Baldwin Lake Sediment Investigation

Robert Kurkjian and Oliver Galang

The Arboretum

Los Angeles County Arboretum & Botanic Garden
Results of Sediment Investigation

Los Angeles County Arboretum and Botanic Garden
Figure 4: Baldwin Lake Vicinity Plan
From Korrandolf 2012
Brief History of the Arboretum

• Lake site was depression along the fault Raymond

• In 1875, Lucky Baldwin acquired the land

• Developed the lake and surroundings

• Late 1880s, lake deepened to approx. 15 feet

• In 1947, Arboretum was created

• In 1950s, County constructed stormwater system
  - Collection system discharges to Tule Pond
  - Lake outlet discharges into Arcadia Wash
Sediment Sampling Locations

Source: Department of Parks and Recreation
<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Water Column (ft)</th>
<th>Core length (ft)</th>
<th>Sediment Recovery (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-SED1</td>
<td>2.0</td>
<td>6.3</td>
<td>6.0</td>
</tr>
<tr>
<td>BL-SED2</td>
<td>1.8</td>
<td>13.0</td>
<td>10.9</td>
</tr>
<tr>
<td>BL-SED3</td>
<td>2.0</td>
<td>12.0</td>
<td>11.3</td>
</tr>
<tr>
<td>BL-SED4</td>
<td>1.9</td>
<td>15.7</td>
<td>13.6</td>
</tr>
<tr>
<td>BL-SED5</td>
<td>1.9</td>
<td>15.6</td>
<td>15.0</td>
</tr>
<tr>
<td>TP-SED1</td>
<td>1.3</td>
<td>3.9</td>
<td>2.8</td>
</tr>
<tr>
<td>TP-SED2</td>
<td>3.1</td>
<td>5.5</td>
<td>3.6</td>
</tr>
</tbody>
</table>
### Sediment Sampling Results

<table>
<thead>
<tr>
<th></th>
<th>Metals</th>
<th>TPH (C8-C40)</th>
<th>PAHs</th>
<th>PCBs</th>
<th>Pesticides</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baldwin Lake</strong></td>
<td>Elevated Pb and Cr</td>
<td>ND</td>
<td>Low levels</td>
<td>ND</td>
<td>Low levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tule Pond</strong></td>
<td>Elevated Pb (CA hazardous) and Cr</td>
<td>880 mg/kg</td>
<td>Exceeded USEPA residential levels</td>
<td>Low level</td>
<td>Low levels</td>
</tr>
</tbody>
</table>
Findings

• Baldwin Lake
  ▪ Chemical characterization- suitable for beneficial reuse
  ▪ Clay layer present- eastern portion of lake

• Tule Pond
  ▪ Hazardous levels of lead
    – If dredged, must be disposed of as hazardous waste
  ▪ Highest levels of contaminants detected near stormwater inputs (upstream)

• Samples archived
Dredging Approach

• Baldwin Lake
  ▪ 6 feet (maintainence): 38,000 CY
  ▪ 15 feet (historical): 95,000 CY
  ▪ Determine dredging technique- cost, environmental impacts
  ▪ Dewater sediment
  ▪ Monitor water quality

• Tule Pond
  ▪ Delineate sediment impacts prior to dredging
  ▪ Sample dredged spoils
  ▪ Determine volumes for disposal and/or reuse
  ▪ Evaluate engineering approach for stormwater
Preliminary Concepts for the Arboretum

Oliver Galang, PE ENV SP
Baldwin Lake Drainage Area

Source: Upper San Gabriel EWMP

Land Use:
- Agriculture (20%)
- Commercial (2%)
- SF Residential (75%)
- Transportation (3%)

Arboretum of Los Angeles County
- Catchment Size: 207 acres
- Soil Type: 003 - Chino Silt Loam
- Parcel Required for Mitigation: 1 acres

0 250 500 1,000 Feet
LACFCD Maintenance Responsibilities
Potential Funding Programs
Caltrans Stormwater Compliance Units

• Currently developing criteria based on Priority Reaches
• Preference for Larger Projects to fund in a multi-year program
• Stormwater, Infiltration or Use Opportunities
• Caltrans funded-projects to date:
  ▪ Lakewood Stormwater Capture
  ▪ Skylinks Golf Course Regional BMP
### State Water Resources Control Board

#### PROPOSITION 1 PROGRAM

<table>
<thead>
<tr>
<th>Eligible Applicants:</th>
<th>Public agencies, nonprofit organizations, public utilities, federally recognized Indian tribes, state Indian tribes listed on Native American Heritage Commission's California Tribal Consultation List, and mutual water companies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible Project Types:</td>
<td>Implementation - Multibenefit storm water management projects which may include, but shall not be limited to, green infrastructure, rainwater and storm water capture projects and storm water treatment facilities. Planning - Development of Storm Water Resource Plans to meet the requirements of Water Code section 10562 and related State Water Board guidelines.</td>
</tr>
<tr>
<td>Funding Available:</td>
<td>$200 million.</td>
</tr>
<tr>
<td>Funding Source:</td>
<td>Proposition 1</td>
</tr>
<tr>
<td>Loans or Grants:</td>
<td>Grants</td>
</tr>
<tr>
<td>Applications:</td>
<td>Tentative January 2016</td>
</tr>
</tbody>
</table>
The purpose of Proposition 1 is to provide funding for projects that implement the three objectives:

- more reliable water supplies
- restoration of important species and habitat
- more resilient and sustainably managed water infrastructure

Chapter 6 of Proposition 1 allocates $30 million to the RMC for competitive grants for multi-benefit ecosystem, watershed protection and restoration projects in accordance with statewide priorities.
Example Projects
Penmar Water Quality Improvements, Phase 1

- Stormwater Diversion and Pump Station
- 2.75 MG Reservoir
- Pump Station

[Map Image with locations marked]
Echo Park Lake Rehabilitation Project

- POROUS PAVEMENT AND SWALES
- HYDRODYNAMIC SEPARATORS
- RAIN GARDEN
- WETLANDS
Discussion