

Draft Project Objectives Report

Upper Petaluma River Watershed Flood Control Project - Scoping Study

Subject: Draft Project Objectives Report

Date: May 19, 2011

The purpose of this memorandum is to conceptually describe the Key Project Purpose and core objectives, as well as proposed supporting objectives. The current objectives have been established with input from the Sonoma County Water Agency (Water Agency) and the City of Petaluma (City) in project kick-off meetings held in November and December 2010 as well as additional meetings and communications with the Water Agency. The objectives described in this memorandum are consistent with goals described in the Petaluma Watershed Enhancement Plan (PWEPP; Goal B, Goal D) and the General Plans for the City and the County of Sonoma (Petaluma – 4-G-1, 8-G-6, 8-G-8 and 8-G-9; Sonoma County – OSRC-8, WR-1, WR-2, WR-4 and WR-6).

Identification of objectives for the Upper Petaluma River Watershed Flood Control Project is a fundamental step in developing a multidisciplinary flood control program with multi-benefit projects. The objectives outlined below will be further refined with stakeholder input in upcoming workshops, and will then serve as a guide for the project from scoping through implementation.

The established objectives and their components will be used to provide specific focus to conceptual project development by answering the question “What are we trying to accomplish?” In this manner, the objectives provide a qualitative description of desired future conditions, and objective components provide measurable conditions that will define projects.

The Scoping Study process is based on first identifying objectives for the study area, then identifying conceptual project alternatives that aid in meeting the objectives as appropriate.

1 Key Project Purpose

The Key Project Purpose for the Upper Petaluma River Watershed Flood Control Project (Project) is:

Develop a stormwater management/groundwater recharge project(s) that will provide flood hazard reduction and groundwater benefits within the Upper Petaluma River Watershed.

This is a broad purpose consistent with the Water Agency’s *Water Supply Strategies Action Plan* (2010) that, when achieved, will:

- Reduce flooding and associated flood damages; and
- Increase groundwater recharge and improve water supply reliability.

The project, or suite of projects, that is implemented to achieve the Key Project Purpose is intended to include both flood protection and groundwater recharge elements. Many of the types of projects that will fulfill

Project Example:

A detention basin is a facility that can be in-stream or off-stream where velocities are reduced and has a passively controlled outlet. Located over soils with a high infiltration rate, such a basin would provide flood protection through peak attenuation and additional groundwater recharge while the water was detained. Depending on design features, a detention basin could also improve surface water quality, remove sediment, provide additional habitat, and be a destination for educational opportunities and interpretation.



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the Key Project Purpose will offer the opportunity to provide additional benefits such as:

- Improving surface water quality;
- Stabilizing the Petaluma River and its tributaries with regards to erosion and sedimentation;
- Improving habitat and the potential for habitat; and
- Providing for recreation and educational opportunities.

These benefits are further described in the sections below as well as descriptions of the core and supporting objectives that will help to achieve these benefits.

2 Core Objectives

Per the Key Project Purpose, this Project will lead to a project with two Core Objectives:

- Flood Hazard Reduction
- Groundwater Recharge

As detailed below, the objectives and their objective components (i.e. aspects of the objective that contribute to its full achievement) are provided below for the focus areas of flood hazard reduction and groundwater recharge. These core objectives are critical to the success of the Project and the achievement of the Key Project Purpose. The objective components provide a more tangible concept that can be used to measure how well each project alternative meets the objective.

2.1 Flood Hazard Reduction

Flood hazard reduction is one of the drivers for the Project. Based on a review of 100-year floodplain maps created by the Water Agency and Federal Emergency Management Agency (FEMA), 100-year inundation areas include both rural and undeveloped land as well as highly developed properties, including some commercial areas. It is important to balance the need for property protection and safety from floods with the many benefits that floodplains provide, not only related to flood flows but also other areas such as habitat and water quality. It is not the intent of this objective to eliminate all of the floodplains, but rather to utilize or enhance them where possible and reduce them only where required. A flood hazard reduction objective and three objective components are proposed in **Table 2-1**.



Table 2-1: Flood Hazard Reduction Objective

Core Objective: Improve management of stormwater that contributes, directly or indirectly, to reduced flood hazards.	
Objective Component	Comments
A. Implement improvements to flood protection system necessary to manage up to the 100-year storm event at General Plan land use conditions for private properties	Evaluate role of natural flood plains for accommodating projected 100-year storm events. Consider both detention and conveyance type projects. Implement best management practices. Consider projects sized for more frequent events.
B. Promote coordination of flood protection projects within and downstream of the Project area	Ensure that implementation of one project does not adversely impact other projects or areas.
C. Design and maintain streams and flood protection facilities to convey design flows while supporting natural ecosystem functions to the greatest extent possible	Develop projects that incorporate environmentally sensitive approaches such as biotechnical bank stabilization, meandering channels, shade, connectivity, wildlife, and fish passage.

2.2 Groundwater Recharge

Water supply is a significant concern to the Water Agency, the Water Agency’s contractors, and the Water Agency’s partners, particularly due to the changed strategies and long term outlook brought about by the Russian River Biological Opinion (2008), the recent economic downturn, and other long-term considerations such as climate change. Based on these changes, groundwater recharge is another driver of the Project. Groundwater resources can supplement surface water supplies and alternative supplies, such as recycled water. Recharging the local aquifers with stormwater whenever possible will enhance water supply reliability. **Table 2-2** proposes a groundwater recharge objective for the Project and two objective components.

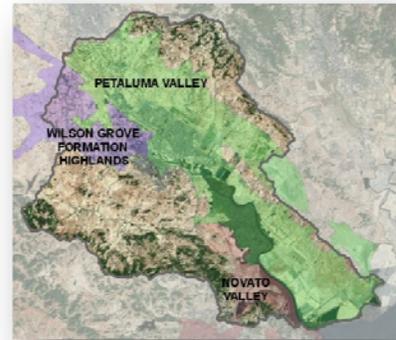


Table 2-2: Groundwater Recharge Objective

Core Objective: Increase beneficial recharge of groundwater, whether or not that recharged groundwater is directly accessible as water supply.	
Objective Component	Comments
A. Provide recharge opportunities to enhance aquifer storage	Utilize available stream flow to recharge the aquifer.

3 Supporting Objectives

While not critical to achieving the Key Project Purpose, a multi-benefit project can be created by also considering:

- Water Quality
- Water Supply
- System Sustainability
- Ecosystem
- Agricultural Land
- Open Space
- Community Benefits

Proposing and implementing multi-benefit projects will help address many of the project challenges and constraints, described in the *Draft Issues Assessment* (RMC, 3/11), including:

- Stakeholder agreement;
- Project partnering;
- Public support;
- Regulatory approval; and
- Funding.

The sections below propose objectives and objective components, supporting the core objectives, which will help to qualify and quantify the additional benefits associated with developing the Project's flood protection and groundwater recharge project alternatives.

3.1 Water Quality

The Petaluma River has been identified by the San Francisco Bay Area Regional Water Quality Control Board as an impaired water body on the 303d list for:

- Diazinon
- Nutrients
- Pathogens
- Sediment
- Trash; and
- Nickel.



Many of these pollutants can be traced to runoff from the watershed and will need to be addressed as part of a response to upcoming TMDL limits, coordination with regulatory agencies, and good watershed stewardship. Because there are zones of high infiltration, it is reasonable to expect that mobile pollutants could potentially threaten groundwater quality in addition to surface water quality. If stormwater is expected to be a higher quality than the groundwater though, then stormwater infiltration could improve overall groundwater quality. Recharge can also help to prevent saline intrusion and side effects of overdraft such as additional geothermal contributions and undesirable migration of constituents. **Table 3-1** proposes a water quality objective for the Project and five objective components.

Table 3-1: Water Quality Objective

Supporting Objective: Protect or improve water quality of surface water (Petaluma River, its tributaries and the San Francisco Bay) and groundwater.	
Objective Component	Comments
A. Help to eliminate impaired water body designations	Implement project elements that help to reduce pollutant loads.
B. Provide adequate water quality to sustain aquatic life	Manage pollutants, including temperature, sediments, and pesticides, to support seasonal habitat requirements.
C. Facilitate permitting for long-term operations/maintenance	Implement project elements that will reduce additional requirements and negotiations with permitting agencies such as RWQCB and CDPH.
D. Avoid degradation of aquifer water quality due to infiltration of surface runoff constituents	Design and operate projects so as to avoid aquifer degradation, consistent with the California Antidegradation Policy (Resolution No. 68-16).
E. Improve aquifer water quality	Use high quality stormwater for recharge to mitigate saline intrusion and overdraft effects.

3.2 Water Supply

Water supply is a significant concern to the Water Agency, the Water Agency's contractors, and the Water Agency's partners, particularly due to the changed strategies and long term outlook brought about by the Russian River Biological Opinion (2008), the recent economic downturn, and other long-term considerations such as climate change. Some of the increasing demands for potable water can be offset by using stormwater where high quality water may not be necessary. **Table 3-2** proposes a water supply objective for the Project and one objective component.



Table 3-2: Water Supply Objective

Supporting Objective: Increase or improve water supply availability, reliability and flexibility for domestic, municipal, industrial, agricultural, and environmental use.	
Objective Component	Comments
A. Offset use of groundwater and potable surface water by utilizing storm flows in excess of the recharge potential for water supply	Utilize available stream flow for immediate use as storage is not an option.

3.3 System Sustainability

System sustainability, in both local and larger contexts, is extremely important to the Water Agency. The Water Agency recognizes that water and energy efficiency are critical components to ensuring that the resources are available for future generations. System sustainability also refers to physical processes. Channel stability and sedimentation is a concern for the Water Agency and other organizations associated with Petaluma River. Not only can sedimentation impact hydraulic conveyance capacity but it has impacts on other areas such navigation, habitat, and water quality. Erosion and sedimentation also impact maintenance and operation budgets because of the need to repair channels and remove sediment. **Table 3-3** proposes a system sustainability objective for the Project and four objective components.



Table 3-3: System Sustainability Objective

Supporting Objective: Support energy and water efficiency and climate change resiliency of water management systems and developed supplies; provide for channel stability and sedimentation control; and consider the long-term viability of implemented project and impact on affected systems.	
Objective Component	Comments
A. Minimize use of imported energy at the project site	Develop projects with low energy requirements. Use renewable energy resources (i.e. wind, solar) where feasible.
B. Ensure water is used efficiently	Captured water should be used completely and as soon as possible. Efficient water use will reduce dependence on imported water and its related energy requirements.
C. Implement improvements necessary to eliminate or mitigate the effects of erosion and sedimentation on flooding, water quality, and native habitats	Develop stormwater detention, grade control and bank stabilization strategies to minimize streambed erosion and undesirable sediment accumulation.
D. Implement improvements that facilitate a streamlined permitting process for long-term operational and maintenance strategies for stream systems	Develop projects that incorporate sediment management strategies. Environmentally sensitive approaches such as biotechnical bank stabilization are preferable.

3.4 Ecosystem

Part of the Water Agency mission is to manage water resources in an environmentally sensitive manner. The Water Agency shares the responsibility for environmental stewardship with other local and regional agencies. **Table 3-4** proposes an ecosystem objective for the Project and four associated objective components.



Table 3-4: Ecosystem Objective

Supporting Objective: Improve ecosystem function and/or habitat enhancement, especially for listed species.	
Objectives	Comments
A. Integrate environmental and habitat requirements into project	Provide water quantity and quality to sustain native fisheries and other aquatic life. Consider flow regimes, water temperature, and passage in a manner that reflects environmental and habitat requirements and constraints.
B. Promote sustainable, native habitats wherever possible	Identify opportunities for restoration and enhancement. Identify and restore, where appropriate, habitats affected by non-native invasive species.
C. Preserve and enhance stream buffers and riparian areas	Identify remaining stream buffers and riparian areas for preservation and candidate areas that can be restored to a more natural function. Develop riparian areas to provide shade for habitat improvement.
D. Facilitate permitting for long-term operations/maintenance of stream systems	Implement project elements that will reduce additional permit requirements and negotiations with permitting agencies such as National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (FWS).

3.5 Agricultural Land

Agricultural land and the industries that it supports are important resources in Sonoma County and the Petaluma River Watershed. It is a supporting objective of this Project to protect existing agricultural land to the extent possible. **Table 3-5** proposes an agricultural land objective for the Project and two objective components.



Table 3-5: Agricultural Land Objective

Supporting Objective: Preserve agricultural land use.	
Objective Component	Comments
A. Minimize use of agricultural lands	Develop projects that are not located in currently agricultural lands.
B. Preserve and enhance agricultural lands	Promote projects that provide benefits to agricultural lands such as improved water supply reliability (quality and quantity), channel stabilization, flood relief and TMDL compliance. Incorporate agricultural characteristics into the project design.

3.6 Open Space

Open space is a valuable and oftentimes underappreciated resource. Within the Petaluma River Watershed it can provide the opportunity for recreation for residents and visitors as well as habitat for local and migratory species. **Table 3-6** proposes a water supply objective for the Project and three objective components.



Table 3-6: Open Space Objective

Supporting Objective: Preserve and/or enhance open space.	
Objective Component	Comments
A. Minimize use of open space lands	Develop projects that are not located in currently open space lands.
B. Preserve and enhance open space lands	Incorporate open space characteristics into the project design.
C. Restore degraded open space lands	Improve quality of open space lands.

3.7 Community Benefits

Projects in and around the Petaluma River and tributary streams in the Petaluma Watershed provide a unique opportunity for local agencies to provide recreation, education, and access to different parts of the watershed. **Table 3-7** proposes a community benefits objective for the Project and three associated objective components.



Table 3-7: Community Benefits Objective

Supporting Objective: Create and/or enhance recreation, public access, education, etc.	
Objective Component	Comments
A. Provide educational opportunities for students and the general public.	Provide interpretive resources at project sites.
B. Cooperate with local and regional agencies to implement appropriate recreational features along streams and the Petaluma River.	Provide appropriate recreational features to encourage public appreciation of the natural environment without constraining, or adversely affecting the natural environment, or flood protection function of streams.
C. Protect or enhance visual resources.	Identify and accommodate public concerns for stream and riparian aesthetics within the range of ecologically appropriate improvements.

4 Summary and Next Steps

This memorandum has proposed core and supporting objectives that will lead to the identification of multi-benefit project alternatives. For each objective, several objective components are proposed that will help lead to better fulfillment of the objective and ultimately the Key Project Purpose. The proposed objectives are:

- Core Objectives
 - Flood Hazard Reduction - Improve management of stormwater that contributes, directly or indirectly, to reduced flood hazards
 - Groundwater Recharge – Increase beneficial recharge of groundwater, whether or not that recharged groundwater is directly accessible as water supply.
- Supporting Objectives
 - Water Quality - Improve water quality of surface water and/or groundwater
 - Water Supply - Increase or improve water supply availability, reliability and flexibility for domestic, municipal, industrial, agricultural and environmental use
 - System Sustainability - Support energy and water efficiency and climate change resiliency of water management systems and developed supplies; Provide for channel stability and sedimentation control; and Consider the long-term viability of implemented project and impact on affected systems.
 - Ecosystem- Improve ecosystem function and/or habitat enhancement, especially for listed species
 - Agricultural Land - Preserve agricultural land use
 - Open Space - Preserve and/or enhance open space
 - Community Benefits - Create and/or enhance recreation, public access, education, etc.

An initial stakeholder meeting to review the Project with stakeholders and solicit their input on the issues and objectives identified to date has been scheduled. Also at this meeting, the Project team will solicit stakeholder input on problem areas within the Project boundary related to the Project scope (i.e. flood hazard reduction and groundwater recharge) as well as conceptual project alternatives. Based on feedback from the stakeholders, the issues and objectives will be refined. After development of the conceptual project alternatives, the revised objectives will be used to evaluate the project alternatives via a process to be described in a future memorandum.