Project Status Update
Presentation

Feasibility Study for Dry Creek Bypass Pipeline Project

Sonoma County Water Agency
HDR
In collaboration with
Kennedy Jenks

May 2010
Presentation Agenda

- Project Overview
- Alternatives Evaluation
  - Inlet
  - Pipeline Alignment
  - Outlet
- Preferred Alternative
Project Need

- Biological Opinion limits flow in Dry Creek during high water demand periods
- Bypass pipeline would convey flows that cannot be sustainably managed in Dry Creek
Project Objectives

- Identify the Most Advantageous Project
  - Inlet
  - Pipeline Alignment
  - Outlet
- Define Project, Permitting, and Regulatory Requirements
- Define Capital and Operating Costs
Screening and Evaluation Process

### Inlet Options
- Headbox at Stilling Basin
- Siphon over Dam
- New Works at Left Abutment
- Tie to Existing Control Tower

### Pipeline Routes
- Northern
- Central
- Southern

### Outlet Options
- Dry Creek
- Russian River

**Screening**

**Complete alternatives of Inlet, Route, and Outlets**

**Evaluation Criteria**

**Evaluation**

**Ranked alternatives of Inlet, Route, and Outlets**
Inlet Options

- **Stand Alone Facilities**
  - New outlet facility through left abutment
  - New head bay adjacent to existing stilling basin
  - Siphon system over dam

- **Integrated Facilities**
  - New tunnel/pipeline tapping into existing wet well
## Inlet Screening

<table>
<thead>
<tr>
<th>Option</th>
<th>Design &amp; Construction</th>
<th>Facility Operability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Box Adjacent to Stilling basin</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Siphon Over Existing Dam</td>
<td>Unacceptable</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>New Tunnel Through Left Abutment</td>
<td>Conditionally Unacceptable</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Integrated Facility</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>
Route Options

- **Northern**
  - Canyon Rd
- **Central**
  - Dry Creek Rd
  - W. Dry Creek Rd
  - Paralleling Dry Creek
- **Southern**
  - Westside Rd
Route Screening & Outlet Sites

Legend
- Inlet
- Pipe Termination Nodes

Northern Routes
- Canyon Rd
- Dutcher Creek
- Direct A
- Direct B

Central Routes
- Dry Creek Road
- East DC Access Road
- West DC Access Road
- West Dry Creek Road
- East Shared
- West Shared

Southern Routes
- Southern Route

NOTE: × × × × indicates screened-out segments
Outlet Facility Options

Riverbank Outfalls
- Rip-Rap Channel
- Concrete Chute
- Screened Outfall

Diffusers
- In-River Diffuser
- Bridge Pier
- Radial Injection Well In-Bed or In-Bank
## Outfall Type Screening

<table>
<thead>
<tr>
<th>Outlet Facility</th>
<th>Engineering Criteria</th>
<th>Fisheries Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Riverbank Outfalls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riprap River Riverbank Outfall</td>
<td>Excellent</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Concrete Chute Riverbank Outfall</td>
<td>Excellent</td>
<td>Poor</td>
</tr>
<tr>
<td>Screened</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>In-River Diffusers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical In-River Diffuser Install</td>
<td>Satisfactory</td>
<td>Poor</td>
</tr>
<tr>
<td>Microtunnel In-River Diffuser Install</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Bridge Pier In-River Diffuser Install</td>
<td>Satisfactory</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>In-Bed Diffusers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without Engineered Backfill</td>
<td>Poor</td>
<td>Excellent</td>
</tr>
<tr>
<td>With Engineered Backfill</td>
<td>Poor</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>In-Bank Diffusers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical In-Bank Diffusers Install</td>
<td>Poor</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

- **Engineering Criteria**
  - Relative Cost
  - Ease of Operation
  - Timing and Reliability
  - Ease of Construction
  - Capacity
  - Water Quality Impact
  - Visual Impact

- **Fish Criteria**
  - Dissolved Oxygen
  - Temperature
  - Erosion
  - Predator Habitat
  - Bank Habitat
  - Channel Dynamics
  - Construction
Outlet Locations*

*2 other locations on Russian River near Geyserville
Screening and Evaluation Process

**Inlet Options**
- Headbox at Stilling Basin
- Tie to Existing Control Structure

**Pipeline Routes**
- Northern
- Central

**Outlet Options**
- Dry Creek
- Russian River

**Evaluation Criteria**

**Screening**

**Complete alternatives of Inlet, Route, and Outlets**

**Evaluation**

**Ranked alternatives of Inlet, Route, and Outlets**
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Inlet Facility</th>
<th>Pipeline Route</th>
<th>Outlet Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Reliability</td>
<td>Reliability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Constructability</td>
<td>Constructability</td>
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<td>Constructability</td>
<td>Permitting</td>
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<tr>
<td>Permitting</td>
<td>Operations</td>
<td>Operations</td>
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<tr>
<td>Operations</td>
<td>Right of Way Acquisition</td>
<td>Right of Way Acquisition</td>
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<tr>
<td>Right of Way Acquisition</td>
<td>Liquefaction Potential</td>
<td>Liquefaction Potential</td>
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<tr>
<td>Liquefaction Potential</td>
<td>Hydropower Potential</td>
<td>River Channel Stability</td>
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<tr>
<td>Hydropower Potential</td>
<td>Special Crossings</td>
<td>Accessibility</td>
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<tr>
<td>Special Crossings</td>
<td>Environmental</td>
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</tr>
<tr>
<td>Wetlands</td>
<td>Wetlands</td>
<td>Wetlands</td>
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<tr>
<td>Habitats and Sensitive Species</td>
<td>Habitats and Sensitive Species</td>
<td>Habitats and Sensitive Species</td>
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<tr>
<td>Hazardous materials</td>
<td>Hazardous materials</td>
<td>Hazardous materials</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>Cultural Resources</td>
<td>Cultural Resources</td>
</tr>
<tr>
<td>Impact to trees (roots)</td>
<td>Water Quality/Fisheries</td>
<td></td>
</tr>
</tbody>
</table>
Preferred Alternative

- Inlet – Headbox at Existing Stilling Basin
  - Cost is significantly less than Integrated Facility
- Pipeline Alignment – Dry Creek Road with Microtunnels
  - Constructability and Tree Loss
  - Right of Way Acquisition
  - Less Riparian Disruption
- Outlet Location – Adjacent to Highway 101 Bridge at the Russian River
  - River Channel Stability
  - Operations
## Opinion of Estimated Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost ($ Millions)*</th>
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<tbody>
<tr>
<td>Inlet</td>
<td>2.58</td>
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<tr>
<td>Pipeline</td>
<td>61.54</td>
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<tr>
<td>Outlet</td>
<td>4.09</td>
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<tr>
<td>Construction Markups</td>
<td>38.72</td>
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<tr>
<td><strong>Construction Cost</strong></td>
<td><strong>106.84</strong></td>
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<tr>
<td>Environmental</td>
<td>3.55</td>
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<tr>
<td>ROW</td>
<td>1.22</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>111.61</strong></td>
</tr>
<tr>
<td>Engineering (10%)</td>
<td>10.68</td>
</tr>
<tr>
<td>Construction Legal (5%)</td>
<td>5.34</td>
</tr>
<tr>
<td>Construction Admin (8%)</td>
<td>8.55</td>
</tr>
<tr>
<td>Owner Admin (5%)</td>
<td>5.34</td>
</tr>
<tr>
<td><strong>Total Project Cost</strong></td>
<td><strong>141.52</strong></td>
</tr>
</tbody>
</table>

*Cost is based on construction of a 72-inch bypass pipeline and associated facilities.*
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