

## **APPENDIX B – RD1614 TECHNICAL DOCUMENTS**

### **APPENDIX B-1. WISCONSIN PUMP STATION REPLACEMENT PROJECT ASSESSMENT TECHNICAL MEMORANDUM**

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## **TECHNICAL MEMORANDUM**

October 25, 2012

Project: Wisconsin Pump Station Replacement Project  
Subject: Project Assessment  
Prepared by: Erik E. Almaas, P.E.  
Reviewed by: Christopher H. Neudeck, P.E.

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### **Introduction**

Reclamation District No. 1614 – Smith Tract (RD 1614) is located in San Joaquin County within incorporated and unincorporated portions of the City of Stockton and is responsible for maintaining the levee system that protects nearly 1,600 acres of land dedicated to mostly residential and commercial uses. RD 1614 is bounded by the Calaveras River to the north, Pershing Avenue to the east, Smith Canal to the south, and the San Joaquin River and Riviera Cliffs Subdivision to the west. Stormwater runoff within RD 1614 is collected and conveyed via an extensive network of inlets and pipes owned and operated by the City of Stockton and San Joaquin County. It is then ultimately discharged into the Calaveras River and Smith Canal by one of eleven storm drain pump stations owned and operated by RD 1614. RD 1614 is in the process of designing and obtaining funding for the replacement of one of these pump stations – the Wisconsin Pump Station (see Figure 1). The purpose of this technical memorandum is to describe the project and to provide the justifications and the associated costs for the Wisconsin Pump Station Replacement Project.

### **Need for Replacement**

The replacement of the Wisconsin Pump Station is necessitated by two key factors. First, the current pumping capacity is not sufficient to provide protection against runoff from a 100-year storm event. Second, the existing pump station structure is severely antiquated and in danger of detrimental collapse.

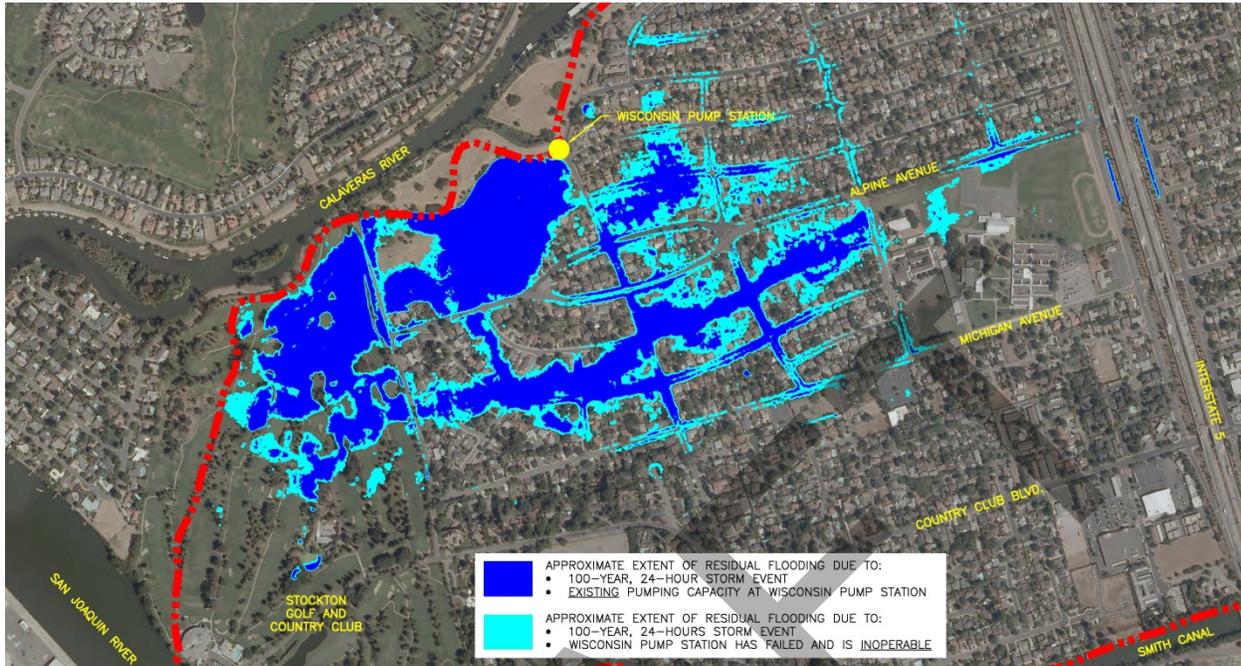
Figure 1. Project Location



### ***Insufficient Pumping Capacity***

Ten of the eleven District storm drain pump stations currently provide sufficient protection against the runoff from a 24-hour, 100-year storm event. The Wisconsin Pump Station is the one exception. This facility provides storm drainage pumping for runoff from a drainage shed of nearly 700 acres – the largest drainage shed within RD 1614. It is currently sized with two pumps with a combined pumping capacity of approximately 10,000 gallons per minute (gpm) that discharge stormwater runoff into the Calaveras River. However, this current pumping capacity is not sufficient, and runoff from a 24-hour, 100-year storm event would likely cause areas of residual flooding within RD 1614 (see Figure 2). As a result, these areas are expected to be mapped as a Special Flood Hazard Area (SFHA) by the Federal Emergency Management Agency (FEMA), and flood insurance requirements for property owners will be affected. To continue protecting nearly 1,700 parcels from future storm and flood runoff events, this facility requires replacement and upgrading of its pumping capacity to approximately 30,000 gpm in order to meet current 100-year flood standards.

**Figure 2. Potential Residual Flooding**



### ***Antiquated Structure***

The Wisconsin Pump Station is an antiquated structure that is comprised of a steel sheet pile stormwater collection sump with a concrete slab and pump house on top. The sump does not have a solid bottom and therefore is subject to groundwater infiltration. Although the pump house on top is in fair condition, the sheet pile sump itself is woefully inadequate and in a state of impending failure. The sheet pile sump is reinforced with wood timber whalers that have rotted. The steel sheet piles themselves have rotted and are collapsing inward (see Figure 3). After assessing the condition of the pump station and consulting with a structural engineer, RD 1614 has determined that the structural integrity of the facility's sump has diminished to a point where there is now great concern that the pump house is in danger of collapsing into the sump. Therefore, any improvements and/or upsizing of the pumping capacity of the pump station would be detrimental to the structural integrity of the sump and that the entire structure should be removed and replaced with a new sump structure.

**Figure 3. Photograph of Existing Sump Structure**



## Work Plan

As District Engineer for RD 1614, Kjeldsen, Sinnock and Neudeck, Inc. (KSN) will be the primary project manager for the Wisconsin Pump Station Replacement Project and will be responsible for all coordination. Much preliminary planning work has already occurred for this project. The environmental assessment and CEQA compliance process has begun and is nearly finalized. Surveying, mapping, and utility research has also been performed, and a 30% design level of design drawings has been prepared.

RD 1614 is currently actively pursuing various funding mechanisms to assist with financing the Wisconsin Pump Station Replacement Project. RD 1614 is cooperating with Stockton East Water District (SEWD) to apply for a Stormwater Flood Management Grant with the State of California, Department of Water Resources (DWR) through its Integrated Regional Water Management (IRWM) grant program. It is expected that this grant would provide for a 50% cost share. In order to procure its 50% local share, RD 1614 is also proceeding with a Proposition 218 measure in cooperation with the San Joaquin Area Flood Control Agency (SJAFC).

Upon receiving sufficient assurances that the project will be adequately funded, KSN will then continue with the design process with the goal of preparing a final set of construction documents including improvement plans and specifications. Design services will include hydraulic modeling, pump selection, site planning, grading, structural design, and analysis of geotechnical studies. Preliminary calculations indicate that the new pump station will require a total pumping capacity of 30,000 gpm. The design will also include a light-duty pump that is intended to pump minor "nuisance" flows and to evacuate the water below the lowest pumping water level of the main duty pumps. It is anticipated that other engineering disciplines will be added to the KSN design team including, but not limited to, geotechnical, structural, and electrical.

KSN will also be providing construction management services on behalf of RD 1614. These services are expected to include agency and permitting coordination, bidding, contract administration, and construction inspection. Potential permitting agencies consist of the State of California – Department of Fish and Game (DFG), the Central Valley Flood Protection Board (CVFPB), the U.S. Army Corp of Engineers (USACE), and San Joaquin County.

Construction will likely consist of the following: demolition; earthwork excavation; cast-in-place concrete sump structure with steel grating and steel trashrack; multiple main duty pumps and a single light-duty pump; housing facility to protect the pumps; discharge pipes to the Calaveras River and outfall structure; electrical and controls; domestic water service; all-weather road surfacing; fencing; and rerouting of existing storm drain utilities into new sump. Final acceptance of the new pump station by RD 1614 will not be made until all work has been satisfactorily completed, the facility tested for proper operation, and all final submittals (e.g. as-built drawings, O&M manuals, warranties, etc.) have been received.

Figure 4 presents a preliminary schedule for the Wisconsin Pump Station Replacement Project.

**Figure 4. Preliminary Project Schedule**

Task/Activity	2012				2013				2014				2015				2016				2017				
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>FUNDING PROCUREMENT:</b>																									
Prop 1E Stormwater Flood Management Grant	[Yellow]																								
Application Due Date		0																							
Prop 218 Assessment District	[Yellow]																								
Ballot Tabulation				0																					
<b>PLANNING &amp; DESIGN:</b>																									
Environmental / CEQA Documentation	[Yellow]																								
Permitting																									
* Surveying, Mapping and Utility Research																									
* Improvement Plans, 30%																									
Geotechnical Investigation																									
Improvement Plans and Specs, 100%																									
<b>CONSTRUCTION:</b>																									
Bidding Process																									
Notice to Proceed																									
Mobilization / Site Preparation																									
Project Construction																									
Performance Testing / Demobilization																									
Notice of Completion																									
Project Closeout																									

- Notes:
1. This project schedule is preliminary and subject to change.
  2. Items marked with "\*" have already been completed.

## Cost Estimate

Table 1 presents a summary of the Opinion of Probable Costs for the Wisconsin Pump Station Replacement Project, based on the current 30% design drawings. The estimate includes a 20% contingency to account for unforeseen costs. Note that these estimated costs are based on 2012 dollars.

**Table 1. Opinion of Probable Costs**

Item	Description	Total Cost
<b>Construction</b>		
1.	General Requirements	\$167,000
2.	Sitework	\$367,400
3.	Concrete	\$118,300
4.	Masonry	\$43,700
5.	Metals	\$64,700
6.	Doors and Windows	\$10,600
7.	Finishes	\$8,500
8.	Specialties	\$600
9.	Equipment	\$363,000
10.	Special Construction	\$5,300
11.	Mechanical	\$159,600
12.	Electrical	\$285,000
		<b>\$1,593,700</b>
<b>Planning, Engineering &amp; Management</b>		
1.	Project Management and Coordination	\$47,900
2.	Environmental Assessment, CEQA Compliance, and Permitting	\$25,000
3.	Surveying	\$16,000
4.	Engineering, Plans, and Specs	\$95,700
5.	Bidding	\$8,000
6.	Construction Management and Inspection	\$127,500
7.	Geotechnical, Design	\$8,000
8.	Geotechnical, Construction	\$39,900
		<b>\$368,000</b>
	Subtotal:	\$1,961,700
	20% Contingency:	\$392,400
	<b>Total:</b>	<b>\$2,354,100</b>