



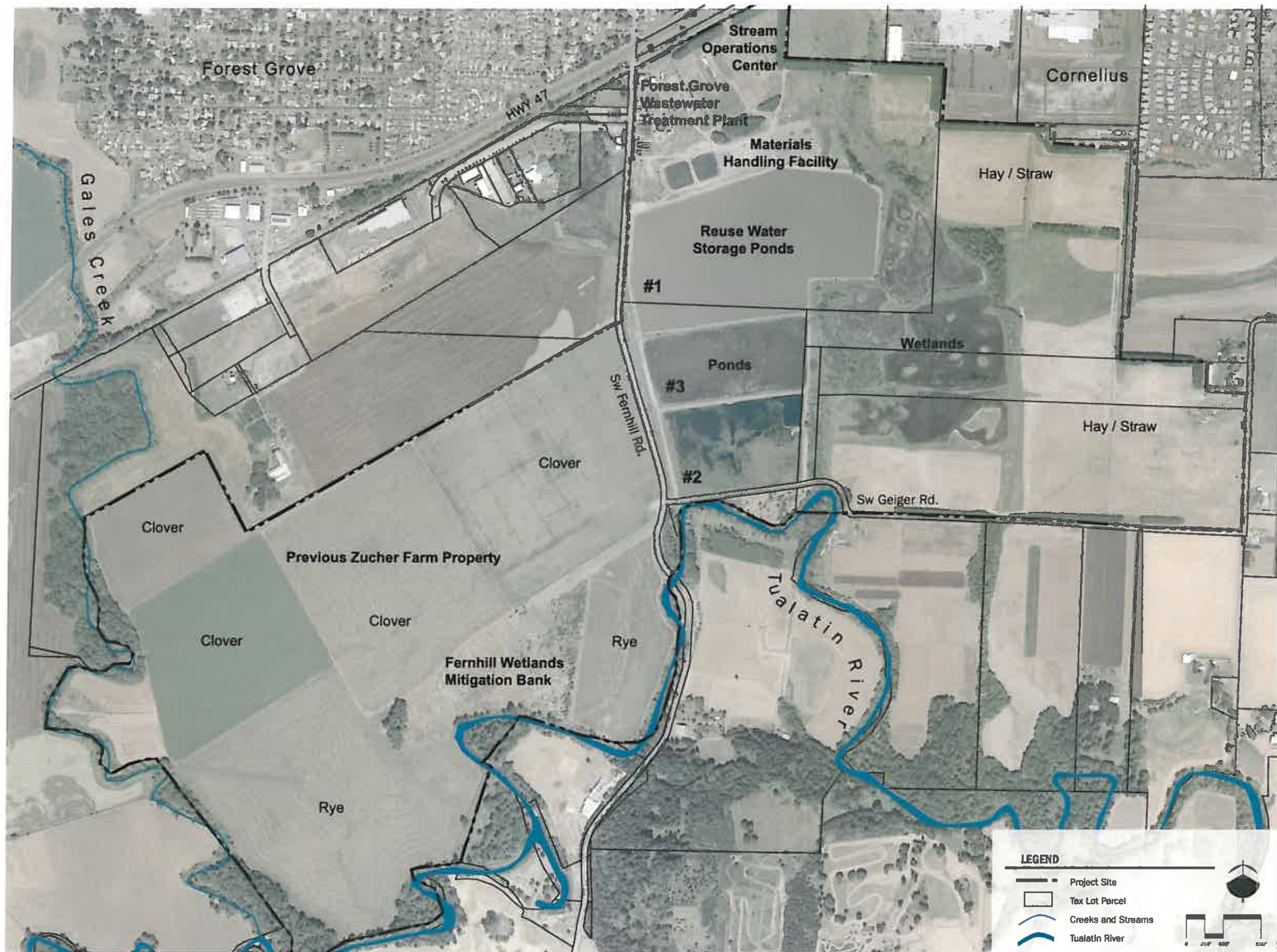
Clean Water Services

Forest Grove/ Fernhill Property Master Plan

March 5, 2008

GREENWORKS





EXISTING CONDITIONS













The study area for this design document includes 748 acres held by Clean Water Services in Forest Grove, Oregon. The site is between Highway 47 and the Tualatin River. Gales Creek is the easternmost boundary, and SW Fernhill Road divides the site in half. The master plan incorporates a variety of existing land use areas into a comprehensive long term vision for the property. These existing properties include:

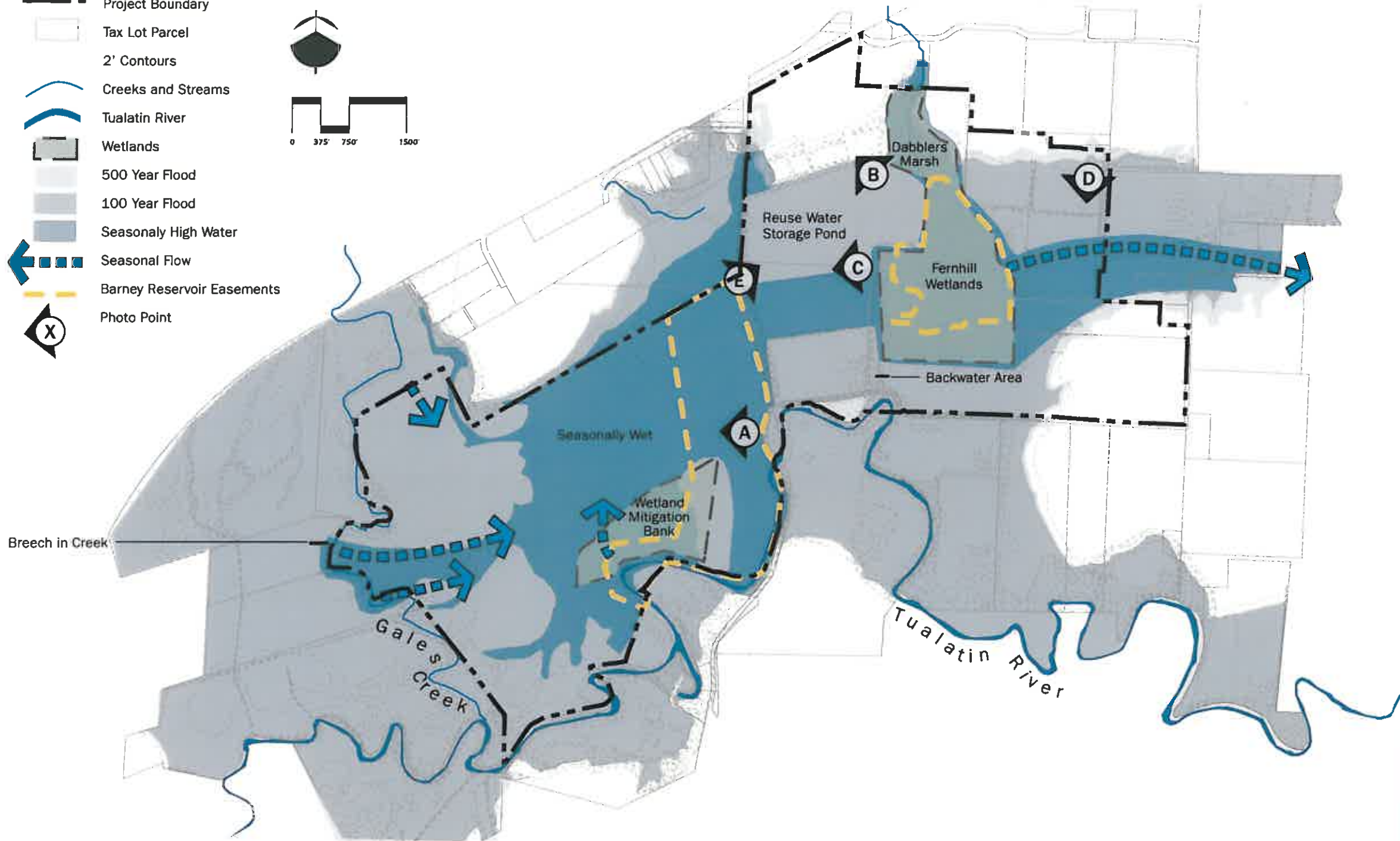
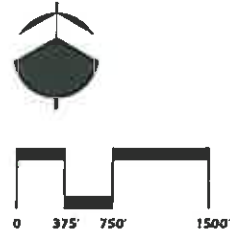
- Fernhill Wetlands Mitigation Bank
- The previous Zucher Farm Property
- Forest Grove Treatment Plant and Ponds
- Stream Operations Center
- Field Operations Materials Handling Facility
- Other agricultural land

The master plan aims to maintain the existing wastewater and stormwater utility functions within the site while fostering water quality innovations, sustainability, and environmentally and socially appropriate land use.

The following document is the result of a collaborative process between Clean Water Services, the City of Forest Grove, and other local stakeholders.

LEGEND - Water

-  Project Boundary
-  Tax Lot Parcel
-  2' Contours
-  Creeks and Streams
-  Tualatin River
-  Wetlands
-  500 Year Flood
-  100 Year Flood
-  Seasonally High Water
-  Seasonal Flow
-  Barney Reservoir Easements
-  Photo Point



EXISTING CONDITIONS

HYDROLOGY

The hydrology of the site is one of the main drivers in the programming and ecological functioning of the site. As shown here, the vast majority of the site is within the Tualatin River flood plain. Water enters or exits at many locations around the site, creating a complex hydrological system.

Holding Ponds

The holding ponds were all originally created for wastewater treatment plant functions. Currently only the northern most pond "holding pond 1" is in use. The remaining ponds fill and drain naturally with flood and ground water.

Fernhill Wetlands and Dabblers Marsh

The Fernhill Wetlands and Dabblers Marsh are fed by runoff and flooding from the surrounding areas. The wetland cells are located within the Barney Reservoir Easement. There is additional Barney Reservoir easement on the west side of Fernhill Road.

Wetland Mitigation Bank

The Wetland Mitigation Bank receives water from seasonal flooding of the Tualatin River.

Gales Creek

The creek floods the adjacent agricultural land through a breach. This has created hydric soils and seasonal flooding across a section of the agricultural land.

(A) Flooded Agricultural Land



(B) On Site Swale



(C) Ponds & Access Road



(D) Flooded Access Road

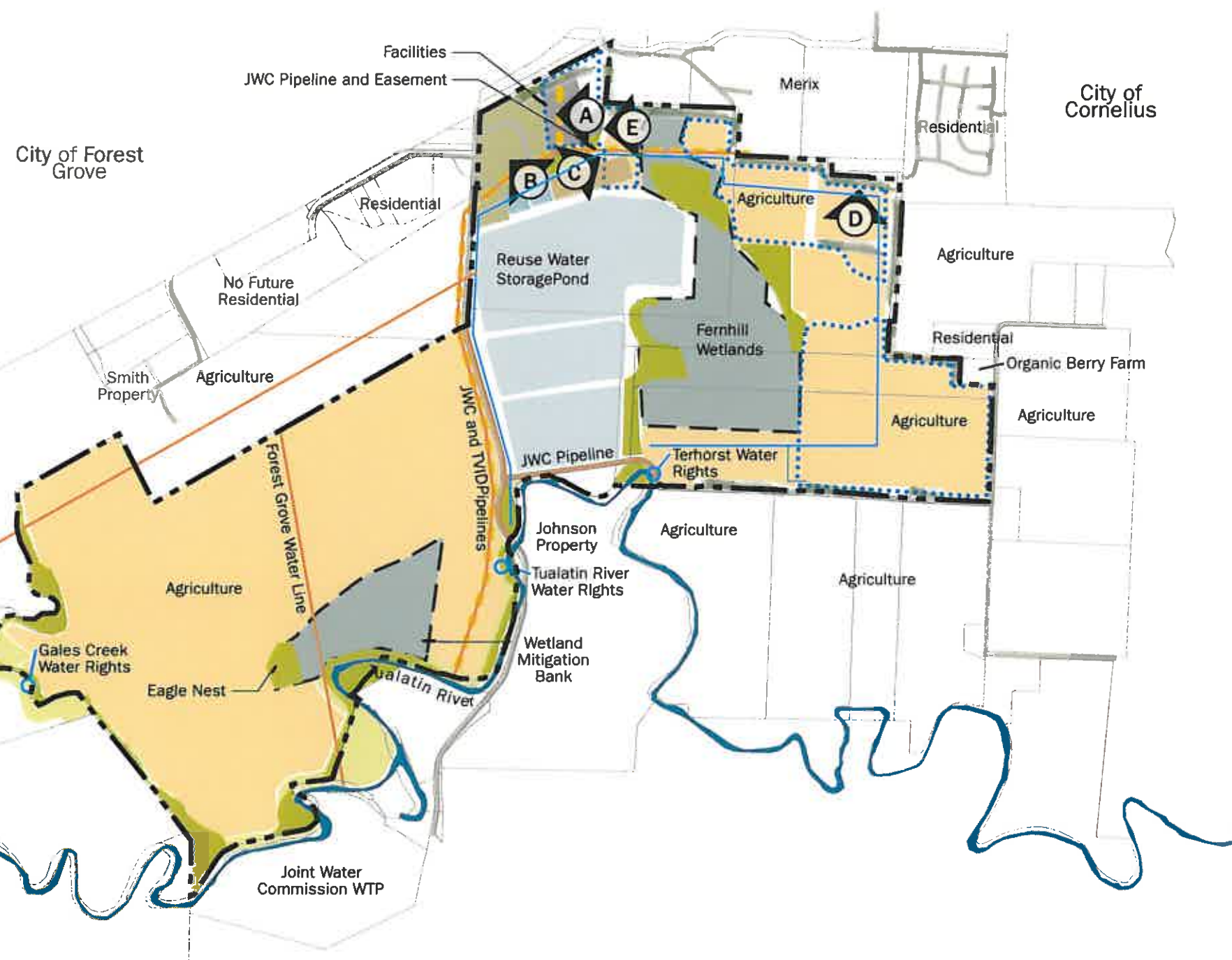


(E) Holding Pond & Facilities



LEGEND - Land Use

- Project Boundary
- Tax Lot Parcel
- Tualatin River
- Wetlands
- Existing Vegetation
- Current Revegetation Project Areas
- Agricultural Land
- Irrigated land
- Irrigation Pipe Line to Reuse
- Water Right
- Pipeline
- Pipeline Easement
- WWTP
- Materials Handling Facility
- Stream Operations Center
- Poplar Screen Rows
- Metro
- Ponds
- Photo Points



- (A)** Nursery Stock
- (B)** Irrigation Equipment
- (C)** Materials Handling Facility
- (D)** Agricultural Land & Poplar Screen
- (E)** Woody Debris Inventory and Storage



EXISTING CONDITIONS

LAND USE & VEGETATION














Facilities
The Forest Grove Wastewater Treatment Plant (WWTP) is currently in operation with plans for expansion. The Stream Operations Center is to the east. The Field Operations Materials Handling Facility stores materials in an open lot and under covered structures.

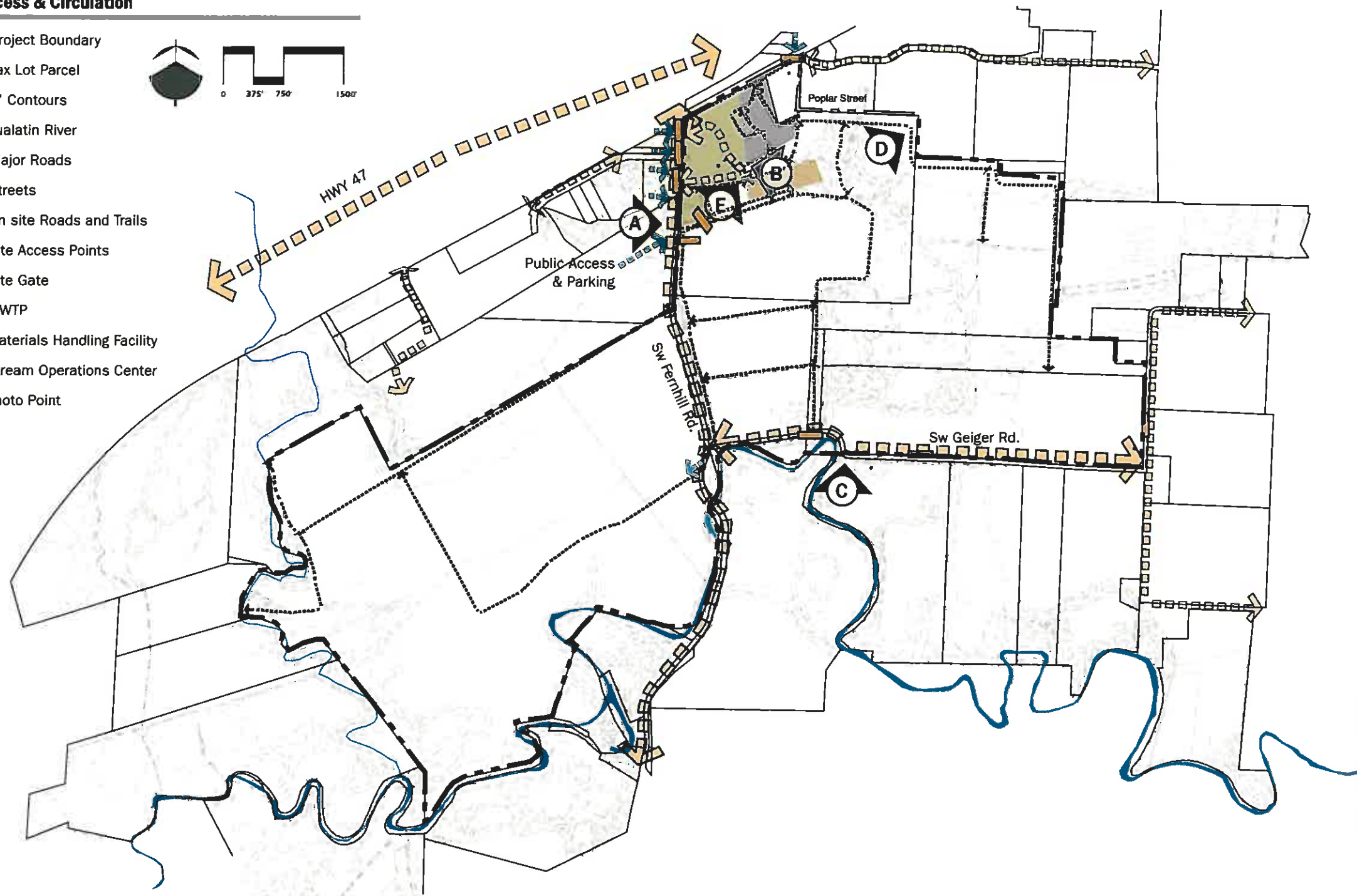
Agricultural
The eastern and western ends of the site are currently leased for annual crop agriculture or left fallow. The eastern side of the site, which is less prone to flooding, is higher quality agricultural land and has access to reclaimed irrigation water. The western side of the site is prone to seasonal flooding and is lower quality farm land.

Riparian and Wetland areas
The wetlands and riparian areas house a wide variety of plants and provide habitat and cover for migrating birds and a variety of other species. The holding pond functions as part of the WWTP.

Buffers and Easements
Aging poplar buffers currently border much of the site and riparian corridors hug the southern and western edges. A number of pipelines and associated easements run through the middle of the site and facilities areas.

LEGEND - Access & Circulation

-  Project Boundary
-  Tax Lot Parcel
-  2' Contours
-  Tualatin River
-  Major Roads
-  Streets
-  On site Roads and Trails
-  Site Access Points
-  Site Gate
-  WWTP
-  Materials Handling Facility
-  Stream Operations Center
-  Photo Point



(A) Information Kiosk



(B) Roads on Site



(C) Access gate and Trail



(D) Access Road and Poplar Screen



(E) WWTP Gate



EXISTING CONDITIONS

ACCESS & CIRCULATION

Vehicular Access

The site is located slightly south of Highway 47, Fernhill Road bisects the property, and SW Geiger and other residential roads delineate the southeast corner of the property. Public vehicular access to the site is limited to a parking lot along SW Fernhill Road on the north side of the holding ponds. Public access supports recreational birding and hiking activities.

Limited access from SW Fernhill Road and Poplar Street is permitted through locked gates into the facilities areas of the site. Gating and fencing around the Clean Water Services Facilities is for security. Agricultural access roads bisect the eastern and western portions of the site from SW Fernhill Road and SW Geiger Road. Some of these roads are gated and some are open.

Pedestrian Access

Current pedestrian access is directed around the ponds and through Dabblers Marsh by interpretive maps and viewing structures. These paths are accessed from the main public parking lot on SW Fernhill Road. Pedestrian access to the remainder of the site is not restricted and the site is frequently used by runners and people walking dogs.

CHARRETTE NOTES

A design charrette was held on March 16th, 2007 at Clean Water Services. Staff and stakeholders were invited to share information about the site and develop conceptual site plans for the property. Workshop attendees included:

Victoria Lowe, Forest Grove City Councilor
Tom Gamble, Forest Grove Director of Parks and Recreation
Nicky Iverson, Joint Water Commission
Jim Morgan, Metro
Tom Murtaugh, Oregon Dept. of Fish & Wildlife
Wally Otto, Tualatin Valley Irrigation District
Dean Moberg, USDA Natural Resources Conservation Service
Deke Gundersen, Pacific University

Clean Water Services Staff:
Bob Cruz, Deputy General Manager
Mark Poling, Wastewater Treatment
Tom VanderPlaat, Watershed Management
Kendra Smith, Watershed Management
Brian Vaughn, Watershed Management
Chris Bowles, Field Operations
Sheri Wantland, Public Affairs

The charrette is outlined here.

SITE INTRODUCTION

As part of the land transfer agreement the following has been agreed upon within the project boundary:

- 1) Clean Water Services will allow ongoing public access to the existing trails.
- 2) City of Forest Grove may construct, maintain, and/or expand existing trails and may install an interpretive center, kiosks or similar facilities on the property to educate the public about Fernhill Wetlands with approval by Clean Water Services.
- 3) City of Forest Grove is responsible for all costs associated with the design, construction, insurance and maintenance of any facilities initiated by the City.

CHARRETTE GOALS

While Clean Water Services is not a parks provider, they are interested in being a good land steward and providing access, education opportunities, and facilities/operations space.

The charrette goal is to develop a cohesive vision for the site that works in concert with Clean Water Services' (the District's) on-site facilities and long term mitigation and management needs.

REVIEW AND DISCUSSION OF EXISTING CONDITIONS MAPS

Additional information and clarification of existing information was incorporated into the previous existing conditions maps.

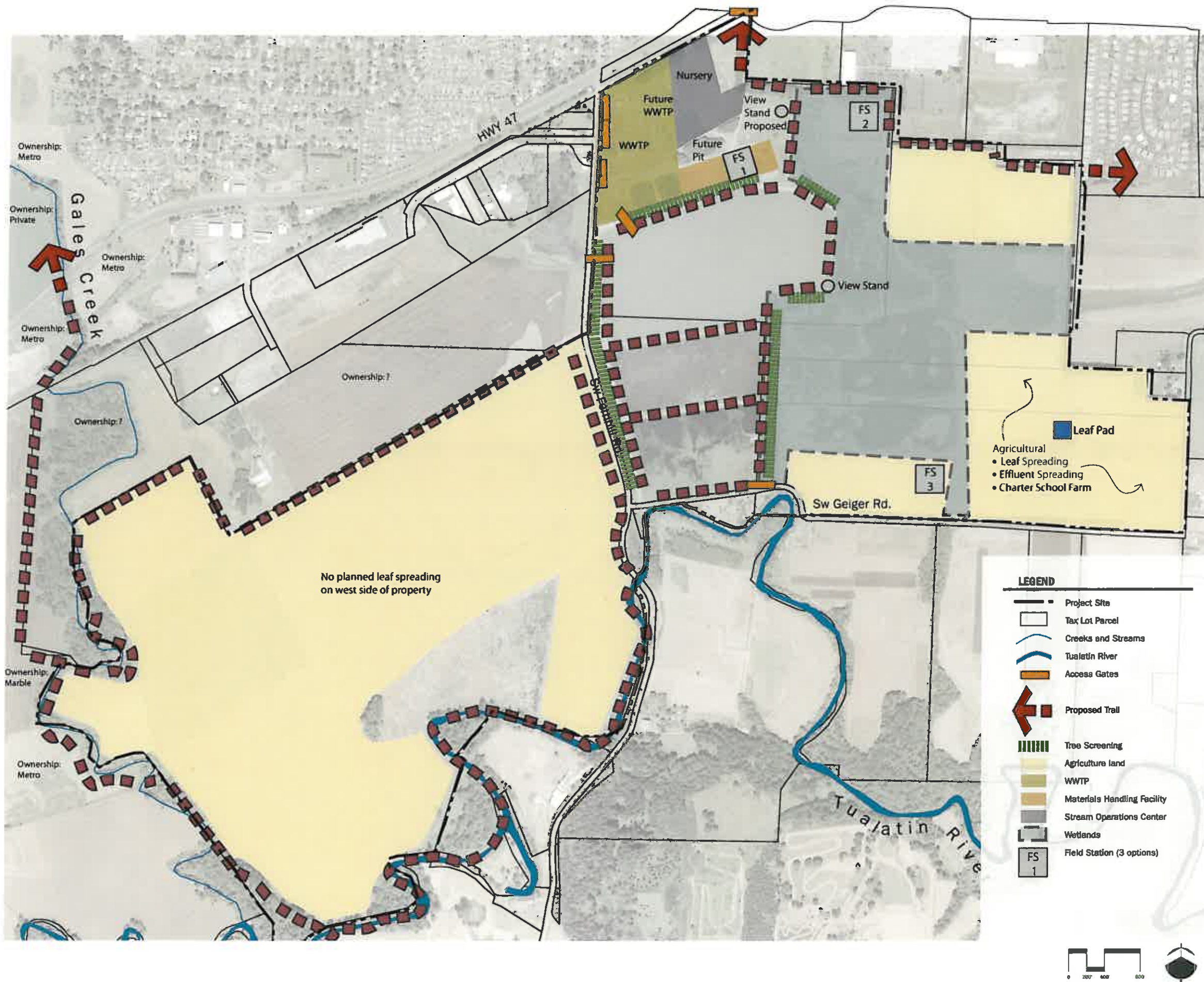
REVIEW AND DISCUSSION OF SITE ISSUES

Site issues include:

- 1) Flooding agricultural land
- 2) The eastern swale and seasonally wet areas
- 3) Backwater channel north of Geiger Road
- 4) The unused ponds (# 2 and #3)
- 5) Forest Grove WWTP access and screening
- 6) Stream Operation Center site needs
- 7) Local and Regional Trail Systems
- 8) Materials Handling Facility needs and uses
- 9) Public access and interpretive elements
- 10) Visitor orientation and viewpoints
- 11) Poplar screen rows
- 12) Public vs. private access
- 13) Farm access roads
- 14) Limited or closed access roads
- 15) RV storage and adjacent residential areas
- 16) Geiger Rd. property ownership, use, and access issues

WORKING GROUP MAPS

Charrette participants worked in three sub groups to develop conceptual plans for property. Their maps and ideas follow.



CHARRETTE WORKING GROUPS

Group 1

Group one divided the property into 3 distinct use zones - wetland, agricultural, and facilities uses that will help clarify boundaries, connections, and buffers.

To increase pedestrian connections and take advantage of the entire site, loop trails are created throughout the site. Northern and eastern trail connections provide access to adjacent and regional areas of interest.

To facilitate educational opportunities the group proposed 3 possible locations for the field station or future charter school location. (Note: At the time of the charrette, a proposed charter school was looking for a site, but subsequently it was located elsewhere.) One proposed field station site uses the existing service roads and developed area. Location two provides a solid, non-flooding location with views down into the wetland cells. Location three would incorporate a balance of cut and fill to create a dry site along Geiger Road.

The City currently contracts with local farmers to spread leaves collected through citywide curb pickup, and the group incorporated this leaf spreading in the eastern agricultural fields.

- Leaf Pad**
- Leaf Spreading
 - Effluent Spreading
 - Charter School Farm

CHARRETTE WORKING GROUPS

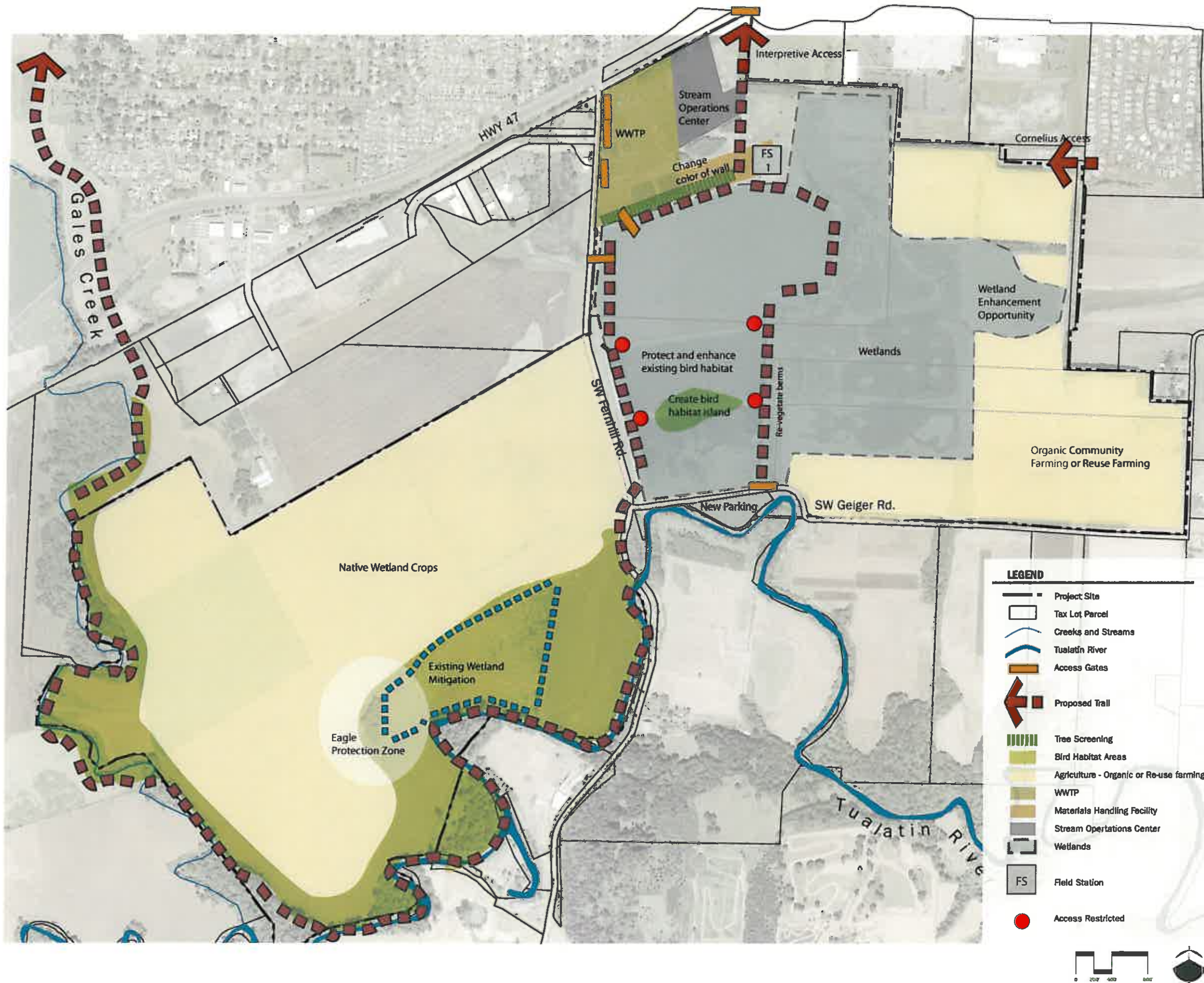
Group 2

The group aimed to maintain existing facilities at the dry northern end of the site, leaving the remainder of the site for agriculture and wetlands. To increase visual separation additional screening was added to the zone between pond 1 and the facilities. Ponds 2 and 3 are redesigned to create additional habitat opportunities.

Access will be accommodated off of Poplar Street, Fernhill Road, and Geiger Road through driveways, some gated and some public.

Agricultural uses are to be fine tuned for the site and the community. Proposed agricultural uses for the eastern fields include community supported agriculture and organic community agriculture. Agriculture on the west parcel should include conventional agriculture and wetland plant production in seasonally wet zones.

In order to provide increased nesting habitat for birds, trail connections are limited to a loop around the ponds. Riparian trails are located just outside a riparian zone instead of next to the river.



CHARRETTE WORKING GROUPS

Group 3

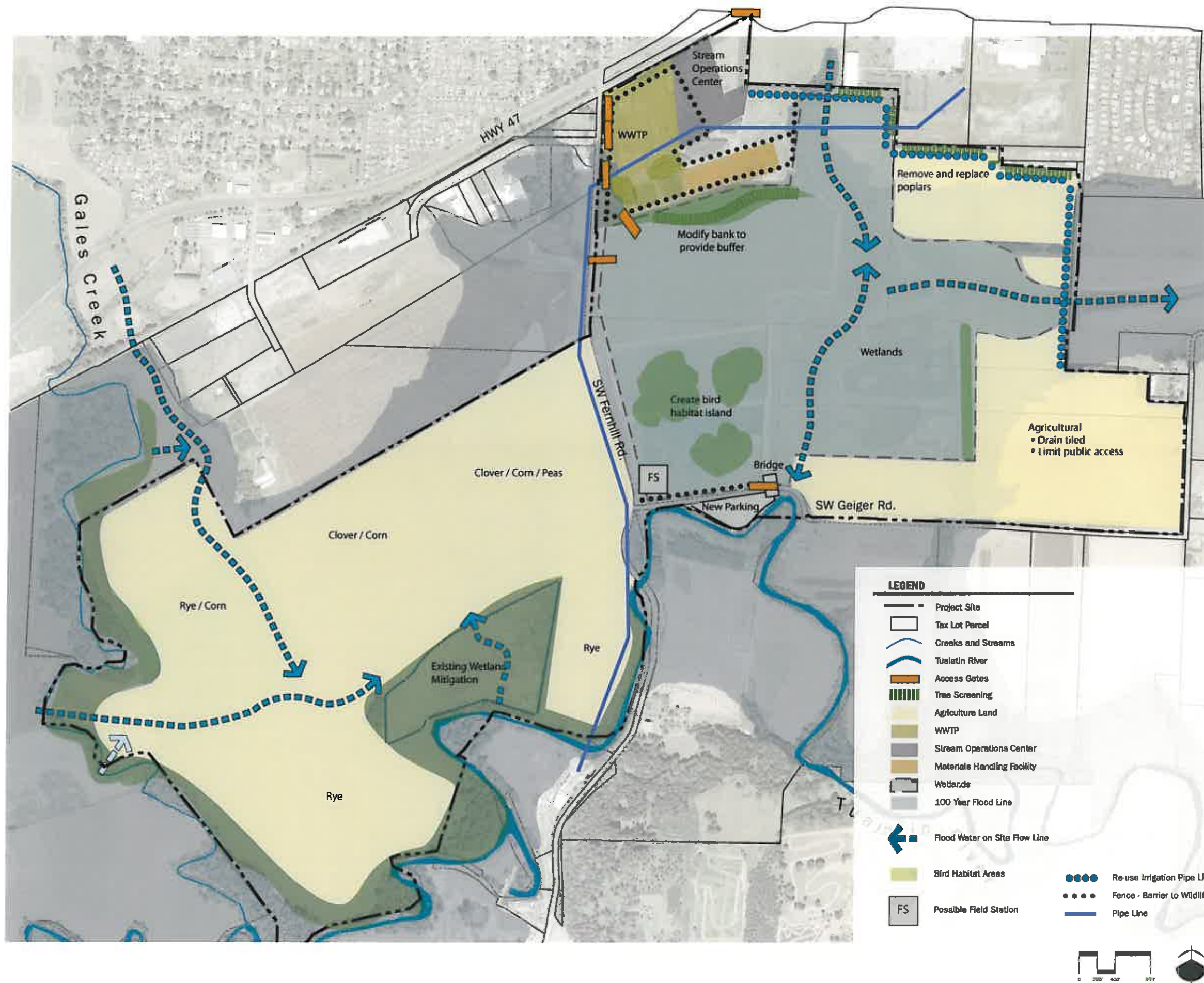
Agricultural uses are to be fine tuned by developing a farm plan for the site, including perennial crops and native wetland crops appropriate to the soil types and inundation levels.

To increase access to water and benefit environmental quality, irrigation take outs will be improved.

In an effort to buffer riparian areas and create additional habitat all stream buffers will be enhanced with native vegetation.

The proposed educational field station would be located on the corner of pond 2 near the intersection of Fernhill Road and Geiger Road, and would be built on stilts above the water. Parking on the Geiger Road property would accommodate the field station and other public access to the site.

The ponds offer opportunities to enhance the natural habitat and wetland system.



FINAL CONCEPT PLAN

The final concept plan outlines a framework for the short and long term development of the site based on the information and issues gathered in the design process. The master plan aims to maintain the existing wastewater and stormwater utility functions within the site while fostering water quality innovations, sustainability, and environmentally and socially appropriate land use.

Intensive land uses have remained in the northern part of the site with extended screening and fencing.

Wetland and habitat enhancement activities are clustered in the central areas of the property and along sensitive riparian corridors. These may include constructed wetlands for wastewater treatment, water quality credit and/or wetlands trading, and ecosystem services banks.

Agricultural uses are clustered to the eastern and western sides of the property and incorporate ideas for more culturally and environmentally sensitive agricultural uses.

Pedestrian and vehicular access has been clarified and organized for a long term access plan.

The main areas of use are labeled in the Legend and detailed in the following pages.



Legend

- | | |
|------------------------------------------------------|-------------------------------------------------------|
| 1 WWTP | 9 Wetland Creation / Enhancement Area From Pond 2 & 3 |
| 2 Stream Operations Center | 10 Fernhill Wetlands |
| 3 Materials Handling Facility | 11 Wetland Creation / Enhancement |
| 4 Interpretive Center Location Option A - Short Term | 12 Buffer / Screening - Multifunctional Hedge Row |
| 5 Interpretive Center Location Option B - Long Term | 13 Parking for Interpretive Center |
| 6 Interpretive Center Location Option C - Long Term | 14 Agricultural Lands |
| 7 Interpretive Center Location Option D - Long Term | 15 Riparian Buffer Zone |
| 8 Re-Use Water Holding Pond | 16 Eagle Habitat |
| | 17 Wetland Mitigation Bank |
| | 18 Regional Trail System |





WASTEWATER TREATMENT PLANT

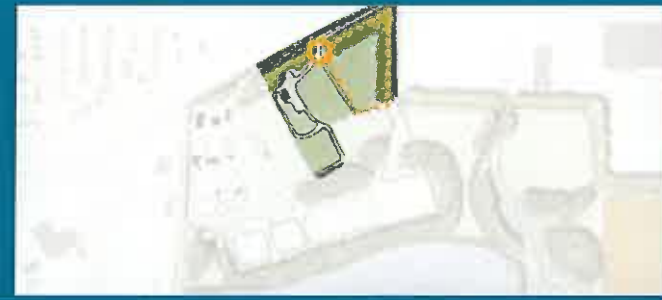
The existing Clean Water Services Wastewater Treatment Plant is located on the corner of Highway 47 and SW Fernhill Road. Daily access to plant operations and offices is through four gated access points off of SW Fernhill Road.

Preliminary Goals and Objectives

- Maintain security of the plant through gated entrances, secure fencing, and appropriate siting.
- Provide the appropriate space for the planned short term plant expansion, as shown above with the orange outline.
- Support a collective intensive use zone through a collaborative facility fencing, entrance and screening plan.
- Provide the appropriate space for constructed and natural wetlands for use in sustainable/ natural wastewater treatment innovations.

Implementation

Existing security and screening functions should be maintained and enhanced in the 1-5 year range as the facilities are upgraded. This should include enhanced native screening between pond 1, the public parking area, and the facilities area.



STREAM OPERATIONS CENTER

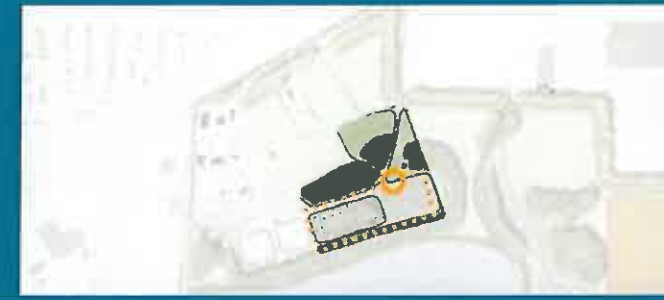
The Clean Water Services Stream Operations Center is the headquarters for stream restoration work. The workshop houses tools and equipment, and associated outdoor spaces support storage and horticultural needs including potting materials, plant storage, cutting stock and large woody debris storage.

Preliminary Goals and Objectives

- Maintain functions of the Stream Operations Center.
- Provide an appropriate area for future operations while encouraging effective use of space.
- As-needed expansion area is shown above with an orange outline.
- Support a collective intensive use zone through a collaborative facility fencing, entrance and screening plan.

Implementation

The spaces and roads within the Stream Operations Center provide flexibility for future expansion or seasonal changes. Fencing updates and screening enhancements will be implemented in the 1-5 year timeline. Screening enhancements should focus on native site buffers. See the site buffers and screening section on the page 12.



MATERIALS HANDLING FACILITY

The Materials Handling Facility has 3 covered/ roof structures and associated screening fences where materials collected during maintenance of the stormwater system (rock, street dirt, leaves, etc.) are stored.

Preliminary Goals and Objectives

- Maintain a functioning and accessible materials storage facility.
- Screen Material Handling Facility from view of adjacent uses.
- Provide an appropriate space for future program changes while encouraging effective use of space. As-needed expansion area is shown above with an orange outline.
- Support an intensive use zone through collaborative facility fencing, entrance and screening plan.
- Provide storage pad for recycled leaves to be spread on agricultural fields.

Implementation

Screening of the Material Handling Facility should be one of the first initiatives of implementation. Plant materials will need time to establish before providing appropriate screening. Buffers should incorporate native plant communities that support wildlife and provide screening functions. Screening efforts should be focused south of the facilities and north of the holding pond.



FIELD STATION/ INTERPRETIVE CENTER

A proposed educational field station could provide research labs/ educational classrooms/ interpretation/ and observation. A raised facility on stilts would provide appropriate access to the natural resources while protecting the structure from the seasonal flooding of the property.

Preliminary Goals and Objectives

- To provide an appropriate location for an educational component on the site. The three sites shown above outlined in orange show possible long term locations of the Field Station. These sites take advantage of existing and future wetland restoration as well as access to Geiger and Fernhill Roads.
- The field station would need to be supported with trails networks, parking and other public amenities.

Implementation

While site restoration is still in progress, a short term location for the field station has been identified near the existing public parking lot, as shown above on the far left. The station could be relocated in the 5-10 year range to a long term site once the facility and restoration activities can support the use.



WETLAND CREATION AND ENHANCEMENT AREA

There is an opportunity for wetland enhancement for natural, sustainable wastewater treatment. The existing ponds fill seasonally with flood water and already provide habitat for many birds, and could be enhanced to provide habitat and increased wetland functions.

Preliminary Goals and Objectives

- To increase habitat and wetland function
- To provide opportunities for water quality innovations for natural, sustainable wastewater and stormwater treatment.
- The existing pond and dike trail system creates conflict between nesting birds and humans. These conflicts can be reduced by restricting trail access to the boundary of the ponds and removing the dike between pond 1 and 2.

Implementation

In the 1-5 year range trails should be rerouted to an overall loop around ponds 1, 2, and 3. The dike access can be restricted to certain users or certain times of year by installing locking gates. In the 5-10 year range, habitat islands will be created from dike fragments, and overall wetland and habitat functioning increased through regrading and native revegetation activities.



WETLANDS

Existing Dabblers Marsh and Fernhill Wetlands are wetland mitigation areas that create habitat and fit in with the overall hydrology of the site. These wetlands should be preserved for their ecological functions. There are additional opportunities for wetland creation/ enhancement on site for natural, sustainable wastewater treatment and regional ecosystem services.

Preliminary Goals and Objectives

- To maintain and enhance wetland functioning.
- To enhance additional wetland areas on site as appropriate. The area outlined above in orange has seasonal flooding and regular standing water, and should be evaluated for restoration potential.
- To provide natural, sustainable wastewater treatment innovations.
- To provide the opportunity for regional ecosystem services banking.
- The Tualatin River backwater channel along the west end of the wetlands should be enhanced and connected to associated wetland areas.

Implementation

Existing wetlands should continue to be protected and enhanced. In the 1-5 year range the additional eastern area should be evaluated and restored accordingly.



SITE BUFFERS AND SCREENING

Poplar rows buffer sight and sound from adjacent uses, and define the majority of the property edges east of Fernhill Road with a clear visual edge between the property and surrounding sites. However, the poplar buffers are aging and may lose their buffering functions.

Preliminary Goals and Objectives

- Maintain and expand the site buffers along the edges of the site.
- While poplar rows exist along half of the sites edges, they are aging and their future condition should be considered. As poplars die out, existing hedgerows should be interplanted with native species. As development occurs around the site, areas with no hedgerow or riparian buffer should be evaluated and planted with appropriate native buffer plantings.

Implementation

Screen rows should be thinned and replanted with a mix of native species as their condition begin to deteriorate. Native trees and understory plantings will create a long term buffer for the site. Additional sites should also be considered for buffer plantings in the 1-5 year range.



PUBLIC PARKING LOT

A public parking lot will be located south of Geiger Road and north of the Tualatin River. The parking lot will provide public access to the wetlands on site, the field station and the regional trail system.

Preliminary Goals and Objectives

- To provide a public access point for education and recreation within the site.
- To bring a public presence to this area as a deterrent to illegal dumping, encampments, and other undesirable activities.

Implementation

The parking lot will be established in the 5-10 year time frame as the regional trail system, field station and wetland enhancement become attractions for public users. In the 1-5 year range the public will continue to use the existing parking lot and access point along SW Fernhill Road.



AGRICULTURAL LAND

The agricultural land on site can be divided into two main groups, western and eastern. The eastern land is higher ground that is less likely to flood and is close to an existing irrigation system. The western agricultural land is prone to flooding and has large areas of hydric soils.

Preliminary Goals and Objectives

- To maintain an economically profitable farming system while improving soil resources, protecting water quality and providing wildlife habitat.
- To implement sustainable farming practices such as no-till farming, native straw/ seed crops, long term perennial grass, efficient irrigation, crop rotations, cover crops and integrated pest management.

Implementation

In the short term 1-5 years these agricultural concepts will be integrated into the site farm plan and future lease agreements between the District and farmers.



RIPARIAN BUFFER AND HABITAT AREAS

The Tualatin River and Gales Creek riparian corridors delineate much of the southern and western borders of the site. These buffers should be protected, and expanded to provide enhanced ecological effects and habitat benefits.

Preliminary Goals and Objectives

- To protect and enhance the Tualatin River and Gales Creek riparian buffers on site.
- Riparian buffers provide water quality benefits, filter pollutants, reduce temperatures instream and provide wildlife habitat.

Implementation

Riparian restoration and corridor expansion projects are already underway on site. In the short term 1-5 year range these efforts should be continued to ensure a minimum 100'-150' vegetated riparian corridor from all waterways. In the long run these buffers should be enhanced to promote native populations, provide limited but effective public access, and support improved water quality.



WETLAND MITIGATION BANK

The District established this wetland mitigation bank before state standards were in place as guidance. There are credits in this bank that the District is holding until wetland function can be guaranteed. In the meantime, an intensely farmed agricultural field has been transformed into a healthy, diverse riparian forest that now provides wildlife habitat for beavers, bald eagles, amphibians and rare plants. The site buffers active agriculture and the Tualatin River, filtering pollutants and shading the water, and provides improved floodplain storage.

Preliminary Goals and Objectives

- Maintain wetland bank for wetland and/ or habitat value.
- Consider selling remaining credits for habitat mitigation.

Implementation

Continue to maintain the mitigation bank and wetland area for maximum wetland functioning and habitat values.



REGIONAL TRAIL SYSTEM

The natural features on site provide a valuable resource for the community. The trails system provides access to wildlife viewing and recreation activities. Beyond the site a number of natural areas and trails systems provide opportunities for off site regional trail connections.

Preliminary Goals and Objectives

- To provide a strong central link to a regional trail system that brings regional pedestrians and bicyclists into and through the site.
- To connect to local trails and greenways; Forest Grove Trail System to the North, Metro greenspaces to the west and south, and Cornelius to the east.

Implementation

In the short term the on-site trail systems can be clarified and built. Soft trail connections can be made that would suggest future regional trail connections and familiarize current users with their route. In the 5-10 year range biking and walking trails may be constructed by local park providers to connect surrounding regional public spaces.