

# FOURTH ANNUAL MONITORING REPORT

QUAIL HOLLOW BRIDGE REPLACEMENT PROJECT  
ALUM ROCK PARK, SAN JOSE, CALIFORNIA

Submitted to:

Marybeth Harasz  
City of San Jose - Parks, Recreation and Neighborhood Services  
Community Facilities Development Division  
200 E. Santa Clara Street  
San Jose, California 95113

Prepared by:

LSA Associates, Inc.  
157 Park Place  
Point Richmond, California 94801  
(510) 236-6810

LSA Project No. SJO0607B

LSA

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## 1.0 PROJECT OVERVIEW

This report details the second and third year of annual monitoring of mitigation plantings and in-stream wetlands for the Quail Hollow Bridge Replacement project. Annual monitoring of the mitigation site fulfills the requirements of the following permits obtained for the project:

- Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S)
- Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw); Site No. 02-43-C0423)
- California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

The project is located in Alum Rock Park in southeastern San Jose at the base of the eastern foothills of the Santa Clara Valley and the Diablo Mountain Range approximately 0.8 mile from the park entrance along Penitencia Creek Road (Figure 1, Appendix A). The project site is adjacent to the Quail Hollow Picnic Area and parking lot. It includes the Quail Hollow Bridge and the Upper Penitencia Creek channel and banks approximately 400 feet up and downstream from the bridge (Figure 2, Appendix A).

The 2004 bridge project consisted of replacing a failing, concrete low water crossing with a pre-fabricated, single-span pedestrian bridge over Upper Penitencia Creek at Quail Hollow in Alum Rock Park that was eroding the streambank and creating a barrier to fish passage. The work included removing the concrete footings and four 36-inch culverts, re-contouring approximately 150 feet of channel along the creek, and installing four rock weirs to provide grade controls and create step pools as habitat for aquatic species such as steelhead (*Oncorhynchus mykiss*) Central California Coast Evolutionary Significant Unit (ESU) and California red-legged frog (red-legged frog) (*Rana draytonii*). The weirs were subsequently modified in the summer of 2005 to meet the design objectives. The project permanently impacted approximately 150 linear feet of creek bank and a surface area of 7,500 square feet (0.17 acre). Seven willows (*Salix* sp.) and one California sycamore (*Platanus racemosa*) were removed during construction. Permanent impacts to the creek and riparian habitat are expected to improve the habitat and stability of the creek. Temporary impacts associated with stream flow diversion consisted of 225 linear feet of the creek and a surface area of 0.04 acre.

Compensatory mitigation for these impacts specified the establishment of 9,000 square feet (0.2 acre) of native riparian woodland vegetation in the project area by the end of the five year monitoring period. Approximately 1,660 square feet of that riparian vegetation needs to provide shade for the creek (Shaded Riverine Aquatic habitat). The revegetation plans specified planting 64 native container shrubs and trees and 89 willow poles and seeding disturbed areas with a non-invasive erosion control seed mix. In-stream wetlands that were disturbed during the project construction also need to become naturally reestablished in the project area.

In June of 2005, Central Coast Wilds (CCW) installed the irrigation system at the project site. In October 2005, CCW installed the mitigation plantings in the project area according to the project revegetation plans. Since then CCW has maintained the plantings and irrigation system in conformance with the mitigation monitoring requirements. During site visits conducted on November

5 and 11, 2009, LSA Associates, Inc. (LSA) botanist Michele Lee evaluated the success of the riparian plantings and determined the survival rates of individual species for the year 4 annual vegetation monitoring. On June 2, 2009, LSA biologist Dan Sidle and botanist Michele Lee conducted the year 4 geomorphology monitoring. The vegetation and geomorphology monitoring results are described in more detail in Section 4.

## 2.0 RESPONSIBLE PARTIES

### Monitoring and Reporting

#### **LSA Associates, Inc.**

157 Park Place  
Point Richmond, CA 94801  
(510) 236-6810  
(510) 236-3480 (fax)  
michele.lee@lsa-assoc.com

Michele Lee, Senior Botanist/Ecologist  
Steve Foreman, Principal/Biologist  
Dan Sidle, Biologist

### Landscape Maintenance

#### **Central Coast Wilds**

125 Walk Circle  
Santa Cruz, CA 95060  
(831) 459-0656  
jtfodor@ecologicalconcerns.com

Joshua Fodor, Project Principal  
John Cairns, Project Manager

### Permittee

#### **City of San Jose**

#### **Community Facilities Development Division Parks, Recreation and Neighborhood Services**

200 E. Santa Clara Street  
San Jose, CA 95113  
(408) 793-4183  
MaryBeth.Harasz @sanjoseca.gov

Marybeth Harasz, Associate Landscape Architect  
Mike McClintock, Parks Facility Supervisor

### 3.0 MONITORING REQUIREMENTS AND PERFORMANCE CRITERIA

The agency permits obtained for the Quail Hollow Bridge Replacement project specify performance criteria for measuring the success of the mitigation plantings and the establishment of in-stream wetlands. Regulatory Permits that were required to complete the bridge replacement project included:

- Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S).
- Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw) Site No. 02-43-C0423).
- California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

Environmental documents that provide guidelines for the mitigation and monitoring phase of the project include:

- Mitigated Negative Declaration, Quail Hollow Bridge Replacement Project, September 23, 2002 (File Number PP02-09-235).
- Alum Rock Park Riparian Management Plan (Biotic Resources Group 2001).

A summary of performance measures and maintenance requirements contained in these permits and environmental documents follows. The site is to be monitored annually for compliance with these performance measures during the first five years following project implementation.

**Performance Measure 1: Riparian Plant Survival.** The required survival rate for the first three years of post-construction monitoring is 80 percent for container stock plantings of trees and shrubs, and 60 percent for willow (*Salix* spp.) poles. The revegetation plans specify planting 64 container plants and 89 willow poles. An 80 percent survival rate for 64 container plants is 52 plants. A 60 percent survival rate for 89 willows is 54 willows. If this criterion is not met, dead plants should be replaced in kind unless the site is not conducive to the survival of a particular species, then an alternative native riparian species may be planted. Replacement plants should be installed within one year of the survival rates falling below the numbers as described above. Plant materials should be collected locally from Alum Rock Park. Replacement plants need to be monitored for five years from the date of replanting.

By year 5, the survival rate for all the plantings should be 80 percent (123 plants). If this is not achieved by year 5, replanting and monitoring will be conducted until the 80 percent success rate is achieved.

*Monitoring Parameters: Plant Mortality Counts.* The mortality of any planted trees and shrubs will be recorded during regular maintenance activities and annual monitoring will include a count of all trees and shrubs by species.

**Performance Measure 2: Riparian Plant Cover.** The cover of the planted trees and shrubs should be 70 percent after three years and 75 percent after five years according to the California Department

of Fish and Game Streambed Alteration Notification permit. In addition, according to the *Alum Rock Park Riparian Management Plan* (Biotic Resources Group 2001), by year 5, native trees should provide a total cover of at least 25 percent of the site and native shrubs should provide a total cover of at least 20 percent of the site. The revegetation plans for the mitigation area estimate that the 64 container plants and 89 willows will provide approximately 9,000 square feet (0.2 acre) of riparian vegetation by year 5. By year 5, approximately 1,660 square feet of that riparian vegetation will provide shade for the creek (Shaded Riverine Aquatic habitat). If the plantings do not provide 1,660 square feet of shade cover by year 5, additional plants need to be installed.

Monitoring Parameters: Cover Estimates. The total absolute cover of the plantings will be visually estimated to the nearest five percent and reported annually. Cover will be estimated for the entire project area and each of the four quadrants in the project area. The cover estimates will also provide data for the total square feet of riparian vegetation in the project area. The square feet of riparian vegetation overhanging the creek channel (Shaded Riverine Aquatic habitat) will also be visually estimated each year.

**Performance Measure 3: Riparian Plant Height.** The heights of the planted trees and shrubs should be monitored and reported annually. By year 5 the heights of the some tree species should attain the heights specified in Table 12 of the Alum Rock Park Riparian Management Plan (Biotic Resources Group 2001). Valley oak (*Quercus lobata*) should be at least 6 feet tall by year 5. California sycamore (*Platanus racemosa*) and willows (*Salix* spp.) should be at least 10 feet by year 5. Mexican elderberry should be a least eight feet tall by year 5.

Monitoring Parameters: Height Measurements. The height of the planted trees and shrubs will be measured and recorded annually to the nearest inch. When the planting become more established in subsequent years, heights may be estimated to the nearest half foot.

**Performance Measure 4: Weed Control.** The cover of invasive weeds should be maintained at less than 10 percent, except for periwinkle (*Vinca major*), which can have a cover of 25 percent due to its vigorous growth and difficulty in eradicating it. All invasive plants removed from the site should be bagged and disposed of off-site. By year 5, the height of weeds in the basins of planted trees and shrubs should be less than six inches.

Monitoring Parameters: Weed Removal. Regular maintenance of the mitigation plantings includes the inspection and weeding of the planting basins and the mitigation site. Annual monitoring will also include a visual estimate of the cover of invasive weeds on the site.

**Performance Measure 5: Instream Wetland Vegetation Establishment.** The instream wetlands that were impacted by the project should naturally reestablish following construction. If these wetlands do not reestablish after two years, in-kind mitigation will be implemented at a 1:1 ratio for an area covering 100 square feet.

Monitoring Parameters: Vegetation Cover. The square feet of instream wetlands will be visually estimated within each quadrant of the project area. Notes on the dominant and associated plant species will be recorded.

**Performance Measure 6: Geomorphic Stability of Channel.** The geomorphic stability of the channel should be evaluated annually and include a survey of the thalweg over the project reach and

three cross sections; evaluation of the rock weirs and fish passage; and assessment of sedimentation, erosion and scouring.

*Monitoring Parameters: Geomorphology Monitoring.* A qualified geomorphologist will conduct a geomorphic assessment of the channel, and survey at least three cross-sections and a longitudinal profile and evaluate the stability of the channel and weirs.

**Performance Measure 7: Photographic Documentation.** Baseline photographs will be taken from a minimum of four permanent photo points. Additional photographs will continue to be taken during routine monitoring from the same vantage point to record any changes to the site conditions and bank conditions immediately upstream and downstream of the site.

*Monitoring Parameters: Photographic Monitoring.* Photographs will be taken annually at five permanent photo points from the same direction to document the changes over time.

## 4.0 RESULTS

### 4.1 MONITORING

The fourth year (year 4) of geomorphology monitoring was conducted by LSA staff members Michele Lee and Dan Sidle on June 2, 2009. The fourth year (year 4) of monitoring of the mitigation plantings was conducted by Michele Lee, on November 5 and 11, 2009. The results are evaluated in the following section to determine if the site meets each performance measure.

**Performance Measure 1: Riparian Plant Survival.** Based on the year 4 monitoring results, the container plants and willows meet the performance criteria for the first three years after planting and the fifth year after planting.

Table 1 summarizes the container plant survival counts for the past four monitoring years (year 1 through year 4). The survival of container plants has met the performance criterion in all four monitoring years. An 80 percent survival rate for 64 container plants is 52 plants and the survival rate has been 100 percent or higher in all four monitoring years.

**Table 1: Summary of Container Plant Survival Counts for Year 1 through Year 4**

Plant Species	Number Specified in Planting Plans	Number Alive Year 1	Number Alive Year 2	Number Alive Year 3	Number Alive Year 4
<i>Aesculus californica</i> California buckeye	2	2	2	2	2
<i>Artemisia douglasiana</i> mugwort	12	9	9	12	12
<i>Platanus racemosa</i> California sycamore	4	4	4	4	4
* <i>Quercus agrifolia</i> coast live oak	0	1	1	1	1
<i>Quercus lobata</i> valley oak	2	2	2	2	2
<i>Ribes californica</i> hillside gooseberry	5	5	5	5	5
<i>Rosa californica</i> California rose	12	12	12	12	12
<i>Rubus ursinus</i> California blackberry	20	23	23	23	22
<i>Sambucus mexicana</i> Mexican elderberry	7	6	6	6	6
<b>TOTAL</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>67</b>	<b>66</b>

**Note:** \*This coast live oak tree is a volunteer that has been irrigated and caged in a vacant California blackberry planting hole since Year 1.

The willow performance criterion requires a 60 percent survival rate (54 willows) for the first three years. This survival criterion was not met in year 1 or year 2, and additional willow and poles were replanted. On February 5 and 6, 2007 CCW installed 83 willow poles. On January 17, 2008, CCW installed 23 red willow (*Salix laevigata*) poles and 44 arroyo willow (*S. lasiolepis*) poles. In 2008 (year 3), 102 planted and volunteer willows were counted in the mitigation area. In 2009 (year 4), 145 planted and volunteer willows were counted in the mitigation area. In year 4, it was estimated that 93 of these 145 willows were volunteers and 52 willows were planted.

In addition to the 66 surviving container plants, there are two memorial shrubs and volunteer native plants in the mitigation area. In November or December 2007, a family in the local community planted a native holly-leaved cherry (*Prunus ilicifolia*) in the mitigation area as a memorial shrub and the irrigation system was extended to it. On September 19, 2009, a memorial valley oak (*Quercus lobata*) was planted in the mitigation area on the southeast bank and the irrigation system was extended to it.

In year 4, 188 volunteer native trees, shrubs and perennials (excluding willows and in-stream wetlands) were counted in the mitigation area. Over half of these volunteers are coyote brush (*Baccharis pilularis*) and mugwort (*Artemisia douglasiana*). Coyote brush is becoming well established on the mitigation site and provides significant canopy cover, especially on the northwestern bank. Other native plants included in this volunteer count are virgin's bower (*Clematis ligusticifolia*), irisleaf rush (*Juncus xiphioides*), poison oak (*Toxicodendron diversilobum*), coast live oak (*Quercus agrifolia*), tall flat sedge (*Cyperus eragrotis*), California bay (*Umbellularia californica*), California blackberry (*Rubus ursinus*), California rose (*Rosa californica*), Mexican elderberry (*Sambucus mexicana*) and toyon (*Heteromeles arbutifolia*). The volunteer count does not include California rose and California blackberry runners adjacent to plantings. Most of the California rose and California blackberry plantings in the mitigation area are reproducing by runners.

The performance criterion also requires an 80 percent survival for all plants by year 5 (123 container plants and willows). In year 4, there were 211 surviving plantings: 66 container plants and 145 willows. In addition, there were 188 native volunteer trees, shrubs and perennials (excluding willows and in-stream wetlands).

**Performance Measure 2: Riparian Plant Cover.** Cover estimates for all the riparian plantings meet the performance criteria for the third and fifth year after planting. The performance criteria that the plantings provide at least 1,660 square feet of shade for the creek (Shaded Riverine Aquatic habitat) by year 5 has not been met yet.

The revegetation plans for the site estimated that the plantings would provide approximately 9,000 square feet of vegetation by year 5. The length and width of each plant was measured during the November 2009 monitoring. The plantings and willow volunteers provide a total of approximately 2,428 square feet of vegetation. This estimate also includes runners of California rose and California blackberry but does not include volunteers.

In year 4, the cover of the riparian plantings in the project area was approximately 40 percent and was approximately 55 percent when the cover of native volunteer shrubs and trees is included. In year 4, the total vegetation cover of all native and non-native plants in the understory of the project area was approximately 90 percent: 55 percent plantings and volunteers; 30 percent existing trees, shrubs and perennials; and 5 percent annual grasses and forbs. Approximately 10 percent of the site is bare ground, leaf litter, and boulders. These cover estimates include the understory layer consisting of shrubs, small trees and herbs, and excludes the existing mature trees in the upper canopy layer and the

unvegetated creek channel. These cover estimates also include the existing trees, shrubs and perennials in the project area that were not disturbed by the project. When the 30 percent cover of existing trees, shrubs and perennials is excluded from the cover estimates and native volunteers are included, then the total cover of the riparian plantings and volunteers is 79 percent (55 percent cover divided by 70 percent cover), which exceeds the criteria of 70 percent for all riparian plantings after the third year and 75 percent after the fifth year.

In year 4, the cover of the planted trees in the project area was 25 percent and the cover of the planted shrubs was 15 percent. In addition, 15 percent cover is provided by native volunteers which are mostly shrubs. The performance criteria require 25 percent cover of the planted trees and 20 percent cover of the planted shrubs by year 5. These criteria are met when volunteer shrubs are included in the cover estimate.

In addition to the riparian plantings and volunteer shrubs, trees and perennials previously described, vegetation in the understory of the project area consists of native and non-native grasses and forbs. Native forbs in the understory include California poppy (*Eschscholzia californica*), horsetail (*Equisetum* sp.), and willow herb (*Epilobium ciliatum*). Non-native grasses include smilo (*Piptatherum miliaceum*), wild oat (*Avena* sp.), Italian ryegrass (*Lolium multiflorum*), red brome (*Bromus madritensis*), and rabbitsfoot grass (*Polypogon monspeliensis*). Non-native forbs include curly dock (*Rumex crispus*), fumitory (*Fumaria* sp.), prickly lettuce (*Lactuca serriola*), and cut-leaved geranium (*Geranium dissectum*). Periwinkle (*Vinca major*), poison hemlock, black mustard, and Bermuda buttercup (*Oxalis pes-caprae*) are invasive weeds that occur on the site.

The performance criteria that the plantings provide at least 1,660 square feet of shade for the creek (Shaded Riverine Aquatic habitat) (SRAH) by year 5 has not been met yet. By year 4, the plantings and volunteers provided approximately 1,211 square feet of SRAH. Most of the SRAH is provided by willows below the ordinary high water mark (OHWM) and a Mexican elderberry and willows just above the OHWM. Other riparian plantings above the OHWM could also provide shade over the creek channel depending on the position of the sun and these plants should potentially be considered during the year 5 monitoring.

**Performance Measure 3: Riparian Plant Height.** Table 2 provides a summary of the average plant height for each species from year 1 through year 4. Most of the planting were in good condition except for some of the willows in year 2. There has been very low mortality in the container plants and overall the heights of the riparian plantings have increased each year. However, the height requirements specified in the performance criteria for year 5 are unlikely to be reached by most of the plantings by year 5 (Table 2).

**Performance Measure 4: Weed Control.** The mitigation site met the criteria for weed control in year 4.

**Table 2: Summary of Average Plant Heights for Year 1 through Year 4**

<b>Plant Species</b>	<b>Average Height (feet) Year 1</b>	<b>Average Height (feet) Year 2</b>	<b>Average Height (feet) Year 3</b>	<b>Average Height (feet) Year 4</b>	<b>Height (feet) Required by Year 5*</b>
<i>Aesculus californica</i> California buckeye	0.6	1.0	1.0	1.3	none
<i>Artemisia douglasiana</i> mugwort	1.9	1.5	1.9	1.3	none
<i>Platanus racemosa</i> California sycamore	2.2	2.7	3.5	4.1	10.0
<i>Quercus agrifolia</i> coast live oak	0.2	0.3	0.7	1.0	none
<i>Quercus lobata</i> valley oak	2.2	2.5	3.7	3.6	6.0
<i>Ribes californica</i> hillside gooseberry	2.6	3.4	3.6	3.9	none
<i>Rosa californica</i> California rose	2.6	3.3	3.7	4.1	none
<i>Rubus ursinus</i> California blackberry	0.6	1.3	1.4	1.6	none
<i>Salix lasiolepis/Salix laevigata</i> red willow/arroyo willow	1.8	2.4	2.8	5.1	10.0
<i>Sambucus mexicana</i> Mexican elderberry	2.0	3.6	5.1	5.9	8.0
<b>TOTAL AVERAGE</b>	<b>1.7</b>	<b>2.2</b>	<b>2.8</b>	<b>3.8</b>	

**Notes:** Average height excluded volunteers.

\*Performance Measure 3: Riparian Plant Height states that certain tree species should attain a specific height by Year 5.

Planting basins are weeded during regular maintenance once a month to remove all weed from the basins and in the winter to maintain the basins so that the maximum height of weeds is 6 inches. The maximum height of weeds in the mitigation area is also 6 inches. Weeds are mowed, hand removed, or weed-whipped.

Invasive weeds on the site include periwinkle (*Vinca major*), poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), stinkwort (*Dittrichia graveolens*), Bermuda buttercup (*Oxalis pes-caprae*), and milk thistle (*Silybum marianum*). These weeds have been periodically removed from the site as part of the routine site maintenance. The cover estimates of each of these invasive species in year 4 was below the criteria of less than 10 percent total cover for invasive weeds (other than periwinkle) and less than 30 percent cover for periwinkle. Periwinkle primarily occurs on the southeastern bank and southwestern bank. Its average cover on the site during the November 11, 2009 (year 4) monitoring was approximately 3 percent. The cover of the other invasive weeds in the mitigation area during the November 11, 2009 monitoring was approximately 2 percent.

**Performance Measure 5: Instream Wetland Vegetation Establishment.** The criterion that instream wetland become established in the mitigation area by year 2 was already met in year 2. In year 3 and year 4 the insteam vegetation was still well established and increasing in overall cover.

**Performance Measure 6: Geomorphic Stability of Channel.** Based on a visual evaluation of the site during the year 4 geomorphic monitoring, the project is performing well and meeting the design criteria. There was no excessive erosion or sedimentation in the project area. The rock weirs appear to be stable, function well through the winter flows, and provide fish passage. The depth of the step pools continues to perform well and provides aquatic habitat. During the June 2, 2009 geomorphology monitoring, juvenile steelhead and western toad (*Bufo boreas*) larvae were observed within the large pools in the project area. LSA established a permanent longitudinal profile and three permanent cross sections in the project area on June 2, 2009 (Figure 3, Appendix A and Longitudinal Profile and Cross Section Graphs, Appendix D).

**Performance Measure 7: Photographic Documentation.** Photographs for vegetation monitoring were taken on November 5, 2009 from the five permanent photo points (Vegetation Monitoring Photographs, Appendix B). Photographs for the geomorphic monitoring were taken on June 2, 2009 from similar locations as Swanson Hydrology and Geomorphology (2006) report (Geomorphology Monitoring Photographs, Appendix C). The locations of photo points are shown in Figures 2 and 3 (Appendix A).

## 4.2 MAINTENANCE ACTIVITIES

CCW conducts landscape maintenance activities at the mitigation area at least once a month.

The following maintenance activities are regular periodic activities that were conducted from November 7, 2008 through November 11, 2009. These activities will continue to be conducted for the entire five year monitoring period.

- Removal and in-kind replacement of dead plants.
- Programming irrigation controllers to respond to change of seasons and plant watering requirements and to minimize irrigation run-off.
- Inspect and test the irrigation system and make repairs.

- Verify condition of wire mesh around plantings every month and repair or replace broken ones as needed. Remove wire mesh cages as needed when plants outgrow them.
- Replacement of mulch in planting basins as needed to maintain a three inch layer of mulch.
- Removal of weeds from planting basins once a month to remove all weed from the basins. In the winter the height of the weeds in the basin is maintained to be no greater than six inches. The maximum height of weeds in the mitigation area is six inches. Weeds are mowed, hand removed, or weed-whipped.
- Removal of invasive weeds throughout the mitigation area to maintain their cover in accordance with vegetation monitoring performance criteria. Weeds are mowed, hand removed, or weed-whipped.
- Integrated pest management to control any pest infestations damaging the project area.

Additional maintenance activities performed from November 7, 2008 through November 11, 2009 included the following:

- On September 19, 2009, a valley oak tree was planted as a memorial tree in the mitigation area on the southeast bank near the other valley oak plantings and the irrigation system was extended to it. This memorial valley oak was hand watered during the October 2009 maintenance visit.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

The year 4 monitoring shows the mitigation site is performing well and meets the annual performance criteria for plant survival (measure 1), weed control (measure 4), and geomorphic stability (measure 6). The site also already meets the year 5 performance criteria for site vegetation cover, tree cover, and shrub cover. The mitigation site will likely continue to achieve the final performance criteria for these same six attributes in year 5 barring any unforeseen circumstances. The site is currently not yet attaining the year 5 performance criteria for two related criteria: Shaded Riverine Aquatic Habitat (SRAH) and tree and shrub height (measure 2 and 3, respectively).

SRAH, provided primarily by willows, increased substantially over previous years during year 4. Significantly more volunteer willows established on the site during year 4 compared to previous monitoring years. While the plantings and volunteers provided enough cover in year 4 to meet the final, year 5 overall cover requirements for the site, the site has not yet met the year 5 criteria for SRAH. There are no annual or year 4 SRAH performance criteria. The site could potentially meet the SRAH requirement by year 5. In year 3, willows and a Mexican elderberry provided 473 square feet of SRAH. In year 4, willows and a Mexican elderberry provided 1,211 square feet of SRAH. The area of SRAH increased more than 200 percent from year 3 to year 4. If the SRAH increases by at least 37 percent from year 4 to year 5, then the vegetation will provide the required 1,660 square feet of SRAH by year 5.

The year 5 tree height requirements are unlikely to be met. The tree height requirements were specified in the *Alum Rock Park Riparian Management Plan* (Biotic Resources Group, 2001). These height requirements appear to be arbitrary recommendations as the basis for the plant heights and are not cited and do not appear to be based on empirical data. The past several years have been below average in rainfall and the plantings are expected to attain the required heights over time, and subsequently provide additional SRAH, especially in normal rainfall years.

While the Quail Hollow mitigation may not fully achieve all of the final, year 5 performance criteria by the end of the next growing season, riparian vegetation has established and is reproducing on the mitigation site. Overall success should be evaluated based on the ability to establish, functional and self-reproducing riparian habitat on the site and not solely on the performance criteria, which might not be entirely appropriate for this specific site and/or based on arbitrary criteria.

### Recommendations

- Stinkwort (*Dittrichia graveolens*) is an invasive weed that has become more abundant on the site this year. Regular maintenance and weed control should focus on keeping the cover of this species very low to prevent its spread.
- Remove the thornless, non-native blackberry (*Rubus* sp.) that is growing in the California blackberry planting hole on the northeastern bank.

- Site maintenance should include pruning or removing coyote brush, or other volunteers on the site, that are displacing the riparian plantings.

## 6.0 REFERENCES

Biotic Resources Group. 2001. Alum Rock Park Riparian Management Plan. Prepared for the City of San Jose, Department of Public Works, Parks and Recreation Facilities Division. April 21, 2001.

California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S)

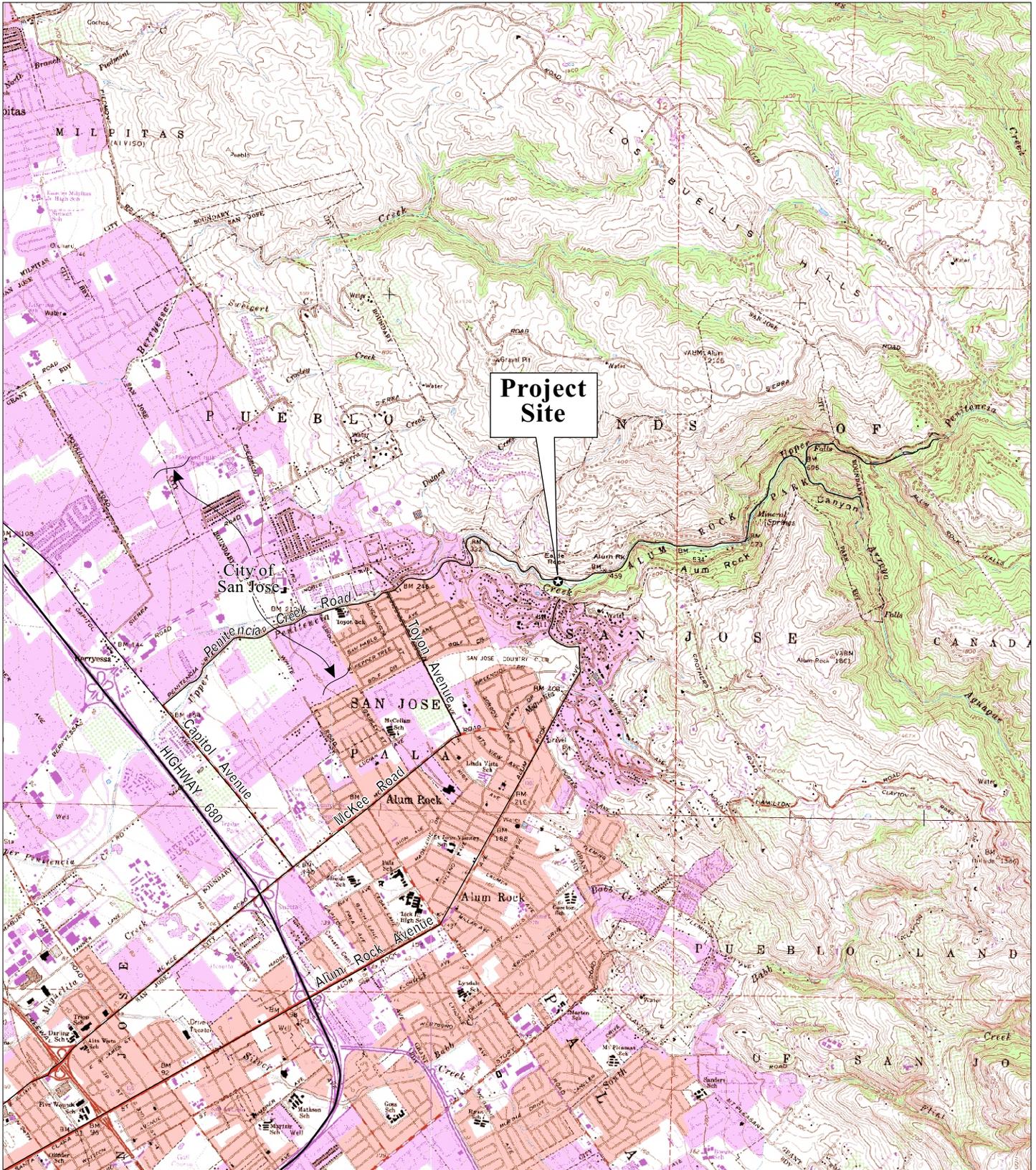
Mitigated Negative Declaration, Quail Hollow Bridge Replacement Project, September 23, 2002 (File Number PP02-09-235)

Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw); Site No. 02-43-C0423)

Swanson Hydrology and Geomorphology. 2006. *Alum Rock Park - Quail Hollow Geomorphic Monitoring – 2006 Water Year*. June 13, 2006.

# APPENDIX A

## FIGURES



**Project Site**

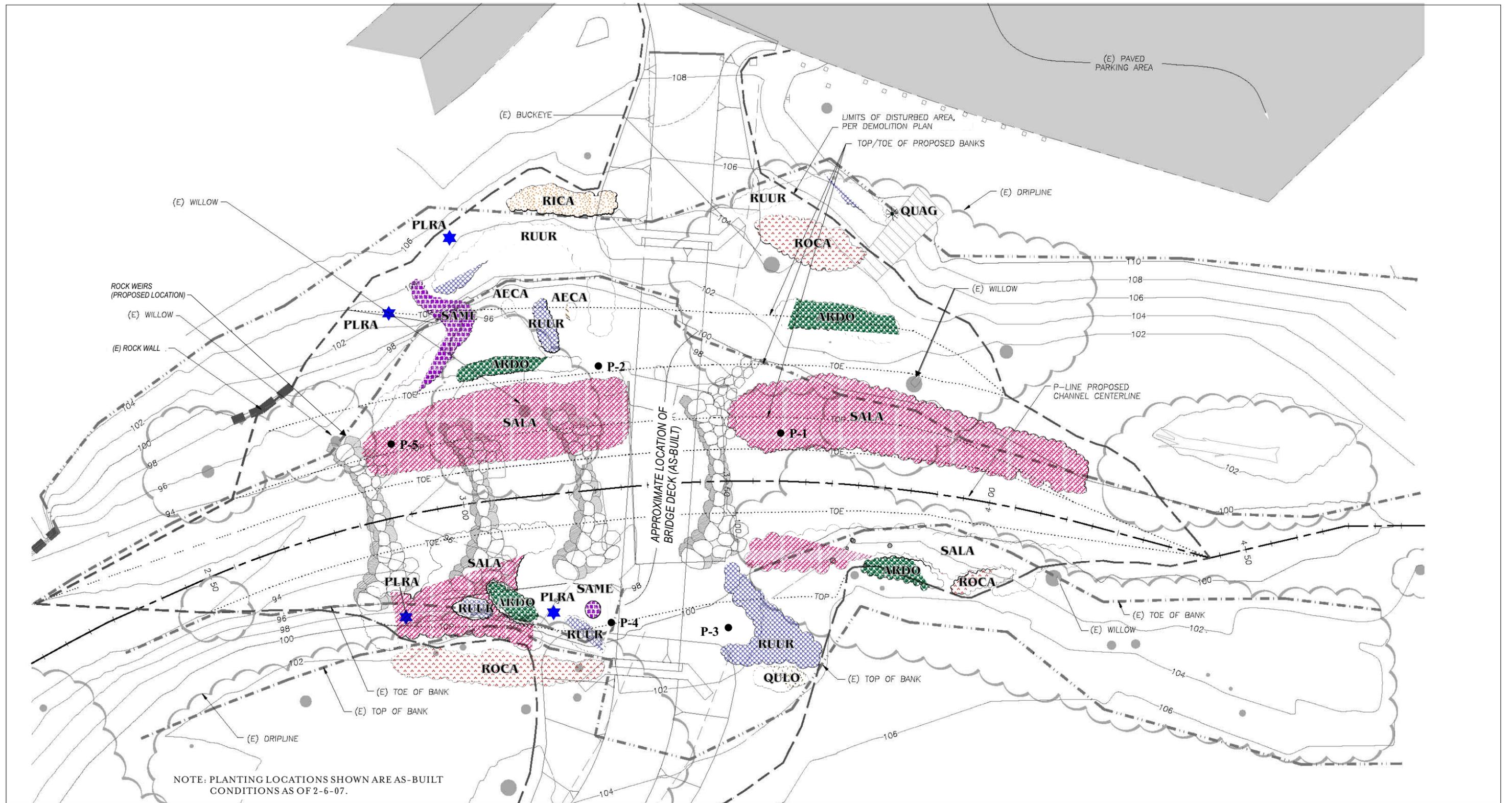
LSA



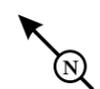
SOURCE: USGS 7.5' QUADS - CALAVERAS RESERVOIR, AND SAN JOSE EAST, CALIF.

FIGURE 1

*Quail Hollow Bridge Replacement  
Project Location*



LSA



NOT TO SCALE

**LEGEND**

- P-4 ●** PERMANENT PHOTO POINT (P-1 THROUGH P-5)
- EXISTING TREES

**PLANTINGS**

- AECA - California buckeye (*Aesculus californica*)
- ARDO - mugwort (*Artemisia douglasiana*)
- PLRA - California sycamore (*Platanus racemosa*)
- QUAG - coast live oak (*Quercus agrifolia*)
- QULO - valley oak (*Quercus lobata*)
- RICA - hillside gooseberry (*Ribes californica*)
- ROCA - California rose (*Rosa californica*)
- RUUR - California blackberry (*Rubus ursinus*)

- SALA - red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*)
- SAME - Mexican elderberry (*Sambucus mexicana*)

FIGURE 2

Quail Hollow Bridge Replacement  
Riparian Plantings

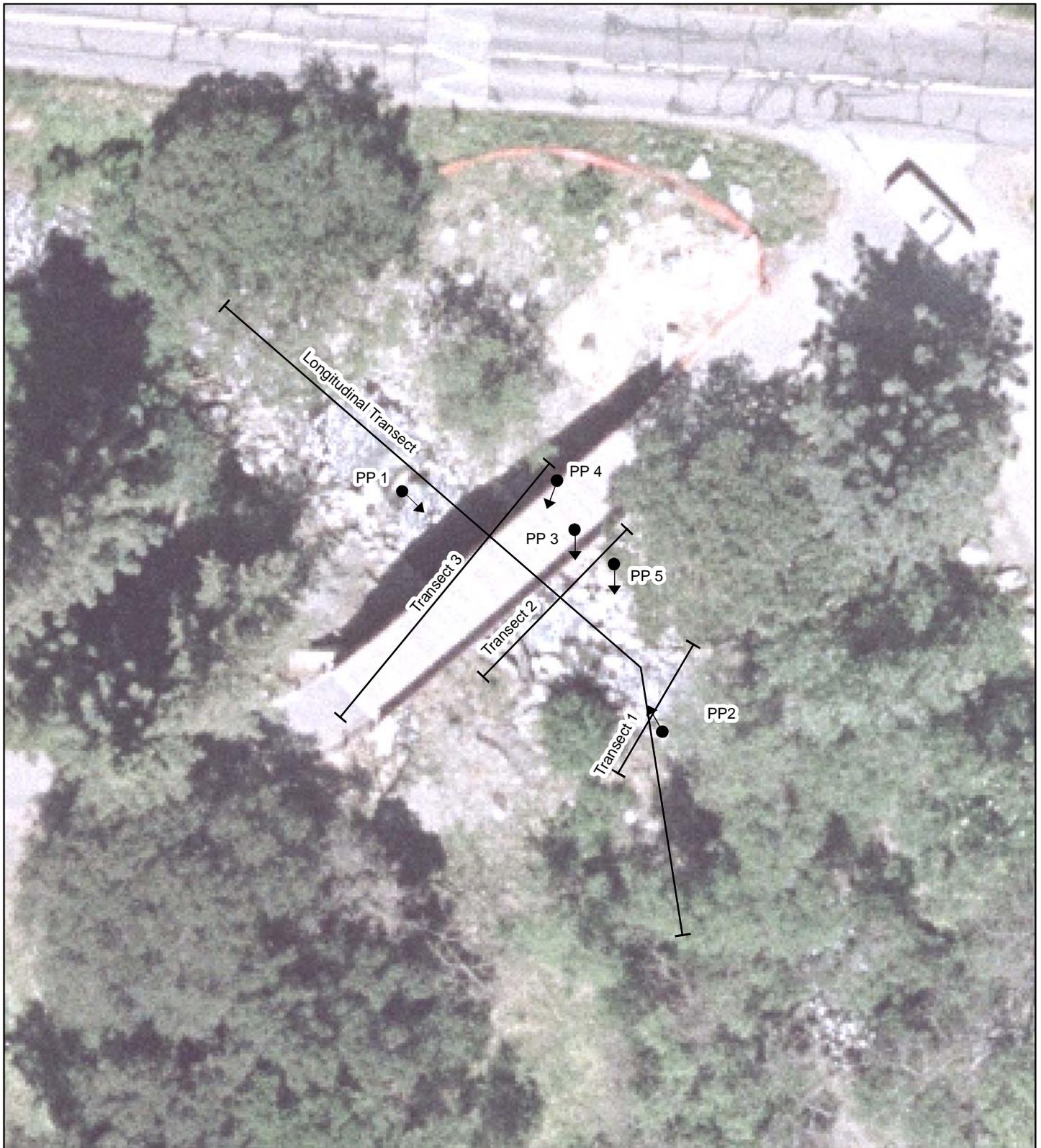
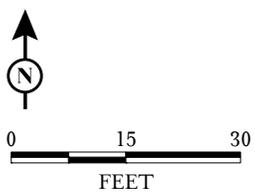


FIGURE 3



● → PHOTOPOINT  
 ┆ ┆ TRANSECT

*Quail Hollow Bridge Replacement*

Geomorphology Monitoring  
 Transects and Photo Points

## **APPENDIX B**

# **VEGETATION MONITORING PHOTOGRAPHS**



Photo Point 1: Photo taken on November 5, 2009 looking southwest at rock weirs and southwestern bank.



Photo Point 1: Photo taken on November 5, 2009 looking south at southeastern bank.

LSA

*Quail Hollow Bridge Replacement*  
Vegetation Monitoring Photographs



Photo Point 2: Photo taken on November 5, 2009 looking southwest at southwest bank.



Photo Point 3: Photo taken on November 5, 2009 looking northeast at northeastern bank.

LSA

*Quail Hollow Bridge Replacement*  
Vegetation Monitoring Photographs



Photo Point 4: Photo taken on November 5, 2009 looking northwest at northwestern bank.

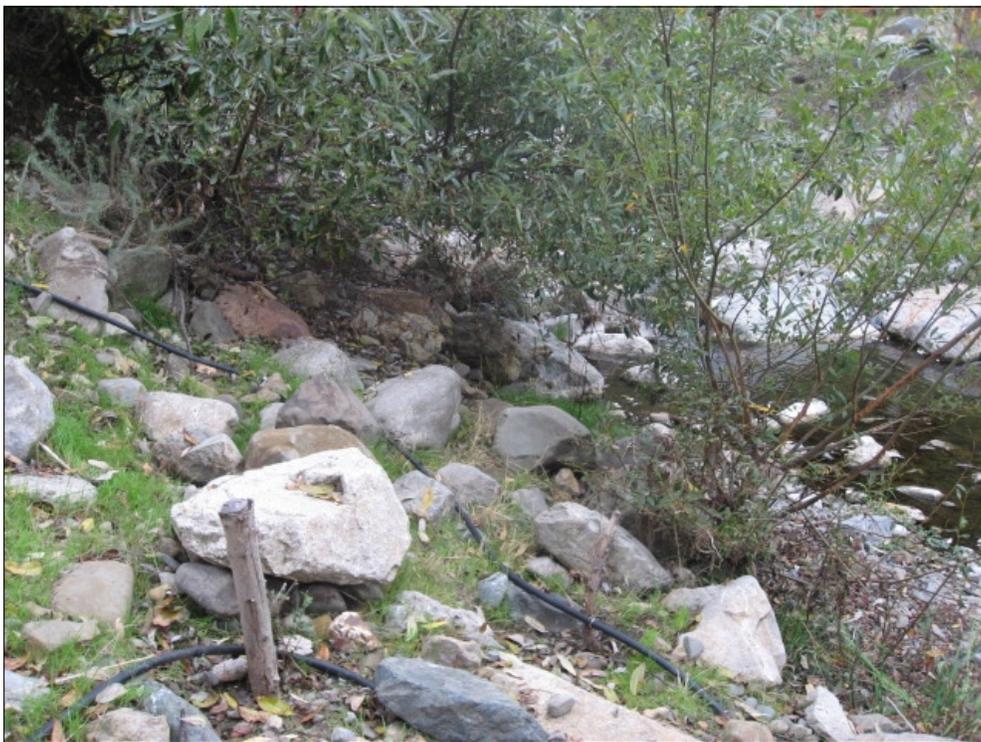


Photo Point 5: Photo taken on November 5, 2009 looking southeast at northwestern bank.

LSA

*Quail Hollow Bridge Replacement*  
Vegetation Monitoring Photographs

Note: Site Photograph at Photo Point 2 in *First Annual Monitoring Report* (LSA 2007) is inaccurate. It was taken at Photo Point 3 looking northeast at northeastern bank.

## **APPENDIX C**

# **GEOMORPHOLOGY MONITORING PHOTOGRAPHS**



Photo Point 1: Photo taken on June 2, 2009 looking southeast at rock weirs.



Photo Point 2: Photo taken on June 2, 2009 looking northwest at rock weirs.

LSA

*Quail Hollow Bridge Replacement*  
Geomorphology Monitoring Photographs



Photo Point 3: Photo taken on June 2, 2009 looking south at rock weirs and southwestern bank.



Photo Point 4: Photo taken on June 2, 2009 looking southwest at rock weirs.

LSA

*Quail Hollow Bridge Replacement*  
Geomorphology Monitoring Photographs



Photo Point 5: Photo taken on June 2, 2009 looking south at rock weir.

LSA

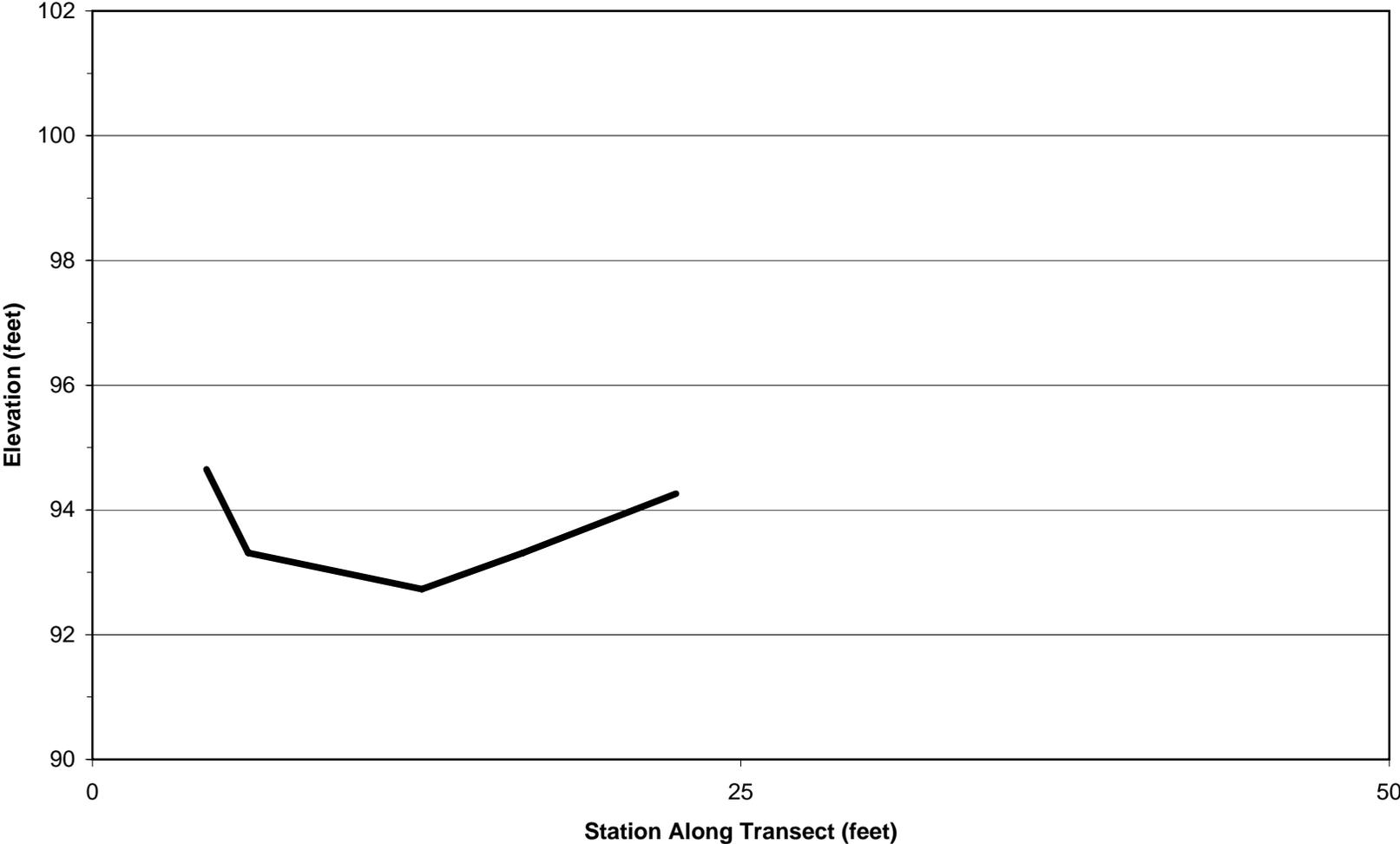
*Quail Hollow Bridge Replacement*  
Geomorphology Monitoring Photographs

**APPENDIX D**

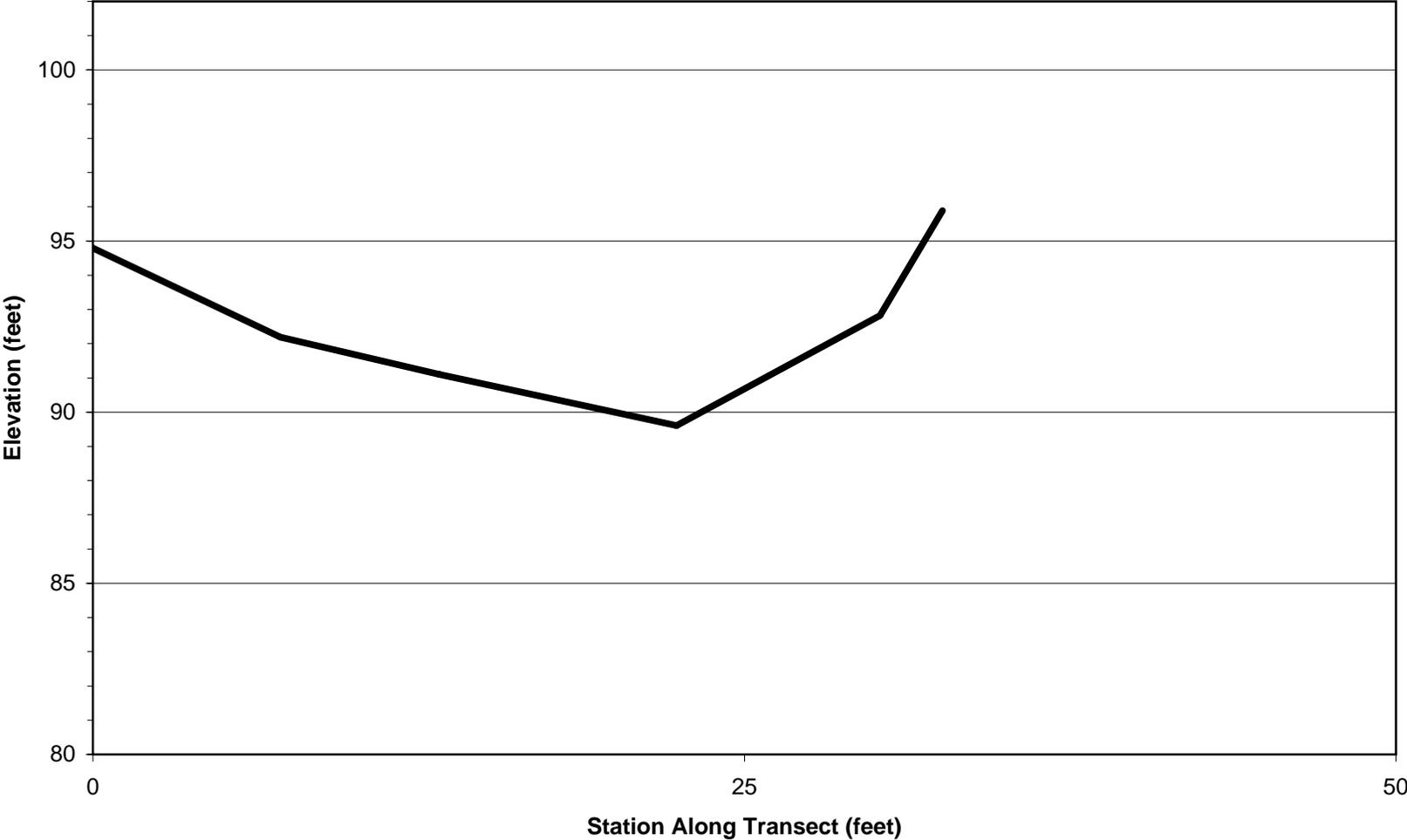
**GEOMORPHIC LONGITUDINAL PROFILE**

**AND CROSS SECTIONS**

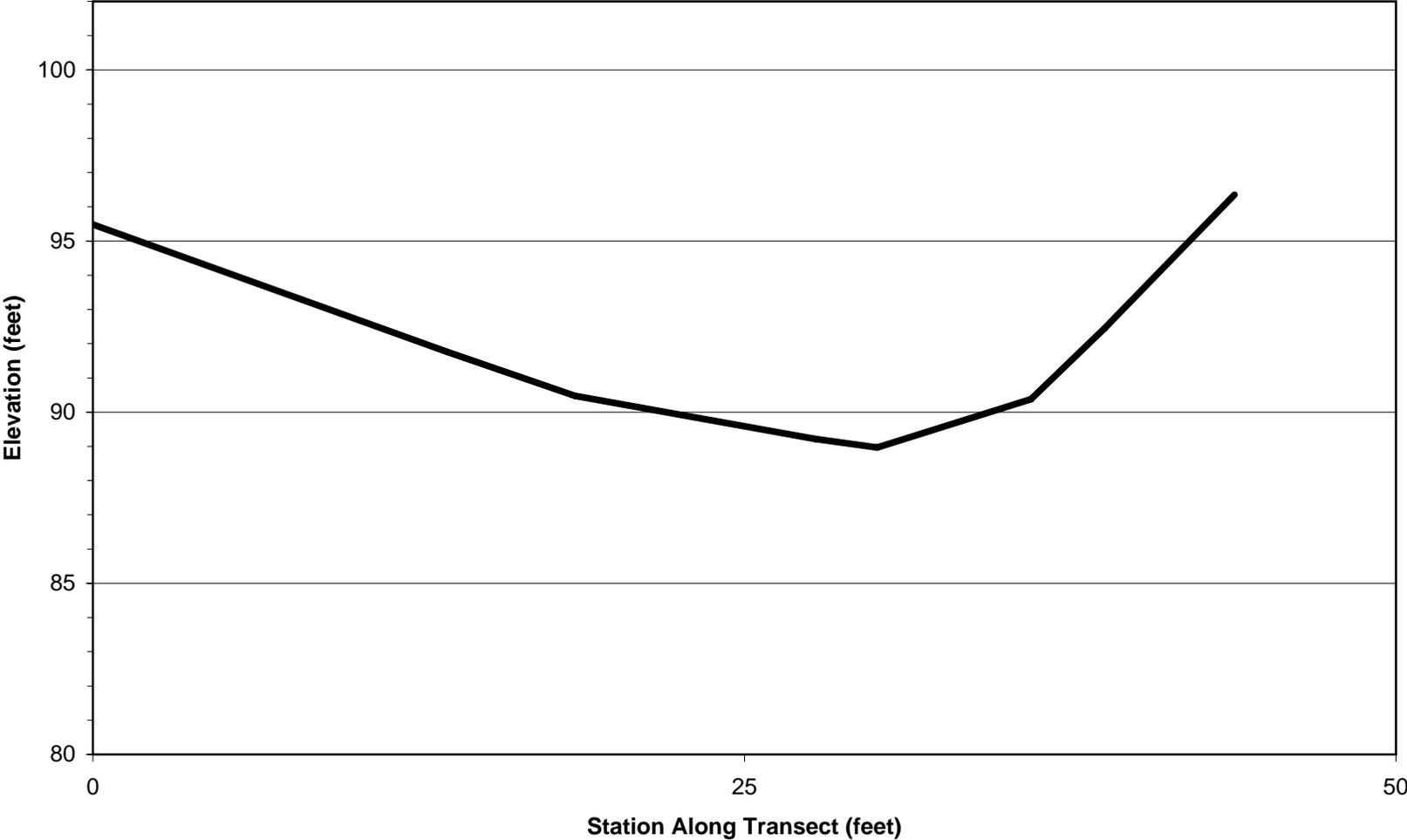
**Year 4: June 2, 2009**  
**Transect 1 Creek Cross-Section**



**Year 4: June 2, 2009**  
**Transect 2 Creek Cross-Section**



**Year 4: June 2, 2009**  
**Transect 3 Creek Cross-Section**



**Year 4: June 2, 2009  
Longitudinal Profile**

