of the Recommended Alternatives

### Collection System Upgrades (\$3.4M)

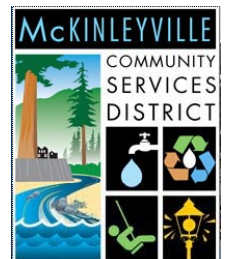
- Upgrade collection system network and system lift stations to handle projected flows.

### Treatment System Upgrades (\$8.5M)

- Install new headworks.
- Convert existing pond process into an in-basin extended aeration system.

### Reclamation/Disposal System Upgrades (\$1.9M)

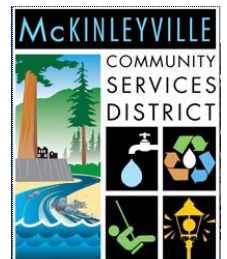
- Decommission existing percolation ponds.
- Install poplar forest for reclamation.



## General Comments from October Presentation

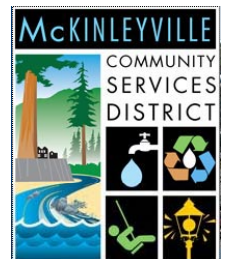
The following general comments on the plan were noted during the October presentation to the Board:

1. Incorporation of Public Input from 2010
  - Wetlands Treatment (Addressed in Section 7.2)
  - Municipal Reuse (Addressed in Section 8.3)
  - Ocean Outfall (Addressed in Section 8.4)
  - Modular System (Regulatory vs. Capacity Driven)
2. Selection of Designated Growth Rate
3. Pilot Project Results for Poplar Study
4. Odor Concerns for Selected Alternative



## Discussion Points Raised by the Public at the November 7<sup>th</sup> Workshop

- Why not deep well injection for disposal?
- What are the results of the Submerged Aquatic Vegetation study?
- What would comprise a minimum project?
- Are the community growth rate projections verifiable?
- What irrigation methods are being considered?
- What are the O&M costs?
- Are energy conservation measures being considered?
- Is a decentralized system acceptable by code?
- How will biosolids be handled?
- Are the impacts of future regulatory requirements addressed?
- Are different disinfection methods being considered?

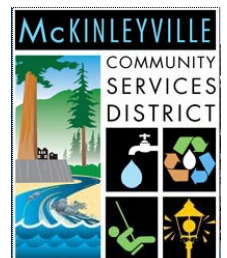


## Review and Consideration of Additional Comments

The facilities plan sets forth recommended alternatives for upgrading the existing WWMF collection, treatment, reclamation and disposal systems.

Based on review and consideration of the comments received to date, the recommended alternatives as set forth in the plan have not been changed.

However key issues were raised during the comment period that warrant further discussion and the Facilities Plan is being updated to address these issues.



# Overview of Additional Key Issues Raised

## Treatment Technology

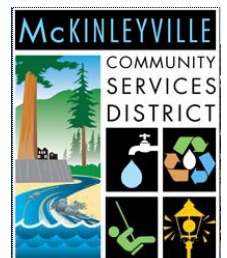
- Disinfection-by-Products
- Impacts of Low Alkalinity
- Treatment Pond Lining Requirements
- Integral Clarifier RAS Control Issues
- Alternative Treatment Technologies

## Disposal Concepts

- Alternative Disposal Methods
- Poplar Forest Expansion Options
- Percolation Pond Options

## Alternative Energy Sources

## In-basin Extended Aeration Facility Locations



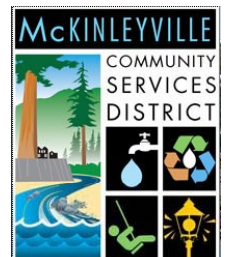
## Disinfection-By-Products

### Chlorine Disinfection-By-Products:

- Chloroform (No Criteria)
- Bromoform (Limit = 4.3 ug/L)
- Chlorodibromomethane (Limit = 0.4 ug/L)
- Bromodichloromethane (Limit = 0.6 ug/L)

### MCSD Effluent Concentrations (2008-2011):

- Chloroform (Max = 3.4 ug/L)
- Bromoform (ND = <0.1 ug/L)
- Chlorodibromomethane (ND = <0.08 ug/L)
- Bromodichloromethane (Max = 0.4 ug/L)



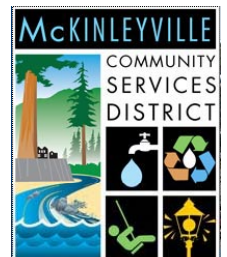
## Impacts of Low Alkalinity

### General Wastewater Characteristics for McKinleyville

- Average Alkalinity = 220 mg/L CaCO<sub>3</sub>
- Nitrification/Denitrification process will alter levels
- Anticipated effluent = 85 to 100 mg/L CaCO<sub>3</sub>
- Considered adequate to maintain required pH levels

### Consideration of Impacts

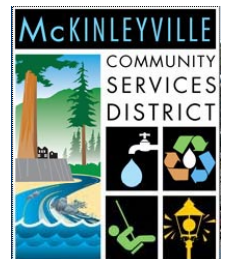
- Colder weather could drop alkalinity levels below those needed to maintain minimum pH
- Need to provide a means for increasing alkalinity during the design process
- Include caustic soda drip or addition of lime
- Anticipate minimal additional cost



# Treatment Pond Lining Requirements

## Title 27 Secondary Containment Requirements

- Municipal wastewater is classified as a “designated waste” (Water Code Section 13173/Title 27 Section 20220)
- Unless exempted, wastewater surface impoundments must be designed in accordance with Title 27 requirements for a Class II waste management unit.
- These requirements include provisions for liners that meet a prescriptive standard or for an engineered alternative that provides equivalent protection.
- Prescriptive standards include double liners and leachate collection and removal systems.
- Engineered alternatives and/or qualifications for exemptions will require detailed analyses of site geology and groundwater quality.

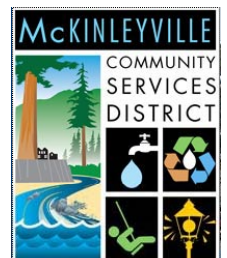




# Integral Clarifier RAS Control Issues

## In-basin Clarifiers vs. Conventional Clarifiers

- RAS = Return Activated Sludge
- Concern over operating problems with integral or in-basin clarifiers.
- Can also modify RAS pumps to eliminate the issues associated with RAS control in integral clarifiers.
- Use external RAS pumps for improved RAS control.
- Recommend modification of pumps or consideration of conventional clarifiers.
- Investigate use of conventional circular clarifiers as a desired upgrade during the final design process.



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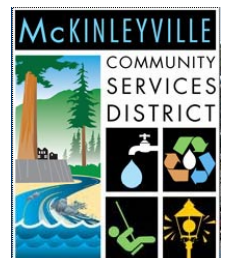
## Alternative Treatment Technologies

### Suspended Aeration with Clarification

- Include suspended growth or fixed film media in Pond 2, add recycle pumps to return flows.
- Requires screens/media and additional aeration.
- Preliminary review of similar alternative indicated this solution would not be cost effective.

### Microbial Seeding with Algae Control

- Biological nutrient removal through microbial seeding in “nursery tank”.
- Interesting alternative, but rather new process.
- Need proposed alternative to be proven and reliable.
- Question whether this technology has the ability to meet this criteria.



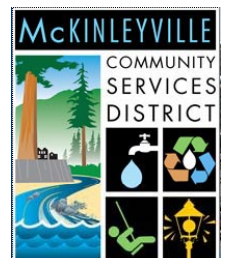
## Alternative Disposal Method - Deep Well Injection

### Two Options for Deep Well Injection:

- Injection into an aquifer (groundwater).
- Injection into a pervious layer isolated from an aquifer.

### Deep Well Injection Issues:

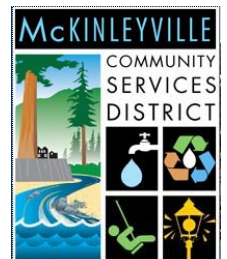
- Discharge directly to groundwater would require additional treatment.
- Installation and maintenance of injections wells can be problematic in seismically-active areas.
- Suspended solids loading constraints on injection system may require higher level of treatment.
- Well drilling costs may be excessive: exploratory borings, need for redundant wells, etc.



# Poplar Forest Options

## Poplar Forest Expansion Options

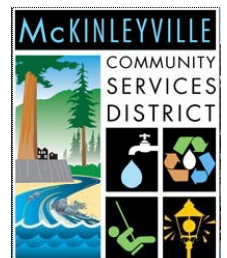
- The facilities plan includes costs for construction of a 45-acre poplar forest at the existing land reclamation sites.
- The minimum required acreage (45-acres) was estimated based on anticipated hydraulic loading rates following decommissioning of the percolation ponds.
- Expansion of the poplar forest beyond the minimum required acreage is another option for consideration at the land reclamation sites.
- The current pilot study will provide the required data for the development of the poplar forest.
- Expansion of additional potential reclamation areas will also be considered during the design process.



## Percolation Pond Options

### Percolation Pond Options

- The facilities plan includes costs for decommissioning and abandonment of the existing percolation ponds.
- The California Department of Fish and Game has expressed interest in an alternative use for the percolation ponds as potential fish-rearing facilities.
- This alternative use for the percolation ponds should be considered and investigated during the pre-design process.



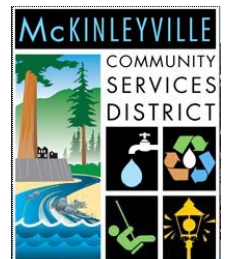
## Alternative Energy Sources

### Alternative Energy Sources for Treatment System:

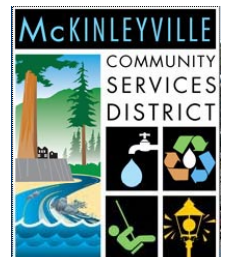
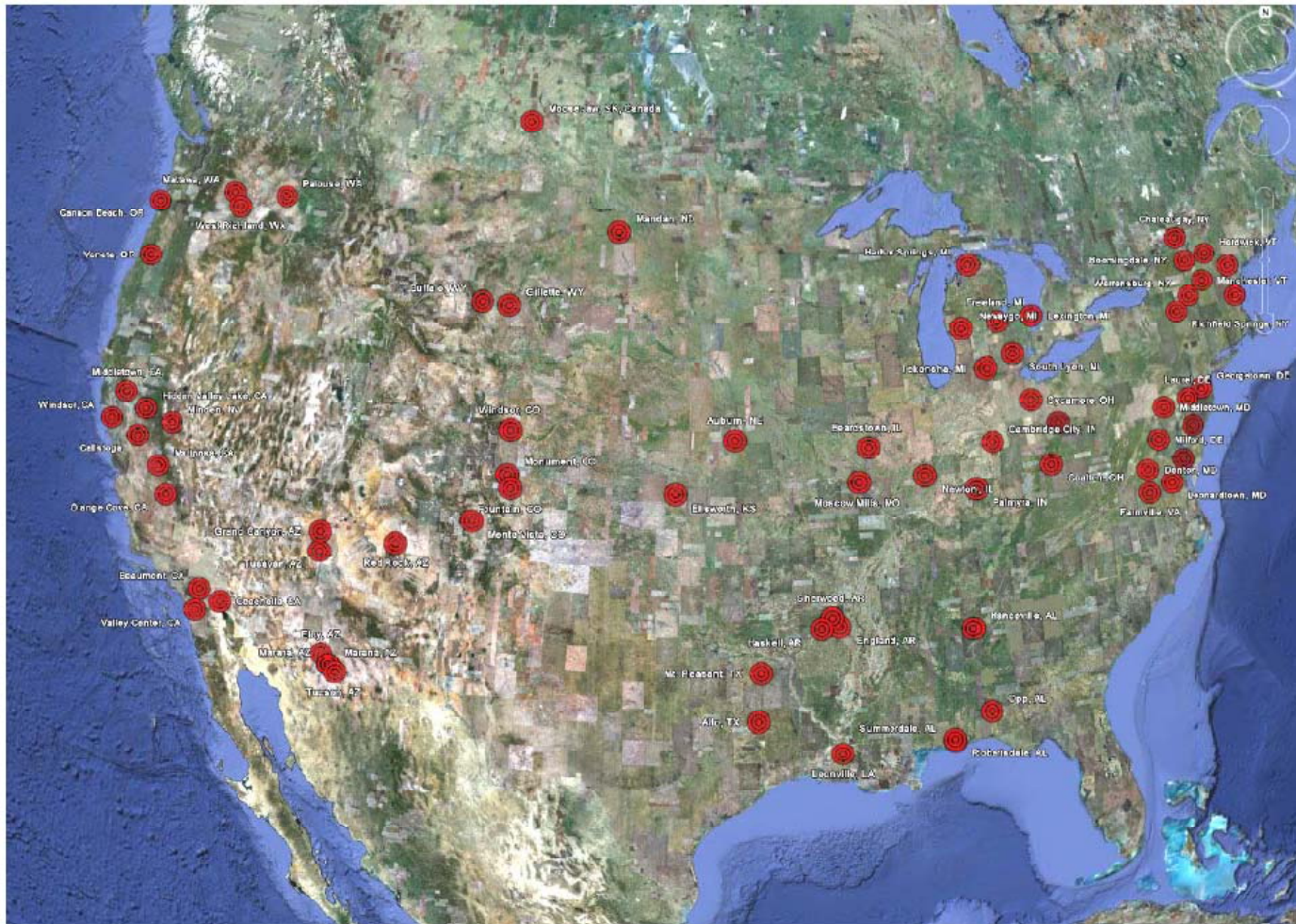
- Solar – installation of a solar array that will provide the energy needed to power the recommended treatment system has an estimated payback period of 40+ years based on current rates.
- Wind – preliminary research indicates the project area does not have consistent wind patterns at speeds sufficient for harvesting.

### Alternative Energy Production from Sludge Process:

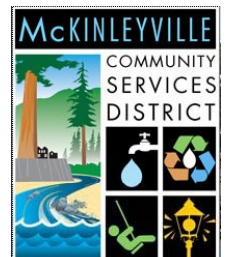
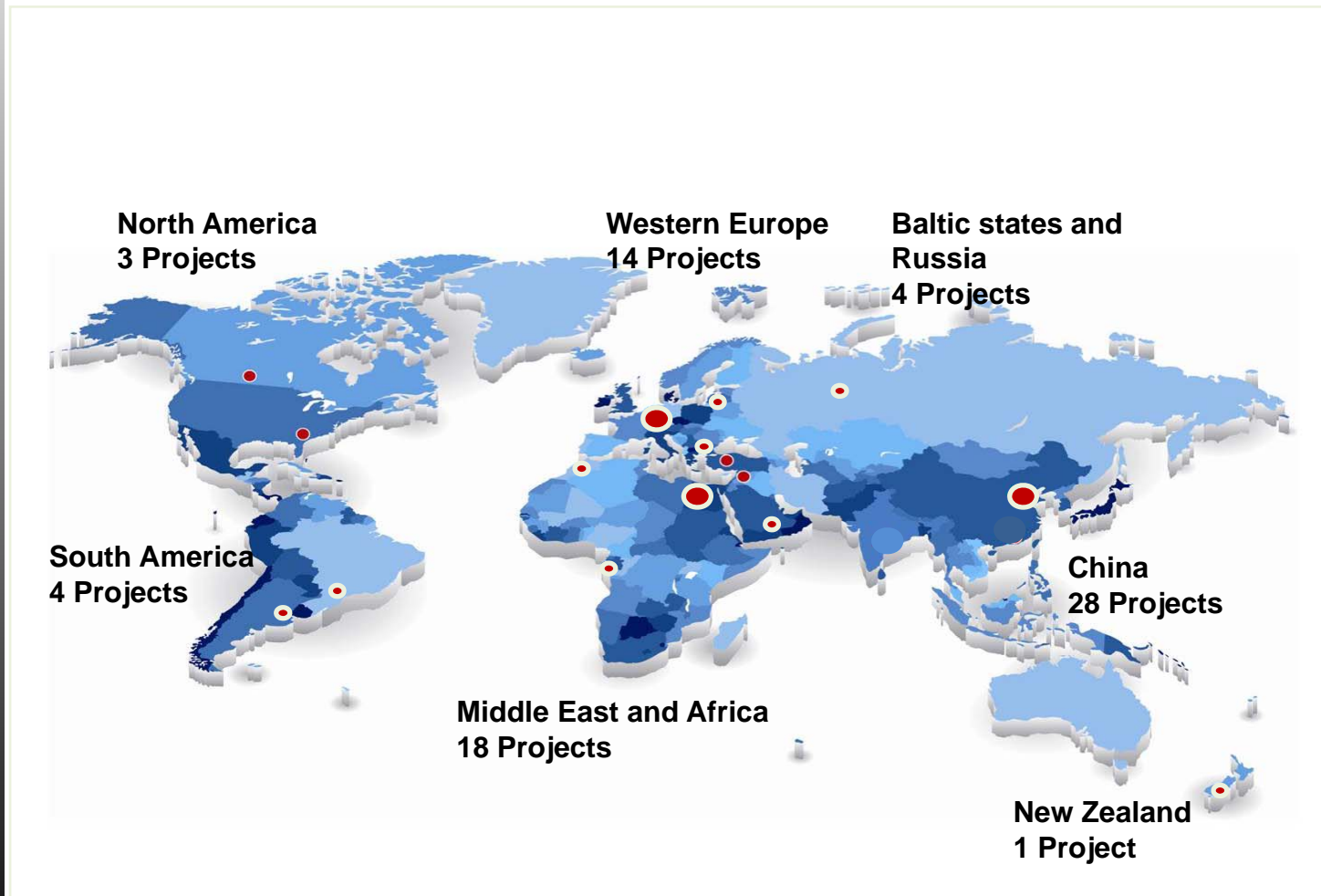
- Methane – installation of a cost effective methane capture and reuse system would require a larger volume of sludge production than MCSD is anticipated to generate.



# In-Basin Extended Aeration Facilities - Parkson Biolac Process Locations



# In-Basin Extended Aeration Facilities – Bioworks Process Locations





# Thank You!

## SHN Project Team:

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