

## 2 COMMENTS AND RESPONSES TO ENVIRONMENTAL ISSUES

This section of the Final EIR contains comment letters received during the public review period for the Draft EIR, which concluded on January 23, 2008. This section also includes the oral comments received during the Rocklin City Council and Rocklin Planning Commission Joint Meeting held on January 16, 2008 to receive comments on the Draft EIR. In conformance with State CEQA Guidelines Section 15088(a), written responses to comments on environmental issues received from reviewers of the Draft EIR were prepared.

### 2.1 LIST OF COMMENTS ON THE DRAFT EIR

Table 2-1 indicates the number designation for each comment letter received, the author of the comment letter, the comment letter date, the comment number and the comment topic.

<b>Table 2-1 Written and Oral Comments Received on the Draft EIR</b>				
Letter #	Commenter	Date	Comment Number	Comment Topic
<b>State Agencies</b>				
1	Governor's Office of Planning and Research, State Clearinghouse and Planning Unit, Terry Roberts, Director, State Clearinghouse	1/24/08	1-1	Other
2	Native American Heritage Commission Katy Sanchez, Program Analyst	12/11/07	2-1	Cultural Resources
<b>Regional and Local Agencies</b>				
3	Placer County Air Pollution Control District, Yushuo Chang, Senior Planner	1/23/08	3-1	Air Quality
			3-2	Air Quality
			3-3	Air Quality
			3-4	Air Quality
			3-5	Air Quality
			3-6	Air Quality
4	Placer County Water Agency, R. Brent Smith, P.E., Deputy Director of Technical Services	1/22/08	4-1	Public Utilities
			4-2	Public Utilities
			4-3	Public Utilities
5	Public Utilities Commission, Kevin Boles, Environmental Specialist, Rail Crossings Engineering Section, Consumer Protection and Safety Division	1/14/08	5-1	Traffic
6	South Placer Municipal Utility District, Dari Burbano, Engineering Technician	12/11/07	6-1	Public Utilities
7	United Auburn Indian Community of the Auburn Rancheria, Greg Baker, Tribal Administrator	1/3/08	7-1	Cultural Resources

**Table 2-1  
Written and Oral Comments Received on the Draft EIR**

Letter #	Commenter	Date	Comment Number	Comment Topic
<b>Members of the Public</b>				
8	Anonymous	1/14/08	8-1	Other
9	Anna Claiborne	1/23/08	9-1	Other
			9-2	Land Use
			9-3	Land Use
			9-4	Land Use
			9-5	Land Use
			9-6	Traffic
			9-7	Traffic
			9-8	Traffic
			9-9	Traffic
			9-10	Biological Resources
			9-11	Air Quality
			9-12	Population & Housing
			9-13	Population & Housing
			9-14	Aesthetics
10	Arlan and Janette Cokeley	1/19/08	10-1	Cumulative Impact
			10-2	Traffic
			10-3	Biological Resources
			10-4	Biological Resources
			10-5	Biological Resources
			10-6	Cultural Impact
			10-7	Alternatives
11	Muriel E. Doran	1/23/08	11-1	Traffic
12	Ms. Rosemary C Elston	Rec'd 1/22/08	12-1	Miscellaneous
13	Richard and Barbara Ernst	1/22/08	13-1	Traffic
14	Rose Fierro	1/23/08	14-1	Fiscal

**Table 2-1  
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Letter #	Commenter	Date	Comment Number	Comment Topic
15	Daniel K. Foster	1/23/08	15-1	Biological Resources
			15-2	Hydrology
			15-3	Public Utilities
			15-4	Miscellaneous
			15-5	Air Quality
			15-6	Aesthetics
			15-7	Hydrology
			15-8	Biological Resources
			15-9	Miscellaneous
16	Heather Franklin	1/16/08	16-1	Fiscal
			16-2	Traffic/Fiscal
			16-3	Public Utilities
			16-4	Fiscal
17	Roberta Garman	1/23/08	17-1	Traffic
18	Jerry and Bonnie Gurzell	1/5/08	18-1	Other
19	Maybelle Henry	1/23/08	19-1	Fiscal
20	Wesley and Ronda Herman	1/14/08	20-1	Other
21	Felice Hussa	1/18/08	21-1	Aesthetics
			21-2	Traffic
			21-3	Alternatives
22	Arlene Jamar	1/18/08	22-1	Public Utilities
23	Marilyn Jasper, Chair Sierra Club, Placer Group,	1/16/08	23-1	Air Quality
			23-2	Land Use
			23-3	Traffic
			23-4	Traffic
			23-5	Traffic
			23-6	Noise
			23-7	Public Utilities
			23-8	Hydrology
			23-9	Hydrology
			23-10	Hydrology

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Letter #	Commenter	Date	Comment Number	Comment Topic
			23-11	Biological Resources
			23-12	Biological Resources
			23-13	Biological Resources
			23-14	Fiscal
			23-15	Biological Resources
			23-16	Other
24	James W. Johnson	1/23/08	24-1	Fiscal
25	Betty Knaak	Rec'd 1/22/08	25-1	Traffic
26	Liese Loon-Stern	Rec'd 1/22/08	26-1	Miscellaneous
27	Michelle Marchan	1/23/08	27-1	Fiscal
28	Michael Mericante	1/23/08	28-1	Fiscal
29	Linda Morley	12/11/07	29-1	Other
30	David Murillo	1/23/08	30-1	Fiscal
31	Helen Murille	1/23/08	31-1	Fiscal
32	Ananth Narain	Rec'd 1/22/08	32-1	Other
33	Melissa and James Netzel	1/23/08	33-1	Public Services
			33-2	Biological Resources
			33-3	Other
			33-4	Hydrology
			33-5	Biological Resources
			33-6	Fiscal
34	Nick Nichol	1/21/08	34-1	Other
35	Sarah Nitta	1/20/08	35-1	Alternatives
36	Sarah Nitta (Second Letter)	1/23/08	36-1	Traffic
37	Christie Olsen	1/23/08	37-1	Other
38	Janet Olsen	1/23/08	38-1	Fiscal
39	Frank and Jayne Parker	1/19/08	39-1	Miscellaneous

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Letter #	Commenter	Date	Comment Number	Comment Topic
40	Mrs. C.E. Pittman	1/23/08	40-1	Other
41	Robert and Maxine Pohan	Rec'd 1/22/08	41-1	Other
42	R.C. Presley	1/16/08	42-1	Other
43	Lisa and Rusty Pywtorak	1/23/08	43-1	Biological Resources
			43-2	Air Quality
			43-3	Noise
			43-4	Aesthetics
			43-5	Biological Resources
			43-6	Traffic
			43-7	Other
44	Vicki, Margaret and Richard Ramsey	1/18/08	44-1	Public Utilities
			44-2	Noise
			44-3	Noise
			44-4	Noise
			44-5	Noise
			44-6	Noise
			44-7	Noise
			44-8	Public Services
			44-9	Public Services
			44-10	Other
45	Sherill Rohde	1/21/08	45-1	Miscellaneous
46	Lila F. Sasaki	1/23/08	46-1	Public Services
47	Howard and Marilyn Stitt	1/23/08	47-1	Fiscal
48	Eric Sutton	1/22/07	48-1	Fiscal
49	Nancy Tilcock	1/14/08	49-1	Biological Resources
			49-2	Biological Resources
50	Nancy Tilcock (second letter)	No date Rec'd 1/23/08	50-1	Air Quality
			50-2	Energy
			50-3	Other

**Table 2-1  
Written and Oral Comments Received on the Draft EIR**

Letter #	Commenter	Date	Comment Number	Comment Topic
			50-4	Alternatives
			50-5	Energy
			50-6	Land Use
			50-7	Air Quality
51	Pamela N. Tooker	1/16/08	51-1	Public Services
			51-2	Other
52	LeAnne R. Torres	Rec'd 1/22/08	52-1	Other
53	Keith Wagner, Kenyon Yeates on behalf of Rocklin Residents for Responsible Growth	1/23/08	53-1	Traffic
			53-2	Traffic
			53-3	Traffic
			53-4	Air
			53-5	Air
			53-6	Growth Inducing Impacts
			53-7	Fiscal
			53-8	Other
54	Deborah West	1/23/08	54-1	Traffic
55	Mr. and Mrs. Delbert R. Wofford	1/8/08	55-1	Miscellaneous
56	Delbert R. Wofford	1/22/08	56-1	Other
57	Sunny K. Wofford	1/9/08	57-1	Miscellaneous
58	Sunny K. Wofford	Rec'd 1/22/08	58-1	Other
59	Carolyn Wolsey	1/23/08	59-1	Fiscal
60	Illegible name	1/23/08	60-1	Public Utilities
61	Illegible name	Rec'd 1/22/08	61-1	Other
<b>Public Hearings</b>				
62	Rocklin Crossings Public Hearing Meeting Minutes	1/16/08	62-1	Other
			62-2	Traffic
			62-3	Land Use
			62-4	Biological Resources
			62-5	Public Utilities

**Table 2-1  
Written and Oral Comments Received on the Draft EIR**

Letter #	Commenter	Date	Comment Number	Comment Topic
			62-6	Noise
			62-7	Noise
			62-8	Public Services
			62-9	Other
			62-10	Other
			62-11	Traffic
			62-12	Other
			62-13	Biological Resources
			62-14	Other
			62-15	Other
			62-16	Other
			62-17	Miscellaneous
			62-18	Biological Resources
			62-19	Cultural Resources
			62-20	Biological Resources
			62-21	Biological Resources
			62-22	Traffic
			62-23	Biological Resources
			62-24	Other
			62-25	Air Quality
			62-26	Traffic
			62-27	Alternatives
			62-28	Hydrology
			62-29	Miscellaneous
			62-30	Traffic

## 2.2 COMMENTS AND RESPONSES ON THE DRAFT EIR

The written comments received on the Draft EIR and the responses to those comments are provided in this section commencing with the master responses. Following the master responses, each comment letter is reproduced in its

entirety and is followed by the response(s) to the letter. Where a commenter has provided multiple comments, each comment is indicated by a line bracket and an identifying number in the margin of the comment letter.

## MASTER RESPONSE ON ENERGY CONSERVATION AND AIR QUALITY MITIGATION

Commenter Placer County Air Pollution Control District (PCAPCD) suggests additional measures to mitigate the project's short-term construction emissions. The feasibility of these suggestions need not be evaluated, however, since the impact at issue will already be reduced to a less-than-significant level with the implementation of Mitigation Measure 4.3-1. Moreover, and more importantly, a number of PCAPCD's suggestions have already been incorporated into the project through its need to comply with PCAPCD's rules and regulations for construction and through Mitigation Measure 4.3-1 (e.g., trucks and equipment leaving the site shall be cleaned; and traffic speeds on unpaved surfaces shall be limited to 15 miles per hour or less, unless sufficiently stabilized).

To address the significant and unavoidable impacts of long-term operational criteria air pollutant and ozone precursor emissions, the Draft EIR explained that the project would be required to comply with Mitigation Measure 4.3-2. One commenter, the law firm of Kenyon Yeates on behalf of Rocklin Residents for Responsible Growth, questioned the adequacy of this mitigation as drafted. Specifically, the commenter expressed concern that, although the measure required that "emission control measures" be incorporated into the project, the measure did not require that any specific measure be adopted. In response, and based on (i) further reflection regarding the structure and wording of the original measure and (ii) further suggestions by PCAPCD (discussed below), the City has modified Mitigation Measure 4.3-2 to be more specific, to insert flexibility where desirable and necessary, and to include additional obligations. Mitigation Measure 4.3-2 on page 4.3-21 of the Draft EIR is hereby revised as follows:

### Mitigation Measure 4.3-2: Long-Term Operational (Regional) Criteria Air Pollutant and Precursor Emissions.

The City shall require that emission control measures be incorporated into project design and operation. Such measures ~~may~~ **shall** include, but are not limited to, the following items:

- ▶ The project applicant shall provide transit enhancing infrastructure that includes transit shelters, benches, street lighting, route signs and displays, and/or bus turnouts/bulbs, **where determined to be feasible in consultation with City staff and Placer County Transit Agency staff.**
- ▶ The project applicant shall provide bicycle enhancing infrastructure that includes secure bicycle parking.
- ▶ The project applicant, **where determined to be feasible in consultation with City staff,** shall **incorporate measures such as:** provide electric maintenance equipment, use solar, low-emissions, or central water heaters, increase wall and attic insulation beyond Title 24 requirements, and orient buildings to take advantage of solar heating and natural cooling, use passive solar designs, energy efficient windows (double pane and/or Low-E), highly reflective roofing materials, cool paving (high albedo pavement) and parking lot tree shading above that required by code, install photovoltaic cells, programmable thermostats for all heating and cooling systems, awnings or other shading mechanisms for windows and walkways, utilize day lighting systems such as skylights, light shelves, interior transom windows.
- ▶ Parking lot design shall include clearly marked pedestrian pathways between transit facilities and building entrances included in the design.
- ▶ The project applicant shall require that all diesel engines be shut off when not in use for longer than 5 minutes on the premises to reduce idling emissions.
- ▶ **The home improvement superstore (i) shall not rent pick-up trucks to its customers using fuels other than gasoline or natural gas, (ii) shall use natural gas, propane, or electricity in powering its**

**material handling equipment (forklifts), (iii) shall use only natural gas for its primary back-up generators (a secondary, emergency fuel source is required, however, in the event of gas line rupture), (iv) shall install 110/208 volt outlets for use by delivery trucks auxiliary equipment, and (v) shall post signs prohibiting diesel trucks from idling more than five minutes.**

- ▶ **The free-standing discount superstore (i) shall use natural gas, propane, or electricity in powering its material handling equipment (forklifts), (ii) shall utilize delivery trucks that are powered by an auxiliary power unit that comes on when the trucks idle, and (iii) shall post signs prohibiting diesel trucks from idling more than five minutes.**

Although this mitigation measure, particularly as modified, is stringent, it does not tell the full story of the project's energy conservation and pollution reduction obligations. The measures and features required by Mitigation Measure 6-24, which, though intended to reduce greenhouse gas emissions, would also have the tendency to reduce operational emissions of traditional air pollutants. Mitigation Measure 6-24 includes the following requirements:

1. All dock and delivery areas shall be posted with signs informing truck drivers of the California Air Resources Board regulations including the following:
  - ▶ Truck drivers shall turn off engines when not in use.
  - ▶ All diesel delivery trucks servicing the project shall not idle more than five minutes, consistent with Mitigation Measure 4.3-2.
  - ▶ Restrict idling emissions by using auxiliary power units and electrification in the docking areas if provided by the operator.
2. Auxiliary power shall be provided for TRUs, as feasible, at all docking facilities to minimize emissions from these units while on the project site.
3. Implement carpool/vanpool program such as carpool ride matching for employees, assistance with vanpool formation, and provisions of vanpool vehicles.
4. Provide preferential employee parking for carpool and vanpool vehicles.
5. Provide transit incentives (e.g., transit subsidies for employees, implement a parking cash-out program for employees, provide transit route maps, fares, and schedules posted at the worksite in a conspicuous location [e.g., employee breakroom]).
6. Restroom sinks within individual buildings on the site shall use sensor-activated, low-flow faucets. The lowflow faucets, because they regulate flow, reduce water usage by 84%, while the sensors, which regulate the amount of time the faucets flow, save approximately 20% in water usage over similar, manually operated systems.  
(See, Draft EIR, p. 6-77.)

The City has chosen to impose these mitigation measures despite the fact that, as the Draft EIR explains, the project has been designed to include numerous energy efficiency measures, including measures that exceed California's adopted State policy on building efficiency requirements (Title 24) that would reduce the need to generate power. These measures and features include the following:

## **Department of Water Resources—Water Use Efficiency**

Approximately 19% of all electricity, 30% of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater.

- ▶ The project’s landscape plan would be required by the City to include an automatic irrigation system, and the use of drip system irrigation would be encouraged as applicable. The project’s landscape plan is also required by the City to be certified by the landscape architect as meeting the requirements of the Water Conservation in Landscaping Act (Government Code Section 65591, et. seq.). In addition, the project would be required to comply with the requirements of Mitigation Measure 6-24 related to the use of low-flow faucets within building restrooms.

## **California Energy Commission—Building Energy Efficiency Standards in Place and in Progress**

Public Resources Code 25402 authorizes the California Energy Commission (CEC) to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).

- ▶ Construction and operation of all of the proposed buildings on the site would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building. Large retailers have responded to these requirements and the rising cost of energy by increasing the energy efficiency of their retail establishments. Wal-Mart in particular includes a variety of energy efficient design components in its stores including the following:
  - Daylighting (skylights/dimming) - This system automatically and continuously dims all of the lights within the store as the daylight contribution through skylights increases.
  - Night Dimming - Lighting is dimmed to approximately 65% of typical evening illumination during the late night hours.
  - Energy Efficient HVAC Units - Super high efficiency packaged heating and air conditioning units with an energy efficiency rating of 10.8 to 13.2.
  - Central Energy Management - Stores are equipped with energy management systems, which are monitored and controlled from the Home Office in Bentonville.
  - Water Heating - Waste heat is captured from the refrigeration equipment to heat water for the kitchen preparation areas of the store.
  - White Roofs - White membrane roofing is used in order to increase solar reflectivity and lower cooling loads.
  - Interior Lighting Program - All new stores use efficient T-8 fluorescent lamps and electronic ballasts.
  - LED Signage Illumination - LED lighting is used in internally illuminated building signage due to its higher efficiency when compared to fluorescent lighting.
  - Water-conserving Fixtures - Restroom sinks use sensor-activated low flow faucets.
- ▶ Home Depot also includes energy efficient design components in its operations. Home Depot has an Energy Management System for all its main overhead building lighting and HVAC equipment. The system includes a

dedicated controller that is connected to a central monitoring station in Atlanta that controls the lighting and HVAC systems to ensure they are operating efficiently and are turned off when they are not needed. A component of this system includes an integrated skylight/photo cell system with photo cells mounted to the outside of the building that measure ambient light levels. Based on these measurements, the Energy Management System can automatically adjust internal lighting levels relative to the amount of light coming through rooftop skylights. Part of this system also includes carbon dioxide sensor controls that automatically close rooftop flutes to allow for greater recirculation of already cooled (or heated) air. The flutes automatically re-open when carbon dioxide sensors indicate that more ventilation is necessary. Energy usage is reduced by maximizing the amount of already cooled (or heated) inside air that can be re-circulated rather than having to cool (or heat) new air from outside. In addition, Home Depot uses highly energy efficient rooftop HVAC units and T-5 Fluorescent lighting systems in their stores.

With the implementation of these energy-efficiency measures by the project's major retail tenants and compliance with Title 24 requirements at a minimum by the remaining tenants, the project would be expected to achieve energy efficiency in excess of Title 24 requirements. (See, Draft EIR, pp. 6-70 through 6-77.)

Despite these incorporated measures, commenters have suggested additional mitigation measures to address the significant and unavoidable air quality impacts of the project. As is evident from the amended text of Mitigation Measure 4.3-2, as shown above, the City has accepted many of these suggestions. Notably, the City has modified that measure to include all but two of PCAPCD's specific suggestions about how to address operational emissions. Other suggestions were more difficult to respond to, as they were far less specific. Even as to those suggestions, however, the City notes that many of them are similar to what is contemplated by existing legal requirements, mitigation measures, applicant commitments, or expectations based on recent relevant experience and marketplace considerations. Still, in light of (i) the stringency of existing PCAPCD requirements, (ii) the already extensive energy conservation measures and design features the developer's major tenants have already committed to, and (iii) the already stringent character of Mitigation Measure 4.3-2 as modified above, the City declines to adopt each and every suggestion made by each commenter, as explained below.

In response to PCAPCD's specific suggestions, Measure 4.3-2 has been modified: to require the proposed home improvement superstore (Home Depot) to rent only gasoline or natural gas pick-up trucks to its customers, to use only natural gas for its primary back-up generators (a secondary, emergency fuel source is required, however, in the event of gas line rupture), to install 110/208 volt outlets as required to run delivery trucks auxiliary equipment, and to post signs prohibiting diesel trucks from idling more than five minutes (a prohibition that was already required by Mitigation Measure 4.3-2 as written in the Draft EIR). Measure 4.3-2 has also been modified to require the proposed free-standing discount superstore (Wal-Mart) to utilize delivery trucks that are powered by auxiliary power units which come on when the trucks idle, and to post signs prohibiting diesel trucks from idling more than five minutes. Per the modified Measure 4.3-2, both major tenants would be required to use natural gas, propane, or electricity in powering its material handling equipment (forklifts)

The City does not believe it is practical or feasible, however, to impose a formal condition or mitigation measure precluding the major tenants from being serviced by delivery trucks manufactured in 1996 or earlier. Local distributors could be hurt by such a measure, as they likely have some vehicles older than 1996, though such vehicles would have to meet State emissions control requirements. In any event, such a measure or condition would likely accomplish only a very small benefit, as Home Depot's freight carriers, for example, replace their truck equipment on average every 5 to 7 years, making it likely that, even without a formal measure or condition, the Home Depot fleet will contain 1996 or newer models.

The City also declines to adopt PCAPCD's suggestion that HVAC systems be equipped with the PremAir catalyst system or a similar system made by another manufacturer, if found to be available and economically feasible at the time building permits are issued. The City has learned that experience elsewhere in the country suggests that the costs of these systems exceed their benefits, particularly in light of the already very considerable expense associated with the many other energy conservation and air pollution reduction features of the project. In fact, the

PCAPCD itself has actually chosen to discontinue advocating the PremAir system as a mitigation measure due to the fact the manufacturer has not provided the District with any data and third party verification regarding the claimed benefit of the PremAir units. (Pers. Comm. Brent Backus, PCAPCD, August 2007.) Furthermore, on October 26, 2007, the PremAir manufacturer, BASF, announced that this product will no longer be sold after December 31, 2007. For these reasons, the Sacramento Metropolitan Air Quality Management District (SMAQMD), like the PCAPCD, has suspended its past practice of recommending the use of operational mitigation measure 26 (Install ozone destruction catalyst on air conditioning systems) in any future Air Quality Mitigation Plans (AQMP). (See <http://www.airquality.org/lutran/news2007/2007Q4.pdf>)

Although PCAPCD offered very specific suggestions about how to further mitigate operational emissions, another commenter offered less specific mitigation suggestions, which are more difficult for the City to respond to. The law firm of Kenyon Yeates, on behalf of Rocklin Residents for Responsible Growth, suggests that the project incorporate the mitigation measures set forth in the California Air Pollution Control Officer's Association's (CAPCOA) January 2008 report, titled "CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act." The commenter does not direct the City to any specific mitigation, but rather vaguely refers the City to 45 pages of potential mitigation measures in Appendix B of the CAPCOA report. The City finds that this comment is not specific enough to justify a detailed response. If the commenter had specific measures in mind, the comment should have focused the City's attention on any such measures.

CEQA does not require analysis of every *imaginable* alternative or mitigation measure; its concern is with *feasible* means of reducing environmental effects. (*Concerned Citizens of South Central Los Angeles v. Los Angeles Unified School Dist.* (1994) 24 Cal.App.4th 826, 841.) Thus, the City need not undertake the burden of analyzing all 45 pages of mitigation measures when the commenter has provided no specific examples or assertions as to why some or all of these mitigation measures are feasible to reduce the air quality effects of the project.

Moreover, the mitigation measures in Appendix B of the CAPCOA report are designed to mitigate greenhouse gas emissions, and not traditional air quality impacts. As suggested above with respect to Mitigation Measure 6-24, it is recognized that conventional air pollution control measures generally have the co-benefit of reducing Greenhouse Gas (GHG) emissions. (See e.g., Climate Protection Campaign and the Community Clean Water Institute (June 2005) Report on the Integration of Air Quality Management and Climate Protection, prepared for the Bay Area Air Quality Management District and the Sonoma County Waste Management Agency <<http://www.recyclenow.org/AirDistrict-PhaseTwo061205.pdf>>.) Whether particular mitigation measures designed to mitigate greenhouse gas emissions would also effectively mitigate traditional air quality emissions, however, is sometimes a question without a clear answer.

Because of the cumulative nature of GHG emissions and climate change impacts, the measures designed to mitigate impacts of greenhouse gases may not necessarily fully avoid or mitigate traditional air quality impacts. Analysis in the CAPCOA report indicates that a number of the suggested greenhouse gas mitigation measures would actually have the potential to *increase* emissions of criteria and toxic pollutants. (See CAPCOA, pp. 4, 19.) For instance, GHG reduction efforts such as alternative fuels and methane digesters may create significant levels of increased pollutants that are detrimental to the health of the nearby population (e.g., particulate matter, ozone precursors, toxic air contaminants). (CAPCOA, p. 19.) The mitigation measures summary in the CAPCOA report, Appendix B, confirms that some of the recommended measures have adverse effects on air quality. (See "Secondary Effects" column on pp. B-13 (MM T-21—issues with energy intensive ethanol production process), B-31 (MM C-1—increased NO<sub>x</sub>), B-32 (MM C-2—increased THC, NO<sub>x</sub>), B-34 (MM RTP-1—possible local CO increase, MM RTP-2—possible local CO increase.) In addition, many of the CAPCOA suggested mitigation measures are not even applicable to the development and operation of commercial land uses.

Regardless, as noted above, the project's major retail tenants would already incorporate energy efficiency measures, many of which are recommended in the CAPCOA report, including: white roofs (cf. CAPCOA MM E-

13: Cool Roofs) (Wal-Mart only); energy efficient HVAC units (cf. CAPCOA MM E-9: Low Energy Cooling); day lighting (cf. CAPCOA MM E-22: Day Lighting Systems); and water-conserving fixtures (cf. CAPCOA MM E-23: Low-Water Use Appliances). The project would also already incorporate a number of the other CAPCOA mitigation measures including: secure bicycle parking (cf. CAPCOA MM T-1: Bike Parking); project proximity to existing residential and pedestrian access connection (cf. CAPCOA MM T-5: Pedestrian Network, MM T-6: Barriers Minimized); transit enhancing infrastructure (cf. CAPCOA MM T-7: Bus Shelter for Existing/Planned Transit Service); pedestrian pathways through parking lot to transit facilities (cf. CAPCOA MM T-12: Pedestrian Pathway Through Parking); project proximity to planned Class II bikeway on Sierra College Blvd. (cf. CAPCOA MM D-2: Orientation to Existing/Planned Transit, Bikeway or Pedestrian Corridor); and multiple commercial services in single location (cf. CAPCOA MM D-3: Services Operational).

Finally, Mitigation Measure 4.3-2 requires consideration of the following additional measures to reduce energy consumption, which conform to mitigation suggested in the CAPCOA report: use solar, low-emissions, or central water heaters (cf. CAPCOA MM E-14: Solar Water Heaters); orient buildings to take advantage of solar heating and natural cooling (cf. CAPCOA MM E-7: Solar Orientation); use passive solar designs (cf. CAPCOA MM E-21: Passive Heating and Cooling Systems); use energy efficient windows (double pane and/or Low-E), highly reflective roofing materials, cool paving (high albedo pavement) and parking lot tree shading above that required by code and increase wall and attic insulation beyond Title 24 requirements (cf. CAPCOA MM E-6: Exceed Title 24); install photovoltaic cells (cf. CAPCOA MM E-5: On-site Renewable Energy System), programmable thermostats for all heating and cooling systems (cf. CAPCOA MM E-20: Programmable Thermostats), and awnings or other shading mechanisms for windows and walkways (cf. CAPCOA MM E-18: Shading Mechanisms). Such measures would be implemented if determined to be feasible.

California Public Resources Code section 21061.1 explains that feasibility involves a balancing of various “economic, environmental, social, and technological factors.” The concept of “feasibility” also encompasses the question of whether a particular mitigation measure promotes the underlying goals and objectives of a project. (*City of Del Mar v. City of San Diego* (1982) 133 Cal. App. 3d 410, 417.) “[F]easibility’ under CEQA encompasses ‘desirability’ to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors.” (*Ibid.*; see also *Sequoyah Hills Homeowners Assn. v. City of Oakland* (1993) 23 Cal. App. 4th 704, 715.) Balancing the relevant economic, environmental, social, and technological factors, however, it is evident that requiring all of the CAPCOA suggested measures is not appropriate for this project.

As discussed above, energy-saving features are already incorporated into all aspects of the project. Both Wal-Mart and Home Depot carefully select which features to include in their prototypes so that the combination of features creates the greatest feasible energy savings. A feature that causes one system to operate more efficiently could have an indirect effect on another system that results in that system operating less efficiently. The end result is a less energy efficient store. The commenter has not shown that the CAPCOA suggested mitigation measures, in combination with the many other features that the project would include, would significantly reduce the project's impact on air quality. Instead, the commenter takes an ad hoc approach of simply urging the City to require *all* the CAPCOA suggested mitigation measures. The focus of applying mitigation should be on the goal that everyone shares—reducing air quality emissions. Thus, the City believes, businesses must be allowed some flexibility to find the most effective way to reach that goal given their particular strengths and challenges.

Furthermore, there are also policy concerns to consider in the City's ultimate analysis of the feasibility of these suggested CAPCOA mitigation measures. Projects that require review under CEQA would be targeted to include these CAPCOA mitigation measures to mitigate air quality impacts, while projects that do not require review under CEQA would not be targeted. Since the decision to review a project under CEQA is largely dependent on the local jurisdiction's regulatory scheme (similar entitlements can be either discretionary or ministerial, depending on the jurisdiction), this approach could result in dramatically different standards throughout the State and even the region. It could also result in many unintended consequences such as rendering certain jurisdictions less favorable to developers and putting certain projects at an economic disadvantage as compared to direct

competitors. Moreover, such an ad hoc approach targeting only certain projects and resulting in different standards throughout the State is less desirable than a uniform, wide-spread approach to mitigating air quality impacts.

This approach could also conflict with the statewide goal of reducing air quality emissions in the most effective way possible, through State adopted policy and the consideration of new policies. Many of the CAPCOA greenhouse gas mitigation measures implicate energy efficiency, but California's Title 24 represents the *adopted* State policy on building efficiency. The State adopted Title 24 specifically to reduce California's energy consumption and the State updates it periodically to incorporate new technology. Title 24 represents the State's determination on green building practices taking the health and safety of the end users into account. As discussed above, the proposed project would include numerous energy efficiency measures, including measures that exceed Title 24 requirements, that would reduce the need to generate power and indirectly reduce air quality emissions.

Notably, the State itself is taking a number of steps likely to result in stricter (greener) building codes within the foreseeable future. Once adopted, new statewide requirements will be applied uniformly, creating a more "level playing field" than would result from an ad hoc approach such as that described above. Such efforts include, but are not limited to:

- ▶ **State of California Energy Action Plan:** CEC, the California Power Authority (CPA), and the California Public Utilities Commission (CPUC) have adopted an "Energy Action Plan" (EAP) that sets forth a commitment to achieve joint goals for California's energy future through specific actions. The second EAP (EAP II) describes a coordinated implementation plan for state energy policies that have been expressed through the Governor's Orders, public positions, instructions to agencies, legislative direction and other energy related policies. (CEC et al., EAP II <[http://www.energy.ca.gov/energy\\_action\\_plan/2005-09-21\\_EAP2\\_FINAL.PDF](http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF)> (as of May 30, 2007).) The overarching goal of the EAP II is for California's energy to be adequate, technologically advanced, affordable, and environmentally-sound. One of the key actions identified by the EAP II with respect to renewable energy and GHG emission reductions is to implement a cost-effective program to achieve the 3,000 megawatts (MW) goal of the Governor's "Million Solar Roof's initiative." Another key action identified by the EAP is to establish a program to encourage solar hot water heating.
- ▶ **The California Solar Initiative (CSI):** California has set a goal to create 3,000 MW of new solar produced electricity by 2017. This Initiative is administered by the CPUC. On March 2, 2006, the CPUC opened a proceeding to develop rules and procedures for the Initiative and to continue considering policies for the development of cost-effective, clean, and reliable distributed generation of energy. On August 21, 2006, the Governor signed Senate Bill 1 (SB 1), which directs the Energy Commission to implement the Solar Initiative program within certain budget limits and specific requirements. CPUC rulemaking is currently in progress to reconcile its decisions with SB 1. Current incentives under the Initiative provide upfront, capacity-based payment for new solar systems. This incentive system changed in 2007, however, into performance-based payments. (Go Solar California, The California Solar Initiative <<http://www.gosolarcalifornia.ca.gov/csi/index.html>> [as of March 1, 2008].)
- ▶ **Title 24 Update:** Title 24 is revised on a three-year cycle. The next update will be in 2008. It is widely recognized that Updates for the Title 24 Building standards will be an effective method by which the State may reduce GHG emissions. For example, the EAP II (described above) directs the CEC to adopt new building standards for implementation in 2008 that include cost-effective demand response technologies and the integration of photovoltaic systems. (CEC, 2008 Update to the Building Energy Efficiency Standards, 2008 Standards Background and Objectives <<http://www.energy.ca.gov/title24/2008standards/background.html>> (as of March 1, 2008).) Similarly, Executive Order 2-3-05, the Climate Action Initiative, identifies Title 24 Building Standards as an explicit strategy in a menu of actions that will be necessary to meet the goals of the Climate Action Initiative.

In view of the ongoing efforts by the State of California to develop uniform standards for achieving even more energy conservation than is already required by Title 24 in its current form, the City believes that it should refrain from imposing even more mitigation obligations than it has already done through Mitigation Measure 4.3-2 as modified. Doing more would potentially create a conflict with the measures ultimately adopted by the State (after all of the public input and process necessary for regulatory action at the state level). Such a conflict could lead to a piecemealed approach to energy conservation and air pollution reduction requirements under which the project area would be subject to complex and expensive mandates that diverge from state norms or from requirements imposed in surrounding jurisdictions prior to the time when new statewide requirements are adopted.

Comments addressed in this Master Response include 3-4, 3-5, 23-1, 39-1, 50-1, 50-2, 50-3, 50-5 and 53-5.

## **MASTER RESPONSE REGARDING SPECIAL-STATUS FISH AND SECRET RAVINE CREEK**

A number of commenters have voiced concern regarding the project's potential effect on Secret Ravine Creek and the creek's salmon population. The following master response addresses those various comments in a comprehensive manner by providing information on special-status fish and habitat in the project area, as well as describing the potential impacts from the project and the effectiveness of the mitigation proposed to address such impacts. The response also addresses the analysis and conclusions of the following studies identified by the commenters: Ayres, et al. (2003), U.C. Santa Barbara, *Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine*, Placer County, CA; and U.C. Berkeley, 2003, *A benthic macro invertebrate survey of Secret Ravine: the effects of urbanization on species diversity and abundance*.

The southeast corner of the Rocklin Crossings Project is located approximately 300 feet northwest of Secret Ravine Creek. Secret Ravine Creek, which is part of the Dry Creek Watershed, provides spawning and rearing habitat for the federally threatened Central Valley steelhead (*Oncorhynchus mykiss*) and spawning habitat for fall- and late fall-run Chinook salmon (*Oncorhynchus tshawytscha*), a federal candidate species and state species of special concern. Thus, uncontrolled soil erosion generated during project construction could indirectly affect fish habitat and benthic macroinvertebrates by degrading the water quality within Secret Ravine Creek. Urban pollutants generated from the site during ongoing operations could also potentially degrade water quality, if not properly controlled and treated.

As discussed in the Master Response on Water Quality below, the project's runoff, erosion and subsequent sedimentation issues, however, would be minimized or eliminated, through implementation of Mitigation Measures 4.10-2 and 4.10-3. The mitigation proposed would prevent the project from contributing to the degradation of Secret Ravine Creek and the special-status fish that use the Creek. Moreover, as discussed in the technical memorandum on Secret Ravine Creek prepared by ECORP Consulting, Inc., (ECORP) (Appendix A), it appears that, regardless of the existing or proposed uses of the project site, special-status fish populations in Secret Ravine Creek have already been declining in recent years. The reason for the recent decline in fall-run Chinook salmon stocks in Secret Ravine Creek is unclear, however. The decrease in the numbers of live Chinook salmon, carcasses, and redds observed in 2007 in the Dry Creek Watershed is similar to low numbers observed in other California streams. (A "redd" is a gravel-covered depression [or nest] in which salmon lay their eggs.) Thus, the decline appears to be a coast-wide phenomenon, and is likely related to ocean conditions (Pacific Fishery Management Council 2008) rather than causes local to Secret Ravine Creek. (Detailed data and analysis regarding current special-status fish populations in Secret Ravine Creek can be found in ECORP's technical memorandum, attached as Appendix A and incorporated herein by reference.)

Based on the positive results of presence/absence surveys conducted by California Department of Fish and Game (CDFG) in 2004 and 2005 and observations of juvenile salmonids in 2007 by ECORP biologists, however, successful spawning and rearing is still occurring even though the overall quality of the stream habitats within lower Secret Ravine Creek (i.e., within the general Project area) is currently relatively poor for anadromous fish. The results of habitat typing in 2007 by ECORP biologists within the area of potential impact associated with the Rocklin Crossings project and the project's proposed detention basin indicate that limited spawning and rearing

habitat is present for both Central Valley steelhead and Chinook salmon. In general, spawning and rearing habitat for anadromous salmonids requires cold flowing water, suitable substrates, and readily available food sources. Both steelhead and Chinook salmon require gravel and cobble substrates with limited amounts of fine sediments (sand, silt, and clay) for spawning. Fry (a term used for a young salmon after it hatches from the egg), and older juveniles require adequate instream cover (cobble or boulders, large woody debris, undercut banks, or submerged and overhanging vegetation) for protection from predators. The stream habitats in both Dry Creek and Secret Ravine Creek, however, consist primarily of flatwater areas comprised of runs and shallow pools with very few riffles (ECORP 2007, 2008). Moreover, the small amount of riffle and pool tail-out habitat that occurs in lower Secret Ravine Creek is already degraded by an abundance of sand, resulting in embeddedness of cobble and gravel substrates. (Detailed data and analysis regarding current special-status fish habitat in Secret Ravine Creek can be found in ECORP's technical memorandum, attached as Appendix A.)

The poor to moderate quality of the stream habitats in Secret Ravine Creek is also evidenced by the moderate benthic macro invertebrate (BMI) diversity noted within the above reaches of lower Secret Ravine Creek. Macroinvertebrates are an important food source for Chinook salmon and steelhead and are also good indicators of stream quality. While the "*A benthic macro invertebrate survey of Secret Ravine*" (U.C. Berkeley 2003) study attributes the differences in BMI community structure between the upstream and downstream sites to impacts associated with urban runoff and nutrient loading in the vicinity of the downstream site, no information (water quality data or sources of impairment) was provided in the study to support this conclusion. (Detailed data and analysis regarding current BMI populations and habitat in Secret Ravine Creek, including further analysis of the U.C. Berkeley 2003 study, can be found in ECORP's technical memorandum, attached as Appendix A.)

The abundance of fine sediment has been identified by CDFG, the DCC, Vanicek (1993), Ayres, et al. (2003), and others as a major issue relative to spawning and rearing habitat for both Central Valley steelhead and Chinook salmon in the lower reaches of the creek. According to the results of an ecological risk assessment conducted by Ayres, et al. (2003), sediment is associated with two other stressors, stream flow and channel morphology. The risk assessment used two models (the Modified Relative Risk Model and the Stressor-Driven Risk Model) and available data to help understand and predict links between sources, stressors, and their resulting ecological effects. Even though both models identified sediment as the primary stressor in the creek, neither model was able to accurately account for the relative contributions that any particular stressor has on the system. Ayres, et al. (2003) attributed increased sedimentation in Secret Ravine Creek to the presence of impervious surfaces and off-highway vehicle use. Most of the existing impervious surfaces within close proximity to the creek, however, are associated with Interstate 80, single family residences that occur along much of the stream channel, and residential roads that cross the creek, not the proposed project site. In general, small to large amounts of impervious surfaces are already present along portions of Secret Ravine Creek.

Since the majority of the creek flows through private property, most of the off-highway vehicle use has occurred in the lower reaches below Sierra College Boulevard, especially between China Garden Road and the confluence with Miners Ravine Creek, where public access is readily available. Avoidance and protection measures to be implemented along Secret Ravine Creek as part of the proposed Vista Oaks Development (located immediately downstream of the end of China Garden Road) should eliminate off-highway vehicle use in this area and allow for stabilization of the stream banks. Elimination of this major source of stream bank erosion and fine sediment should reduce the overall amount of sediment in the lower reaches of the creek.

While habitat within Secret Ravine Creek may be currently of poor to moderate quality, the project would not contribute to any further degradation. As discussed in the Master Response on Water Quality below, with implementation of Mitigation Measures 4.10-2 and 4.10-3, the water entering Secret Ravine Creek would meet existing water quality criteria from the project area, and the project's potential impacts on Central Valley steelhead and designated Critical Habitat, and on Central Valley fall/late fall-run Chinook salmon, as well as BMIs, would be reduced to a less-than-significant level.

To clarify how the BMPs referenced in Mitigation Measure 4.12-11 would be implemented to prevent degradation of Secret Ravine Creek, which, in turn, prevents degradation of the Chinook salmon and Steelhead habitat, the last paragraph on page 4.12-27 of the Draft EIR is hereby revised as follows:

With the implementation of the BMPs identified in Mitigation Measures 4.10-2 and 4.10-3, the ~~storm~~ **stormwater** discharge from the project site would be captured within the project's drainage systems and would be filtered through **pre-treatment devices such as hydrodynamic oil/water separators and/or catch basin inlet filters** ~~other equally effective control systems~~ prior to being directed to the **water quality basin. Once in the basin, the stormwater would undergo further treatment. Following discharge from the** detention basin. ~~Once in the detention basin, the settlement of undissolved solids would occur, further removing contaminants from the storm water. As the storm~~ **stormwater is discharged from the detention basin, it would flow through an existing grassy swale for approximately 300 feet before entering Secret Ravine Creek. The grassy swale would remove additional contaminants within the storm water through biofiltration. The implementation of these BMPs, consistent with the requirements of the site's NPDES permit and the SWPPP, **and design criteria identified by PRSCG**, would ensure that the quality of the water entering Secret Ravine Creek would not be substantially degraded. With implementation of the identified mitigation measures, the project's impacts on Central Valley fall/late fall-run Chinook salmon and Central Valley steelhead trout would be reduced to a less-than-significant level.**

Comments addressed in this Master Response include 10-3, 12-1, 15-1, 15-2, 15-3, 15-4, 15-7, 33-5, 39-1, 41-1, 43-5, 45-1, 49-1, 49-2, 55-1, 56-1, 57-1, 62-13, 62-16, 62-17, and 62-18.

## MASTER RESPONSE ON WATER QUALITY

A number of commenters have voiced concern regarding the project's stormwater runoff and its potential to adversely affect Secret Ravine Creek. The following master response addresses those various comments in a comprehensive manner describing the potential water quality impacts from the project and the effectiveness of the mitigation proposed to address such impacts.

The southeast corner of the Rocklin Crossings Project is located approximately 300 feet northwest of Secret Ravine Creek. Uncontrolled soil erosion generated during project construction could potentially degrade the water quality within Secret Ravine Creek. Urban pollutants generated from the site during ongoing operations could also potentially degrade water quality, if not properly controlled and treated.

The project's runoff, erosion and subsequent sedimentation issues would be minimized or eliminated, through implementation of Mitigation Measures 4.10-2 and 4.10-3, which require the preparation of an erosion control plan and stormwater pollution prevention plan (SWPPP) and the installation of appropriate best management practices (BMPs) for compliance with all the requirements of the City's Stormwater Runoff Pollution Control Ordinance (Title 8, Chapter 8.30 of the City Code) and the Grading and Erosion and Sedimentation Control Ordinance (Title 15, Chapter 15.28 of the City Code), which regulate stormwater and prohibit non-stormwater discharges except where regulated by an NPDES permit.

The BMPs proposed to be implemented during construction include: the use of soil stabilizers, fiber rolls, inlet filters, and gravel bags to prevent pollutants from being carried off-site in stormwater generated on the project site. The erosion control plan would ensure that proper control of siltation, sedimentation, and other pollutants would be implemented per the National Pollution Discharge Elimination System (NPDES) permit requirements and City ordinance standards. Debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material would not be allowed to enter into or be placed where it may be washed by rainfall or runoff into Secret Ravine Creek. Furthermore, the SWPPP would specify the pollutants that are likely to be used during construction and that could be present in stormwater drainage and non-stormwater

discharges; and to ensure the BMPs are effective, a sampling and monitoring program would be included in the SWPPP that meets the requirements of SWRCB Order 99-08-DWQ. (Mitigation Measures 4.10-2c.)

Site operations with the potential to degrade water quality in the long term would also be mitigated through Mitigation Measure 4.10-3, which requires the project applicant to identify additional storm water runoff BMPs. Currently, stormwater runoff from the project is planned to be pre-treated through roadway catchbasin filters and continuous deflection system (CDS) units, and would then be routed to a detention basin. CDS units are more fully described in Appendix B of this Final EIR. While the catchbasin filters and CDS units would function as the primary treatment BMPs, the detention basin would serve to further reduce pollutants in stormwater through infiltration, biological uptake, and settling. The detention basin has been designed to function as a water quality basin in accordance with Guidance Document for Volume and Flow-based Sizing of Permanent Post-Construction Best Management Practices for Stormwater Quality Protection published by the Placer Regional Stormwater Coordination Group (PRSCG) (May 2005), and would serve to provide the preferred “treatment train” system (discussed in Mitigation Measure 4.10-3, below). The detention basin has been designed to serve a dual use; attenuate peak post project flows and accommodate the water quality volume.

ECORP estimated post-project pollutant concentrations for a design that incorporates both CDS units/catchbasin filters and a water quality basin (Table 2-2). Pollutant concentrations are estimated to occur below established limits, for all evaluated pollutants that have associated limits.

Table 2-2 Rocklin Crossing Estimated Pollutant Concentrations							
Constituent of Concern	Units	Secret Ravine Baseline Concentration	Typical* Commercial Concentration	Pre-treatment BMP** Removal (%)	Basin*** Removal (%)	Project w/ Pre-treatment BMPs and Basin	Criteria
Oil and Grease	mg/L	0.00	6.94	33.00	30.30	3.24	Not Available
Total Suspended Solids	mg/L	54.40	84.00	27.00	54.00	28.21	Not Available
Total Dissolved Solids	mg/L	108.90	38.74	15.30	12.80	37.01	450 <sup>a</sup>
Total Organic Carbon	mg/L	10.40	11.84	0.00	22.20	9.21	Not Available
Nitrate	mg/L	1.70	1.21	41.00	35.40	0.46	10 <sup>b</sup>
Nitrite	mg/L	0.00	1.21	41.00	35.40	0.46	1.0 <sup>b</sup>
Zinc (Total)	ug/L	0.00	197.20	47.00	58.50	43.37	43-78 <sup>c</sup>

\* City of Stockton Water Quality Monitoring Program (HSI Hydrologic Systems, 2002 – River Island EIR)  
 \*\* Currently proposed: catchbasin filters and CDS Units. Removal rates based on those for hydrodynamic separators: USEPA NPDES Stormwater BMPs Database (updated 6/2003)  
 \*\*\* Based on those for dry pond USEPA NPDES Stormwater BMPs Database (updated 6/2003)  
 a. Water Quality Limit for Agriculture (Ayers & Westcot)  
 b. Maximum Contaminant Level Allowed in Drinking Water, Regional Water Quality Control Board Basin Plan  
 c. Assumed hardness of 30-60 mg/L, calcium carbonate

The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region identifies narrative criteria for oil and grease. Numerical criteria are not identified; however, the Regional Board has imposed, by order, discharger-specific limits ranging from 10-20 mg/L. The estimated project discharge concentration falls below this limit.

The project's proposed detention basin would serve to mitigate for downstream impacts related to flow modification. The project detention basin is designed to serve a dual detention/water quality function, and thus would serve to minimize the discharge of pollutants from the project site. The incorporation of a water quality basin ensures that the estimated pollutant concentrations (for evaluated pollutants) would comply with existing water quality criteria.

Following discharge from the detention basin, the stormwater would flow through an existing grassy swale for approximately 300 feet before entering Secret Ravine Creek. Such measures are designed to reduce the discharge pollutant concentrations to comply with existing water quality criteria and to minimize the potential for impacting Secret Ravine Creek, Central Valley steelhead and Critical Habitat, or Chinook salmon. (Please see Master Response Regarding Special-Status Fish and Secret Ravine Creek above for a discussion of how runoff from the project could affect fish in Secret Ravine Creek.) Prior to issuance of a grading permit for the site, however, the BMPs would be reviewed for adequacy by the City of Rocklin, Engineering Department to ensure that they would effectively remove pollutants from the site's stormwater runoff. At that time, if technologies as effective as, or more effective than, catch-basin filters or CDS units are available, they could be considered.

Thus, with implementation of Mitigation Measures 4.10-2 and 4.10-3, the quality of the water entering Secret Ravine Creek would not be degraded and the project's potential impacts on water quality would be reduced to a less-than-significant level. Even so, the City has determined that the language of Mitigation Measures 4.10-2 and 4.10-3 could be improved upon in order to further allay concerns about potential effects on Secret Ravine Creek and to eliminate an incorrect reference to a need for an NPDES permit for the project. Therefore, bullet "b" of Mitigation Measure 4.10-2 on page 4.10-15 of the Draft EIR is hereby revised as follows:

- b. Prior to the issuance of a grading permit or any construction activity, the project applicant shall obtain from the Central Valley RWQCB the appropriate regulatory approvals for project construction including a Section 401 water quality certification, ~~and an NPDES stormwater permit for general construction activity, including construction dewatering activities.~~

In addition, Mitigation Measure 4.10-3 and the Level of Significance after Mitigation discussion commencing on page 4.10-16 of the Draft EIR is hereby revised as follows:

#### Mitigation Measure 4.10-3: Potential Long-Term Degradation of Water Quality

Before issuance of a grading permit for the site, the project applicant shall ~~obtain from the Central Valley RWQCB a general NPDES permit~~ **submit a Notice of Intent to comply with the NPDES General Permit for Construction Related Activities** and shall comply with all of the permit requirements in order to minimize storm water discharges associated with site operations. In addition, the project applicant shall prepare a SWPPP and implement Best Management Practices designed to minimize sedimentation and release of products used during site operations.

Before approval of the final project design, the project applicant shall identify storm water runoff BMPs selected from the Storm Water Quality Task Force's California Storm Water Best Management Practices Handbook (American Public Works Association 1993), the Bay Area Stormwater Management Agencies Association's (1999) Start at the Source: Design Guidance Manual for Stormwater Quality Protection, or similar documents. **The applicant shall adopt a "treatment train" stormwater quality program in which stormwater is subject to more than one type of BMP. Source control BMPs shall constitute the first-step BMPs and shall include, but would not be limited to, administrative controls such as signage at inlets to prevent illicit discharges into storm drains, parking lot and other pavement area sweeping, public education, and hazardous waste management and disposal programs. Second-step BMPs may include underground hydrodynamic separators or catch basin filters, or, upon approval of the City of Rocklin, a substitute device of equal or greater effectiveness. The second-step BMPs shall contain a media or structure designed to remove oil and grease. The third-step BMP shall**

**include a water quality basin designed according to the Guidance Document for Volume and Flow-based Sizing of Permanent Post-Construction Best Management Practices for Stormwater Quality Protection published by the Placer Regional Stormwater Coordination Group (PRSCG) (May 2005).** Typical BMPs that could be used on the project site shall include, but are not limited to, catchbasin inserts, compost storm water filters, sand filters, vegetated filter strips, biofiltration swales, oil/water separators, bioretention basins, or other equally effective measures. Other BMPs shall include, but would not be limited to, administrative controls such as signage at inlets to prevent illicit discharges into storm drains, parking lot and other pavement area sweeping, public education, and hazardous waste management and disposal programs. BMPs shall identify and implement mechanisms for the routine maintenance, inspection, and repair of pollution control mechanisms. In addition, ~~t~~**The BMPs shall be reviewed for adequacy by the City of Rocklin, Engineering Department prior to issuance of a grading permit for the site to ensure that they will effectively remove pollutants from the site's stormwater runoff. Long-term functionality of the stormwater quality BMPs shall be provided for through a maintenance and inspection program. Prior to issuance of the first occupancy permit, the applicant shall submit to the City of Rocklin Department of Public Works a Maintenance and Monitoring Plan for all stormwater BMPs. The Maintenance and Monitoring Plan shall 1) identify a schedule for the inspection and maintenance of each BMP, 2) identify methods and materials for maintenance of each BMP, 3) and include provisions for the repair or replacement of BMPs.**

### Level of Significance after Mitigation

With the implementation of the BMPs identified above, ~~the~~ stormwater discharge from the project site would be captured within the project's drainage systems and would be filtered through ~~oil/water separators and/or other equally effective control systems~~ **pre-treatment devices such as hydrodynamic separators or catch basin inlet filters** prior to being directed to the ~~detention~~ **water quality** basin. Once in the ~~detention~~ basin, the ~~settlement of undissolved solids would occur,~~ **stormwater would undergo further** further removing contaminants from the stormwater **treatment. Long-term functionality of the BMPs would be provided for through a maintenance and monitoring program.** As the stormwater is discharged from the detention basin, it would flow through an existing grassy swale for approximately 300 feet before entering Secret Ravine Creek. ~~The grassy swale would remove additional contaminants within the stormwater through biofiltration.~~ The implementation of these BMPs, consistent with the requirements of the site's NPDES permit and the SWPPP, **and design criteria identified by PRSCG,** would ensure that the quality of the water entering Secret Ravine Creek would not be substantially degraded. With implementation of the above mitigation measures, the project's operational water quality impacts would be reduced to a less-than-significant level.

With respect to the project's affect on Secret Ravine Creek, as discussed in both the Master Response on Special-Status Fish and Secret Ravine Creek above and the technical memorandum on Secret Ravine Creek prepared by ECORP (attached as Appendix A), it appears that, regardless of the existing or proposed uses of the project site, the overall quality of the stream habitats within lower Secret Ravine Creek (i.e., within the general Project area) is currently relatively poor for anadromous fish. Yet, based on the positive results of presence/absence surveys conducted by CDFG in 2004 and 2005 and observations of juvenile salmonids in 2007 by ECORP biologists, successful spawning and rearing is still occurring.

While habitat within Secret Ravine Creek may be currently of poor to moderate quality, the project would not contribute to any further degradation. With implementation of Mitigation Measures 4.10-2 and 4.10-3, the water entering Secret Ravine Creek would meet existing water quality criteria from the project area, and the project's potential impacts on Secret Ravine Creek, would be reduced to a less-than-significant level.

Comments addressed in this Master Response include 10-3, 12-1, 15-1, 15-2, 15-3, 15-4, 15-7, 33-5, 39-1, 41-1, 43-5, 45-1, 49-1, 49-2, 55-1, 56-1, 57-1, 62-13, 62-16, 62-17, and 62-18.

## MASTER RESPONSE ON LAND USE

Several comments were made with respect to whether or not the proposed project is appropriate for the location it is being proposed at, particularly given the proximity of residential land uses.

The City of Rocklin has anticipated retail commercial development at this location for almost 30 years. The project site was zoned for retail commercial uses by the City of Rocklin on May 21, 1979 as a part of a project known at the time as Sierra Center. The establishment of retail commercial zoning on the project site nearly 30-years ago was a public action and the zoning maps for that property since that time have reflected the anticipation of retail commercial uses. Such zoning maps have always been, and continue to be, available for public use and review.

For long-time residents of the area, some of whom have commented on the Draft EIR, it should come as no surprise that retail commercial uses are going to occur at this location. A regional mall project was considered by the City of Rocklin at this location in the late 1980's/early 1990's, and although that much-publicized project never came to fruition, the opportunity for retail commercial uses on the project site via the project's zoning designation that existed then remains in place today and allows for the currently proposed project.

The City of Rocklin adopted an update to its General Plan in 1991 and through that process confirmed the current project area as a site designated for retail commercial land uses. The City of Rocklin has been in the process of preparing another update to its General Plan since 2001/2002, and has conducted extensive public outreach as a part of that effort in several ways.

First, during preparation of the General Plan Update, the City advertised a "window of opportunity" for members of the public and property owners to submit requests for changes in land use designations within the City's Planning Area. The window of opportunity for land use designation requests was advertised in the Placer Herald via two large display ads that were published on June 26, 2002 and July 3, 2002. The 30-day timeframe during which the requests could be submitted was between June 26, 2002 and July 26, 2002. A total of 10 requests were received by the City.

Second, the City Council appointed an 18-member General Plan Advisory Committee (GPAC), comprised of Rocklin citizens, whose function was to provide input and recommendations on the General Plan Update. The GPAC met to consider the aforementioned requested land use changes on June 26, 2003. This meeting, as was the case with all GPAC meetings, was open to the public and advertised in the Placer Herald, and information regarding the GPAC meetings was displayed in the City's five standard posting locations.

Finally, the proposed General Plan Update document and land use diagram were reviewed by the City's Planning Commission and the City Council in separate public meetings, called "Confirmation Hearings". The General Plan Update document and land use diagram were not approved at these hearings, but staff received direction from the Commission and Council that the General Plan Update document and the proposed land use diagram that was presented should be studied as the "preferred project" in the Environmental Impact Report (EIR) for the General Plan Update. The Confirmation Hearings were also noticed in the Placer Herald and open to the public. The Confirmation Hearing before the Planning Commission was conducted on December 7, 2004, and the Confirmation Hearing before the City Council was conducted on January 25, 2005.

Throughout this General Plan Update process, there was never any discussion or input received from the public, the Planning Commission or City Council with regard to the appropriateness of the retail commercial land use designation and zoning for the properties surrounding the Sierra College Boulevard/Interstate-80 interchange, including the proposed Rocklin Crossings project site.

At the time that the retail commercial zoning was established for the project site, the adjacent properties to the east were designated for residential uses, and that residential use designation remains today. The City of Rocklin,

similar to many other jurisdictions, has locations such as this where residential and commercial uses are adjacent to each other. The City recognizes that such uses could create conflicts and as such, the City of Rocklin General Plan contains two Commercial Land Use policies, which state as follows: “To minimize conflicts between new commercial land uses and other land uses, especially residential, park, and recreational uses.” (Policy 21), and “To require that commercial land uses be buffered from incompatible land uses and protected from encroachment by residential or other incompatible use through the use of techniques including, but not limited to, landscaping, soundwalls, berms, fencing, open space setbacks, greenbelts, and building orientation.” (Policy 22)

As noted on page 4.1-10 of the Draft EIR, the proposed project includes the implementation of Development Guidelines that would establish and control the design character for the entire project. These Development Guidelines address the compatibility of the proposed project with the adjacent land uses through the implementation of landscape buffering and the construction of screening walls along the eastern property line to shield existing and proposed future residential uses from the project’s commercial operations, consistent with the policies stated above.

The proposed land use and level of development at this site is predominantly consistent with the City’s long-time General Plan and zoning designations for the property (with the exception of 1.23 acres), which reflect its potential as a tax-generating commercial area due to its proximity to, and visibility from, Interstate 80. With the exception of the 1.23 acres, the project is also consistent with the City’s General Plan land use and zoning designations for the project site. While currently not fully developed, the adjacent properties are predominantly designated for retail commercial uses, with only the properties to the east of the project site designated for residential use.

With regard to the 1.23 acres of the project site that are not designated for retail commercial uses, the proposed project is requesting a General Plan amendment and rezone of the 1.23 acres so that the project would not conflict with the site’s land use or zoning designations, as discussed on page 4.1-8 of the Draft EIR. It should be noted that the adjacent proposed Rocklin 60 residential project is also requesting a General Plan amendment and rezone for a 1.23 acre portion of land on that project site that is currently designated and zoned for retail commercial uses. This would make it such that if both the Rocklin Crossings project and the Rocklin 60 project are approved, the conversion of the 1.23 acres to retail commercial uses for the Rocklin Crossings project and the conversion of 1.23 acres to residential uses for the Rocklin 60 project would essentially be a “wash”, with no overall reduction or gain.

Comments addressed in this Master Response include 9-1, 20-1, 21-1, 33-3, 40-1, and 52-1.



ARNOLD SCHWARZENEGGER  
GOVERNOR

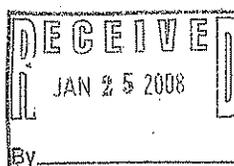
STATE OF CALIFORNIA  
GOVERNOR'S OFFICE of PLANNING AND RESEARCH  
STATE CLEARINGHOUSE AND PLANNING UNIT



CYNTHIA BRYANT  
DIRECTOR

January 24, 2008

David Mohlenbrok  
City of Rocklin  
3980 Rocklin Road  
Rocklin, CA 95677



Subject: Rocklin Crossings Project  
SCH#: 2006112097

Dear David Mohlenbrok:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on January 22, 2008, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

"A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts  
Director, State Clearinghouse

Enclosures  
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044  
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

**Document Details Report  
State Clearinghouse Data Base**

**SCH#** 2006112097  
**Project Title** Rocklin Crossings Project  
**Lead Agency** Rocklin, City of

**Type** EIR Draft EIR  
**Description** The Rocklin Crossings project (proposed project) includes the construction of a regional shopping center on approximately 55.1 acres at the southeast corner of Interstate-80 and Sierra College Boulevard. The property is proposed to be subdivided into 18 parcels. A variety of retail uses are proposed for the center, including major tenants (expected to be a Wal-Mart Supercenter and a Home Depot), smaller retail tenants and restaurants. Other traveler-serving uses could also be developed within the project site. Preliminary plans call for approximately 21 buildings totaling a maximum of 543,500 square feet with approximately 2,463 parking stalls.

**Lead Agency Contact**

**Name** David Mohlenbrok  
**Agency** City of Rocklin  
**Phone** 916-625-5162 **Fax**  
**email**  
**Address** 3980 Rocklin Road  
**City** Rocklin **State** CA **Zip** 95677

**Project Location**

**County** Placer  
**City** Rocklin  
**Region**  
**Cross Streets** I-80 and Sierra College Boulevard  
**Parcel No.**  
**Township** **Range** **Section** **Base**

**Proximity to:**

**Highways** I-80  
**Airports**  
**Railways**  
**Waterways**  
**Schools**  
**Land Use** Commercial and Residential

**Project Issues** Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Economics/Jobs; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Cumulative Effects; Growth Inducing; Landuse

**Reviewing Agencies** Resources Agency; Department of Conservation; Department of Fish and Game, Region 2; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 3; Regional Water Quality Control Bd., Region 5 (Sacramento); Department of Toxic Substances Control; Native American Heritage Commission

**Date Received** 12/06/2007 **Start of Review** 12/06/2007 **End of Review** 01/22/2008

Note: Blanks in data fields result from insufficient information provided by lead agency.

**Letter  
1  
Response**

Governor's Office of Planning and Research, State Clearinghouse and Planning Unit,  
Terry Roberts, Director, State Clearinghouse  
1/24/08

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- 1-1** The commenter identifies when the Draft EIR was received by the State Clearinghouse and the agencies that reviewed the document. No additional response is necessary.

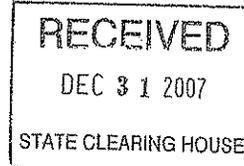
## NATIVE AMERICAN HERITAGE COMMISSION

915 CAPITOL MALL, ROOM 364  
 SACRAMENTO, CA 95814  
 (916) 653-4082  
 (916) 657-5390 - Fax



December 11, 2007

David Mohlenbrok  
 City of Rocklin  
 3980 Rocklin Road  
 Rocklin, CA 95677



RE: SCH# 2006112097 Rocklin Crossings Project; Placer County.

Dear Mr. Mohlenbrok:

The Native American Heritage Commission (NAHC) has reviewed the Notice of Completion (NOC) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archeological resources, the NAHC recommends the following actions:

- ✓ Contact the appropriate regional archaeological information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological information Center.
- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check. USGS 7.5-minute quadrangle name, township, range, and section required.
  - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. Native American Contacts List attached.
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez  
 Program Analyst

CC: State Clearinghouse

**Native American Contacts**  
Placer County  
December 11, 2007

Rose Enos  
15310 Bancroft Road            Maidu  
Auburn            , CA 95603    Washoe  
(530) 878-2378

United Auburn Indian Community of the Auburn Rancheria  
Jessica Tavares, Chairperson  
10720 Indian Hill Road            Maidu  
Auburn            , CA 95603    Miwok  
530-883-2390  
530-883-2380 - Fax

Todd Valley Miwok-Maidu Cultural Foundation  
Christopher Suehead, Cultural Representative  
PO Box 1490                            Miwok  
Foresthill            , CA 95631    Maidu  
tvmmcf@foothill.net  
(530) 367-3893 - Voice / Fax

United Auburn Indian Community of the Auburn  
Tribal Preservation Committee  
10720 Indian Hill Road            Maidu  
Auburn            , CA 95603    Miwok  
530-883-2390  
530-883-2380 - Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH# 2006112097 Rocklin Crossings Project; Placer County.

- 2-1 The assessment of cultural resource impacts included in the Draft EIR was conducted consistent with the requirements identified by the commenter.

On 11 December 2007, the California Native American Heritage Commission (NAHC) submitted a letter indicating its review of the Notice of Completion for the Rocklin Crossings project, and provided four categories of recommendations for determining impacts to cultural resources.

1. NAHC recommended that the appropriate Information Center be contacted for a records search to determine whether or not the property has been surveyed and whether or not recorded archaeological sites are located inside the project area.

ECORP conducted records searches with the North Central Information Center at California State University, Sacramento on 23 January 2003 and 16 February 2005. The record search results indicate that three cultural resource investigations have been conducted within the project area. The previous surveys resulted in the identification of three prehistoric sites, three historic sites, one prehistoric isolate, and two historic isolates. These resources are summarized in Table 4.13-1 of the Draft Environmental Impact Report and are reported in the survey report prepared for the project by ECORP (November 2005).

2. NAHC recommended that if the project area had not been previously surveyed, then a professional archaeologist prepare a confidential survey report to be submitted to the Information Center.

ECORP conducted a pedestrian survey of the project area in 2003 and prepared a technical survey report of the findings. As a result of the survey, no newly identified cultural resources were recorded. The results were transmitted to the North Central Information Center, with the testing and evaluation report, on 18 November 2005.

3. NAHC recommended that it be contacted to perform a sacred lands file check and for a list of Native American community members who may have comments about the project.

ECORP contacted NAHC on 31 October 2002 and 16 September 2004 to request a search of the sacred lands file. On 08 November 2002 and 24 September 2004, ECORP received responses from NAHC, indicating that the search failed to yield information on Native American cultural resources. The NAHC provided a list of community members, who were each contacted by letter on 09 January 2003 and 01 November 2004. Phone calls were subsequently made to each individual to solicit comments.

Rose Enos stated that if burials were identified during testing, she would like to be contacted again. The United Auburn Indian Community (UAIC) responded by letter on 18 November 2004 with a request that the bedrock milling stations be avoided during project implementation, and if that option is not possible, they are willing to discuss it further.

4. NAHC recommended that the lead agency include, as part of its mitigation plan, provisions for unanticipated discovery and monitoring of sensitive areas by an archaeologist and tribal monitor.

The Draft Environmental Impact Report provides measures for the management of unanticipated discovery of cultural resources, including the role of Native Americans (see Mitigation Measures 4.13-2

and 4.13-3 on page 4.13-12 of the Draft EIR). In addition, in response to the commenter's statement, the first sentence of Mitigation Measure 4.13-2 is hereby revised as follows:

**Mitigation Measure 4.13-2: Potential Impacts to Undocumented Cultural Resources.**

If an inadvertent discovery of cultural materials (e.g., unusual amounts of shell, charcoal, animal bone, bottle glass, ceramics, burned soil, structure/building remains) is made during project-related construction activities, ground disturbances in the area of the find shall be halted and a qualified professional archaeologist **and the United Auburn Indian Community (UAIC)** shall be notified regarding the discovery.

For more information regarding the cultural resource evaluation conducted for the proposed project, the commenter is referred to Section 4.13, Cultural Resources, of the Draft EIR.



11464 B Avenue, Auburn, CA 95603 • (530) 745-2330 • Fax (530) 745-2373  
www.placer.ca.gov/apcd Thomas J. Christofk, Air Pollution Control Officer

January 23, 2008

SENT VIA FAX 916-625-5195

Sherri Abbas  
Development Services Manager  
City of Rocklin  
3970 Rocklin Road  
Rocklin, CA 95677-2720

Subject: Notice of Public Review of a Draft Environmental Impact Report for the Rocklin Crossing Project (SCH# 2006112097)

Dear Ms. Abbas:

As you are aware, the City of Rocklin is located in the Sacramento Valley Air Basin, which is a non-attainment area for federal health based ambient air quality standards for ozone. In addition, this area is also classified as a non-attainment area for State ozone standards and non-attainment for State particulate matter standards.

Build out of this project will result in significant long-term air quality impacts and cumulative impacts in the City of Rocklin and Placer County.

The Placer County Air Pollution Control District (District) has specific comments on the Draft EIR as follows:

1. Please correct the URBEMIS model version for project related construction emission estimates on page 4.3-18. The model should be URBEMIS 2002 Version 9.2.
2. Please modify the last sentence of the last bulleted mitigation measure on page 4.3-19 as the follows:

Contractors can access the Sacramento Metropolitan Air Quality Management District's web site to determine if their off-road fleet meets the requirements listed in this measure. <http://www.airquality.org/ceqa/index.shtml#construction>. The contractor can provide the calculation spreadsheets to the District in electronic format for review and for project compliance.

3. Please incorporate the following mitigation measures to ensure the short-term construction emissions from the proposed project would be less than significant:
  - Clean earth moving construction equipment with water once per day.

- Install wheel washers or wash all trucks and equipment leaving the site.
- Reduce traffic speeds on all unpaved surfaces to 15 miles per hour or less.
- If possible, utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary diesel power generators.
- Develop a traffic plan to minimize traffic flow interference from construction activities.
- Employ construction activity management techniques, such as: extending the construction period outside the ozone season of May through October; reducing the number of pieces used simultaneously; increasing the distance between emission sources; reducing or changing the hours of construction; and scheduling activity during off-peak hours.
- The maximum daily grading acreage shall not exceed 6 acres. The type and number of off-road equipment used for each construction phase shall be consistent with the list of equipment proposed on page 4 in Appendix D.

The project related construction emissions would be below than significant thresholds based on the assumption of off-road construction equipment for URBEMIS modeling analysis. Therefore, the District requires the project constructor should use the similar type and number of equipment for construction activities in order to ensure the potential construction emissions being below the thresholds.

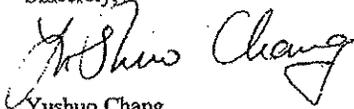
4. Please incorporate the following mitigation measures to mitigate the long-term operational emissions from the proposed project:

- All off-road equipment used for home improvement superstore (assumed it is Home Depot) and free-standing discount superstore (assumed it is Wal-Mart) for material handling or maintenance shall be natural gas, propane, or electric powered.
- The home improvement superstore shall only rent gasoline or natural gas pick-up trucks to customers.
- Only natural gas back-up generators can be installed.
- All heavy-duty (greater than 14,000 GVWR) delivery trucks used by major superstore tenants (Home Depot and Wal-Mart) shall use 1996 or newer models.
- All truck loading and unloading docks shall be equipped with one 110/208 volt power outlet for every two dock doors. Diesel trucks shall be prohibited from idling more than five minutes and must be required to connect to the 110/208 volt power to run any auxiliary equipment. Signage shall be provided.
- Signage shall be posted in the receiving areas and the parking lot to prohibit idling of for more than 5 minutes.
- HVAC units shall be equipped with PremAir (or other manufacturer) catalyst system, if available and economically feasible at the time building permits are issued. The PremAir system is considered feasible if the additional cost is less than 10 percent of the base HVAC system.

In addition, the District would suggest removing the *offsite mitigation program/in lieu of fee requirement* from page 6-45 under the Mitigation Measure 6.20 to page 4.3-21 under the Mitigation Measure 4.3-2. Because the proposed project will result in significant contribution for both of long-term operational and cumulative impacts, it is better to identify this measure first to mitigate the long-term operational emissions. It shall provide the best practice to offset the project related long-term operational to the maximum extent.

Thank you for the opportunity to comment the project. If you have any questions or concerns, please contact with me at (530)-745-2325.

Sincerely,

A handwritten signature in black ink that reads "Yushuo Chang". The signature is written in a cursive style with a large, stylized initial "Y" and a long, sweeping underline.

Yushuo Chang  
Senior Planner

- 3-1** The comments are consistent with the conclusions of the Draft EIR and no further response is necessary.
- 3-2** As stated in Table 4.3-3 on page 4.3-18 of the Draft EIR, the short-term construction emissions were modeled using the most recent California Air Resources Board-approved URBEMIS 2007 model Version 9.2 recommended by the Placer County Air Pollution Control District. The text in the first sentence of the second full paragraph on page 4.3-18 incorrectly references the 2002 version of the model. Therefore, in response to the commenter's statement, the first sentence in the second full paragraph on page 4.3-18 is hereby revised as follows:
- Short-term construction emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and CO were modeled using the ARB-approved URBEMIS **2007 Version 9.2** ~~2002 Version 8.7~~ computer program as recommended by the PCAPCD.
- 3-3** In response to the commenter's statement, the last sentence of the last bulleted mitigation measure on page 4.3-19 of the Draft EIR is hereby revised as follows:
- ~~Contractors can contact PCAPCD~~ **access the Sacramento Metropolitan Air Quality Management District's web site** to determine if their off-road fleet meets the requirements listed in this measure. **<http://www.airquality.org/ceqa/index.shtml#construction>**. **The contractor can provide the calculation spreadsheets to the District in electronic format for review and for project compliance.**
- 3-4** A discussion of the mitigation measures suggested by the commenter is included in the Master Response on Energy Conservation and Air Quality Mitigation included at the beginning of the responses.
- 3-5** A discussion of the mitigation measures suggested by the commenter is included in the Master Response on Energy Conservation and Air Quality Mitigation included at the beginning of the responses.
- 3-6** The project applicant is required to implement all of the mitigation measures included in the Draft EIR that are adopted as conditions of approval regardless of their location in the document. Therefore, Mitigation Measure 6-20 has not been relocated to Section 4.3, Air Quality, of the Draft EIR.



BOARD OF DIRECTORS      BUSINESS CENTER  
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Otis Wollan, District 5      PHONE  
David Brentinger, General Manager      530.823.4650  
Ed Tiedemann, General Counsel      800.464.0030  
WWW.PCWA.NET

January 22, 2008  
File No. WA/Rocklin

Ms. Sherri Abbas  
Development Services Manager  
City of Rocklin  
3970 Rocklin Road  
Rocklin, CA 95677

SUBJECT:      Comment on the Draft Environmental Impact Report for the Rocklin Crossings  
Project (SCH #2006112097)

Dear Ms. Abbas:

We have reviewed the Draft Environmental Impact Report (DEIR) for the Rocklin Crossings Project and have the following comments.

Page 4.6-5 of the DEIR (paragraph beginning "In the vicinity...") references providing water service to the project area from a pipeline in Taylor Road. Evaluation of the existing water system's ability to provide the projected project demands has established that a connection to Val Verde Road is a prerequisite to meet the maximum day and fire flow demands of the project. The Water Supply Assessment by PCWA (DEIR Appendix F, page 10 of 11) states "Proposed project demands and fire flow cannot be served from this (the Taylor Road) pipeline under Agency pressure and velocity criteria, therefore, off-site pipelines providing service from another transmission line will need to be constructed by the project." The transmission system connection to the Val Verde pipeline must be completed before water can be provided to the project. PCWA is currently working with the project proponents to enter into a Facilities Agreement to provide further CEQA analysis of the impacts of the specific pipeline route, prepare improvement plans, and construct the pipeline.

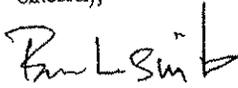
Page 4.6-14 (last paragraph) references that the PCWA improvements are intended to provide peak fire flows. This should be amended to state that the offsite improvements are necessary to provide either fire flows or maximum day demands, or both.

Page 4.6-17 of the DEIR (second paragraph) discusses relocation of a portion of PCWA's Eastside Canal. The document should be amended to note that this canal serves a number of PCWA raw water customers in the surrounding properties, and that reconstruction or relocation of the canal has the potential to affect PCWA's ability to serve these customers. The project will be required to maintain the ability to provide raw water service to existing customers served from lines affected by the project by maintaining current pressure and flow rates. Overflow easements must be provided from existing or relocated service boxes to approved locations.

W A T E R . E N E R G Y . S T E W A R D S H I P .

We appreciate the opportunity to comment on the Draft EIR. Should you have any questions, please contact Leslie Gault or Tony Firenzi of my staff at (530) 823-4886.

Sincerely,



R. Brent Smith, P.E.  
Deputy Director of Technical Services

RBS:LG:ly

2:\sec\ly\curr\jan 08

TOTAL P. 03

- 4-1 As discussed on page 4.6-14 of the Draft EIR, the Val Verde Road connection necessary for the project is one piece of Placer County Water Agency's (PCWA) master-planned water supply conveyance improvement project designed to reduce demand on the Taylor Road pipeline (which operates at capacity today). These PCWA water supply conveyance improvements are intended to ensure that PCWA's system can provide service for and meet the demands of not just the proposed project, but all developments that may be expected to occur within the area of benefit—the Sierra College Boulevard/Interstate 80 interchange area identified in Exhibit 4.6-2 on page 4.6-16 of the Draft EIR (including in excess of 300 acres of land in both Rocklin and Loomis)—without adversely affecting the pressure or velocity requirements of PCWA's system elsewhere.

The proposed project may accelerate the timing of the construction of certain PCWA improvements, but it does not cause them to occur. The construction of these improvements are not, therefore, a part of the Rocklin Crossings project. As PCWA planned infrastructure projects, the improvements are subject to analysis under CEQA separate from the Rocklin Crossings project. As PCWA notes, it is currently working with the project proponents to enter into a Facilities Agreement to provide the appropriate CEQA analysis of the impacts of the specific pipeline route, prepare improvement plans, and construct the pipeline. The Draft EIR provided a summary of the potential impacts which could occur with construction of these PCWA improvements because construction of the waterline must occur to serve this project and others. Since the pipelines would be installed within existing roadway rights-of-way, consistent with PCWA standards, no impacts on biological or cultural resources are anticipated. The temporary construction impacts, however, would be considered significant based on the air emissions, traffic delays and noise associated with trenching activities. The Draft EIR addresses these potentially significant impacts through Mitigation Measure 4.6-1, under which all mitigation measures recommended in Chapter 4 of the Draft EIR would be applied to mitigate any significant water conveyance construction impacts to less than significant levels.

- 4-2 In response to the commenter's statement, the last paragraph on page 4.6-14 of the Draft EIR is hereby revised as follows:

Off-site conveyance facilities are shown in Exhibit 4.6-1. These PCWA improvements are intended to ensure that PCWA's system can provide service for and meet the water demands (as it pertains to **either peak fire flows or maximum day demands, or both**) of the proposed project and other commercial developments that may or are expected to occur within the area of benefit, further identified as the Sierra College Boulevard/Interstate 80 interchange area (as depicted in Exhibit 4.6-2) without adversely affecting the pressure or velocity requirements of PCWA's system elsewhere.

- 4-3 In response to the commenter's statement, the second paragraph on page 4.6-17 of the Draft EIR is hereby revised as follows:

The project applicant would be required to relocate the Eastside Canal pipe that traverses the portion of the property abutting Interstate 80 within the project site. **The canal serves a number of PCWA raw water customers in the surrounding properties, and reconstruction or relocation of the canal has the potential to temporarily affect PCWA's ability to serve these customers.** PCWA would require the canal pipe to be relocated before construction of the proposed project to avoid being located under permanent structures. **The project would be**

**required to maintain the ability to provide raw water service to existing customers served from lines affected by the project by maintaining current pressure and flow rates.** The project applicant would be required to prepare plans and enter into a Facilities Agreement with the PCWA to relocate the canal pipe. **Overflow easements would be required from existing or relocated service boxes to approved locations.** The existing canal pipe would remain in service until the replacement pipe is in service.

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



January 14, 2008

David Mohlenbrok  
City of Rocklin  
3980 Rocklin Road  
Rocklin, CA 95677

RE: Rocklin Crossings Project, SCH# 2006112097

Dear Mr. Mohlenbrok:

As the state agency responsible for rail safety within California, we recommend that any development projects planned adjacent to or near the rail corridor in the City be planned with the safety of the rail corridor in mind. New developments may increase traffic volumes not only on streets and at intersections, but also at at-grade highway-rail crossings.

Of specific concern is the impact from increased traffic from this and other projects occurring in the area on the existing at-grade highway-rail crossing on Sierra College Boulevard.

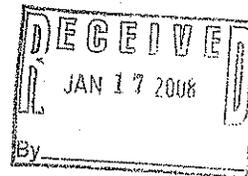
If you have any questions in this matter, please call me at (415) 703-2795.

Very truly yours,

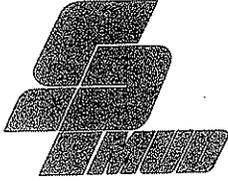
A handwritten signature in black ink, appearing to read "Kevin Boles".

Kevin Boles  
Environmental Specialist  
Rail Crossings Engineering Section  
Consumer Protection and Safety Division

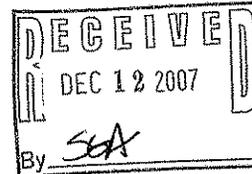
cc: Terrel Anderson, Union Pacific Railroad



- 5-1** Safety of the rail crossing is not impacted by additional traffic demand. The gates are actuated and remain down as long as necessary to allow trains to pass. The rail crossing gates are coordinated with the signal at the intersection of Sierra College Boulevard/Taylor Road, which provides sufficient clearance times to clear the intersection as well as the rail tracks before the gate closes.



**SOUTH PLACER  
MUNICIPAL UTILITY DISTRICT**



December 11, 2007

City of Rocklin  
Community Development Department  
3970 Rocklin Road  
Rocklin, CA 95677

Attention: Sherri Abbas

Subject: Rocklin Crossings Project  
D.E.I.R. (SCH #2006112097)

Dear Ms. Abbas:

The above property is within the service area of the South Placer Municipal Utility District, and is eligible for sewer service.

All sewer service which the District may hereafter provide to said lands or any portion thereof will be subject to all ordinances, resolutions, rules and regulations, taxes, charges, fees, and assessments of the SPMUD which may now or hereafter be in effect.

The design and construction of all on-site and off-site facilities which may be required as a result of this project, including the acquisition and granting of any necessary sewer easements, will be the responsibility of the developer/owner. All work shall conform to the Standard Specifications of SPMUD. Any required sewer trunk extension shall generally be in conformance with the District's Master Plan. Improvement plans shall be submitted to SPMUD for review and approval. It should be noted that substantial sewer construction may be required to serve the project. This project is anticipated to connect to and be served by those certain trunk sewer facilities planned to be built under the project commonly known as Croftwood. In the event Croftwood does not develop and construct those facilities, it will become the responsibility of the Rocklin Crossings project to construct said facilities in order to be sewerred.

This letter does not constitute a reservation of capacity in the District's sewage treatment facilities, nor does it constitute the assumption of a utility obligation to said lands or any portion thereof by the District.

P.O. BOX 45 - 3671 TAYLOR RD. • LOOMIS, CALIFORNIA 95650 • PHONE (916) 652-5877

City of Rocklin  
December 11, 2007  
Page – 2 –

Sewer connection permits will not be issued by the District until such time as all required sewer facilities have been constructed, and the sewers accepted by SPMUD. In addition to normal payment of the District's sewer participation fees for connections to the sewer, this project will be subject to payment of reimbursement fees to SPMUD under the terms of a refund agreement.

The District may be rendered unable to provide sewer service to said lands due to prohibitions or restrictions which may be imposed upon it by federal, state, county or local regulatory agencies having jurisdiction or due to conditions caused by an Act of God. Prohibitions and/or restrictions may be imposed at the Regional Wastewater Treatment Plant on the plant's capacity in accordance with existing agreements; this may also impact the District's ability to accept new applications for sewer service for the project. No restrictions currently exist.

This letter shall be of no force or effect after the expiration of 365 calendar days from the date hereof, but may at the discretion of the District, be renewed or extended upon application of the developer/owner of the land referred to herein or their agent.

All non residential development within SPMUD is subject to the requirements of the City of Roseville Industrial Waste Pretreatment Program in accordance with Ordinance 14.26 of the Roseville Municipal Code.

Sincerely,



Dari Burbano  
Engineering Technician

DB:jg

- 6-1** The commenter's statements that sewer service for the proposed project would be subject to all ordinances, resolutions, rules and regulations, taxes, charges, fees, and assessments of the South Placer Municipal Utility District (SPMUD), and that the design and construction of sewer facilities to serve the project site would be the responsibility of the project applicant are noted. It is further noted that in the event the approved Croftwood subdivision does not construct necessary trunk sewer facilities, their construction would become the responsibility of the proposed project. The commenter states that sewer connection permits will not be issued by SPMUD until such time as all sewer facilities have been constructed and accepted by SPMUD. The commenter also identifies potential limitations that could affect the ability of SPMUD to provide sewer service to the site. The commenter does not raise any substantive comments on the contents of the Draft EIR or otherwise raise a significant environmental issue; therefore, no additional response is necessary.

MIWOK  
MAIDU

United Auburn Indian Community  
of the Auburn Rancheria

JESSICA TAVARES  
CHAIRPERSON

KIM DUBACH  
VICE CHAIR

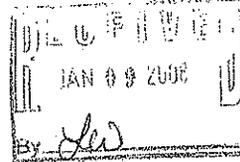
DAVID KEYSER  
SECRETARY

DOLLY SUEHEAD  
TREASURER

GENE WHITEHOUSE  
COUNCIL MEMBER

January 3, 2008

City of Rocklin  
Sherri Abbas, AICP  
Development Services Manager  
3970 Rocklin Road  
Rocklin, CA 95677-2720



Subject: Draft Environmental Impact Report for the Rocklin Crossing Project  
(SCH# 2006112097)

Dear Ms. Abbas,

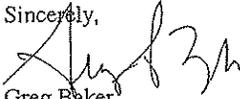
Thank you for the opportunity to review the document referenced above. The United Auburn Indian Community (UAIC) is comprised of Miwok and Maidu people whose traditional homeland includes Placer and Nevada counties, as well as some surrounding areas. The UAIC is concerned about development within ancestral territory that has the potential to impact sites and landscapes that may be of cultural or religious significance.

The Tribe previously submitted a letter dated November 21, 2006 regarding the proposed project. Among other items, this letter recommended that the project be designed to incorporate known cultural sites into open space or other protected areas. We understand that three prehistoric archaeological sites consisting of bedrock mortars have been identified within the project site. Although none of the prehistoric resources were determined to be eligible for listing on the California Register of Historical Resources or the National Register of Historical Places, we recommend that they be protected during implementation of the proposed project.

We also request that, in the case of an inadvertent discovery, the UAIC be notified immediately in addition to a qualified professional archaeologist. If the find is determined to be legally significant by the archaeologist, or culturally important to the Tribal community, project representatives should meet with the archaeologist and the Tribe to determine the appropriate course of action.

Thank you again for the opportunity to comment on the Draft EIR. If you have any questions please contact Shelley McGinnis at Analytical Environmental Services (916-447-3479).

Sincerely,

  
Greg Baker,  
Tribal Administrator

CC: Shelley McGinnis, AES

Tribal Preservation  
U.A.I.C. 10720 Indian Hill Road Auburn, CA 95603 Ph: 530-883-2320 / Fax: 530-885-6314

**7-1** Based on previous studies, as well as EDAW archival and field investigations, three prehistoric archaeological sites, one isolated prehistoric artifact, and five historic-era cultural resources have been identified within the project site. The three early Native American sites, the isolated prehistoric artifact, and the five historic-era resources were evaluated to determine their eligibility for listing on the California Register of Historic Resources (CRHR) (or the National Register of Historical Places). None of the prehistoric or historic-era resources located within the project site (inclusive of the detention basin area) was determined to be eligible for listing on the CRHR (or the National Register of Historical Places) and none of them were considered to be unique archaeological resources (as defined in Public Resources Code, Section 21083.2) due to a lack of association with historically significant persons or events, a lack of historical integrity, and/or a lack of data potential. Therefore, no significant cultural or historical resources would be affected by project implementation and no impacts on cultural resources would occur with development of the project.

Two of the three prehistoric archaeological sites identified within the project boundaries were likely removed during the grading activities for the improvements to the Interstate 80/Sierra College Boulevard Interchange. This separate project included use of nearly 50% of the project site to accommodate interchange improvements and a soil borrow area. Two of the three prehistoric archaeological sites were located within this excavation area. The excavated soils from the project site are being used to construct the interchange's elevated freeway on- and off-ramps. The last remaining prehistoric archaeological site is anticipated to be removed during site grading for the proposed project.

With regard to the request that the United Auburn Indian Community be notified in the event of an inadvertent discovery, Mitigation Measure 4.13-2 has been amended to include a requirement to consult with the United Auburn Indian Community (UAIC), in addition to the qualified professional archaeologist, in the event of an inadvertent discovery. If, however, human remains are discovered, the provisions in Mitigation Measure 4.13-3 remain as stated: the NAHC will determine the identity of the Most Likely Descendent.

**Case Details**

[Print](#) [Close](#)

Case Number: 19021

Status: New

Customer: Anonymous  
external customer

Location of Request:

Preferred Contact Method: None

Request Type: Suggestion

Submitted By: Anonymous  
customer

Primary Owner: Abbas, Sherri

Topic: Planning  
Commission>Planning  
Commission

Date/Time Created: 01/14/2008 18:27

Date/Time Closed:

**Original Request**

As a resident of Rocklin, I oppose the proposed WalMart at Sierra College and I-80. We do not need such a large box store in our community. It does not fit with the character of our town. I will not and do not shop at Walmart.

**Customer Communications**

No records of communication activities found

**Internal Activity**

**Internal Notes**

No records for internal activities found

**Tasks**

Complete	Due	Subject	Assigned By	Assigned To	Status
No records found					

**Case Contacts**

Role	Name	Email	Phone
Primary Owner	Abbas, Sherri	Sherri.Abbas@rocklin.ca.us	
Secondary Owner	Richardson, Terry	Terry.Richardson@rocklin.ca.us	

**Attachments**

No attachments found

**Activity History**

No activity history recorded

- 8-1** The commenter's opposition to the proposed project is noted. The commenter does not raise any substantive comments on the contents of the Draft EIR or otherwise raise a significant environmental issue; therefore, no additional response is necessary.



Tasks	eFM	Customers	Setup	Help	New Features!	Welcome, David Mohlenbrok · LOGOUT
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EFM

eFeedbackManager

eFM Cases

New Request

Advanced Search

« Back to Case List

Case Details

View Print Version

Case Number: 19051

Status: Resolved

Customer: **Claiborne, Anna**  
 external customer  
 5715 Arrowhead  
 Rocklin CA 95677 (map)  
 anna.claiborne@gmail.com

Location of Request:

Preferred Contact Method: Email

Request Type: Question

Submitted By: **Claiborne, Anna**  
customer

Primary Owner: Abbas, Sherri

Topic: Planning  
Commission>Planning  
Commission

Date/Time Created: 01/23/2008 16:57

Date/Time Closed: 01/23/2008 17:11

Original Request

Mr. David Mohlenbrok  
Attn: Sherri Abbas  
City of Rocklin  
3970 Rocklin Road  
Rocklin, CA 95677

Re: Draft Environmental Impact Report for the Rocklin Crossings Project

Dear Mr. Mohlenbrok,

The proposed Rocklin Crossing/Rocklin 60 developments have numerous problems, some of the more prominent being no open space, parks, or preservation of wetlands. It also places a commercial development directly adjacent to a residential development and allow Wal-Mart to build on of the largest retail stores in California.

Due to the flaws in the proposed development, I am forced to ask some general questions: Why are we allowing Wal-Mart to build such a large store when they have stated they are now launching smaller stores in California? Why are we building another Wal-Mart with 5 miles of 2 existing Wal-Marts? Why are we allowing a corporation back into our community that has already abandoned it once? What is to prevent Wal-Mart from leaving again?

There are also several specific questions I have on the Draft Environmental Report:

Land Use

This project requires rezoning of Medium Density Residential land to Retail Commercial. It also

requires rezoning of previously unzoned land to Planned Commercial Development. There is no significant amount of land planned for open space. The zoning of Planned Commercial Development is intended to have the specific purpose of encouraging the preservation of open space. With no significant open space listed, how does this plan conform to the definition of its zoning?

The city of Rocklin's policies state that they encourage the protection of wetlands. However, this project requires that .5 acres of wetlands be filled and destroyed. How is the destruction of wetlands consistent with the city policy of protection?

City policy also encourages the protection oak trees, including heritage oaks. This development requires all trees in the development area be destroyed including heritage oaks. How is the removal of every tree consistent with the cities policy of protection?

The city of Rocklin's General Plan Use Policy 7 states: No incompatible land uses are to be placed in close proximity with residential developments. Incompatible uses include intense commercial or industrial developments...For example...24 hour operations... Is there anymore intense commercial usage than a Wal-Mart? The General Plan Use Policy specifically states 24 hour operations. How is placing residents homes adjacent to an intense 24 hour commercial development not in direct violation of the General Plan Use Policy?

#### Traffic

The Rocklin Crossing project will add approximately 18,000 additional daily trips to its surrounding roadways, including Pacific St, Rocklin Rd., Sierra College Blvd, Dominguez Rd., and Taylor Rd., to name a few. Does any amount of "mitigation" sound acceptable for this many additional cars?

General Plan policy 13 that the city strives to maintain minimum traffic level of service C, yet the traffic analysis concludes that five intersections will be downgraded to unsatisfactory D, E, and F ratings. How is this consistent with the policy 13?

The project traffic levels and LOS are all based on adding to current traffic levels and/or adding to approved project levels. The DEIR studies do not take into account the additional traffic which will be generated by other "pending" developments in the surrounding areas which will effect many of the same intersections such as Clover Valley Lakes or the retail development proposed on Americana Dr. Why hasn't a comprehensive traffic analysis been done to take into account the impact of all these concurrent developments? What would this traffic study look like with the levels from other studies taken into account? What would be the LOS on all intersections with overlapping impact from these concurrent developments?

What is the amount of the SPRTA fee? How much will tax payers end up paying for roadway improvements related to this project? How much will SPRTA be contributing for these improvements? Where does the SPRTA funding come from?

#### Air Quality

The replacement ratio of trees on this site is only 2:1. Considering the harm to air quality from this shopping center, why isn't the replacement higher? The trees being removed are heritage oak tress, meaning they are large mature trees. It will take several years for the newly planted trees to reach the same positive environmental impact. Why hasn't this lag time been better accounted for by a much high ratio?

The Rocklin Crossing residential development appears to consist of family homes, meaning many children in the development. The location of the commercial development in respect to the residential, and the delivery trucks associated with the commercial development, place the residences in an area with elevated toxic emissions. How is it a good idea to place children's homes in such close proximity to toxic emissions from delivery trucks?

#### Noise

#### Population & Housing

The vacancy rates, growth rates, and housing unit numbers are from studies done in the years 2000 through 2004. Due to the current down turn in the economy and rising foreclosure rates, are these numbers still even relevant? Shouldn't more current numbers be used to more accurately reflect the state of the city?

The projected housing needs also come from the year 2004 when the housing "boom" was occurring. Given the current state of the housing market in both Placer County and Rocklin, should these numbers be adjusted to reflect current conditions?

The numbers used for employment are from the year 2004. Considering the layoffs during 2005 and 2006 of some of the largest area employers listed (HP, NEC, Oracle), shouldn't these numbers be adjusted to reflect 2007 rates?

Rocklin Policy LU-37 states: To attract job generating land uses that will provide a variety of employment opportunities for those who live, or are likely to live, in the community... The average Wal-Mart workers salary is approximately \$17K per year. The median home price in Rocklin is \$449,000 according to the document. How can any of these workers afford to live in Rocklin? How will Wal-Mart provide jobs within the community if those that work there can not afford to buy homes in Rocklin? Isn't this discrepancy in direct violation of the city policy stated?

**Aesthetics**

The DEIR report lists the effects of additional lighting from the project as significant. The mitigation measures include aiming fixtures downward, submitting a lighting report, and adhering to city guidelines. Merely driving by any 24 hour Wal-Mart at night can clearly demonstrate these "mitigation" measures are not effective in the least. Has the city considered the option of scaling the Wal-Mart down to normal business hours to reduce the amount of night time light pollution?

Anna Claiborne

**Customer Communications**

Date	From	Text
01/23/2008 17:11	Abbas, Sherri	Dear Ms. Claiborne Your comments on the Crossings DEIR will be responded to in the Final EIR. You will be notified when it is available. Sherri Abbas Development Services Manager

**Internal Activity**

**Internal Notes**

No records for internal activities found

**Tasks**

Complete	Due	Subject	Assigned By	Assigned To	Status
No records found					

**Case Contacts**

Role	Name	Email	Phone
Primary Owner	Abbas, Sherri	Sherri.Abbas@rocklin.ca.us	
Secondary Owner	Richardson, Terry	Terry.Richardson@rocklin.ca.us	

**Attachments**

No attachments found

**Activity History**

<i>Date</i>	<i>Event</i>	<i>Description</i>
01/23/2008 17:11	Change Status	status change during send email

- 9-1** With the exception of 1.23 acres, the project site has been planned and zoned by the City for commercial uses and the project proposes to develop the site with commercial uses. Individual store sizes are typically determined based on the individual needs of the anticipated building tenants and the site's specific zoning restrictions. The decision of individual tenants to lease space within the proposed development is solely within their own discretion based on their interpretation of the business climate and market conditions. These tenants also have the right to relocate their businesses or terminate business operations as they see fit. Therefore, there is no guarantee that individual tenants will remain indefinitely within the proposed project site. Notably, in general, local decision-makers generally need not concern themselves, under CEQA or otherwise, with the identity of tenants within retail projects, but rather should focus instead on the land uses at issue and their effects. (*Maintain our Desert Environment v. Town of Apple Valley* (2004) 124 Cal.App.4th 430, 443-444, citing *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4th 1004, 1014.) For a discussion of the appropriateness of the project at the location being proposed, the commenter is referred to the Land Use Master Response.
- 9-2** The Planned Development - Commercial (PD-C) zoning is intended to provide the means for greater creativity and flexibility in environmental design than is provided under the strict application of the zoning and subdivision ordinances, while at the same time protecting the public health, safety and welfare and property values. Although encouraging the preservation of open space is one of the purposes of the PD-C zoning, it is not the only purpose. The other purposes include the following: 1) Promote and encourage cluster development on large sites to avoid sensitive areas of property; 2) Encourage creative and innovative design on large sites by allowing flexibility in property development standards; 3) Accommodate various types of large scale, complex and phased developments; and 4) Establish a procedure for the development of large tracts of land in order to reduce or eliminate the rigidity, delays, and conflicts that otherwise would result from application of zoning standards designed primarily for small lots.
- In addition, the City General Plan includes specific goals and policies for commercial land uses that do not specifically require the inclusion of open space within commercial developments. The project's consistency with the General Plan's commercial land use goals and policies is discussed in detail on pages 4.1-8 through 4.1-10 of the Draft EIR.
- 9-3** On May 16, 2007, the project applicant secured authorization for the fill of approximately 0.426 acre of jurisdictional waters of the United States (Nationwide Permit #39). Prior to the commencement of any construction activities associated with the proposed project, the project applicant will be required to comply with all of the terms and conditions of the Nationwide Permit. This includes compensating for the acreage of wetlands filled with project implementation in order to ensure no net loss of wetland resources. The project applicant proposes to compensate for wetland removal through the purchase of appropriate wetland credits (i.e., 0.426 acre of seasonal wetlands) from an agency-approved mitigation bank or through a contribution to an In-lieu Fee Fund. By replacing the wetland resources removed with site development, the proposed project would be consistent with the City's wetland protection policies, which allow for implementation of appropriate mitigation measures where avoidance is not feasible.
- 9-4** As stated on page 4.12-22 of the Draft EIR, the proposed project would result in the removal of all of the native oak trees on the site, including two heritage trees. In the short-term, the removal of these trees would be considered a significant and unavoidable impact because the removed trees would not be immediately replaced with mature oak trees. However, in the long-term, the trees removed with site

development would be replaced at a minimum of a 2:1 ratio and/or the project applicant would be required to contribute to the City of Rocklin's Oak Tree Preservation Fund, consistent with the City's Oak Tree Preservation Ordinance. Per the City's Oak Tree Preservation Guidelines, funds deposited into the Oak Tree Preservation Fund shall be used for the following purposes only: 1) acquisition of land deemed appropriate for oak tree reforestation; 2) activities related to the planting, acquisition and maintenance of oak trees; 3) compensation of arborists retained by the City in connection with the administration of this chapter and any related programs; 4) oak tree preservation educational programs, and 5) activities related to the administration of this fund and the Oak Tree Preservation Ordinance. The City of Rocklin commissioned the firm of Phytosphere Research to evaluate, characterize, and make recommendations on the City's urban forest, and from that effort, a 2006 report titled "Planning for the Future of Rocklin's Urban Forest" was produced. One of the findings of this report was that the City's overall tree canopy cover has increased from 11% in 1952 to 18% in 2003 (a 63% increase) due to the protection of existing oaks and growth of both new and existing trees. This finding supports the City's on-going practice of requiring mitigation for oak tree removal through its Oak Tree Preservation Ordinance as being an effective way to maintain or even increase urban forest canopy.

The project's long-term impact on oak trees would be reduced to a less-than-significant level once replanted trees become established and mature. By complying with the oak tree replacement requirements consistent with the City's Oak Tree Preservation Ordinance, the proposed project would be consistent with the City's oak tree preservation policies. Nothing in the City's ordinance requires the preservation of every tree on a proposed development site. Rather, the ordinance allows the cutting of trees with proper mitigation. In addition, a given project need not be in perfect conformity with each and every General Plan policy (*Sequoyah Home Owners Assn. v. City of Oakland* (1993) 23 Cal App. 4th 704, 719 (*Sequoyah*)).

- 9-5** The commenter references a land use policy that does not exist in either the existing 1991 City of Rocklin General Plan or the 2005 City of Rocklin Draft General Plan Update. The 1991 General Plan contains a Policy 7 for new residential land use that states "To require that new development in or near existing residential areas be compatible with those existing neighborhoods.", but that policy does not apply to the proposed retail commercial project. For the policies that are applicable to the proposed project, the commenter is referred to the April 1991 City of Rocklin General Plan. For a discussion of the project's consistency with the General Plan's commercial land use policies, the commenter is referred to page 4.1-12 of the Draft EIR.
- 9-6** The Rocklin Crossings project does add approximately 18,000 additional trips to its surrounding roadways. The level of service (LOS) analysis of the intersections, for peak hour (a.m. and p.m. peak) conditions (highest traffic for a continuous 60 minute period) show that the project impacts can be mitigated to less-than-significant levels (with recommended mitigation measures) consistent with City policy. In previously imposing commercial general plan and zoning designations on the subject property, the City implicitly recognized that, once the property was developed consistent with these designations, vehicular traffic would result.
- 9-7** General Plan policy 13 states that "To maintain traffic level of service "C" for all streets and intersections, except for intersections located within ½ mile from direct access to an interstate freeway where a level of service "D" will be acceptable. Exceptions may be made for peak hour traffic where not all movements exceed the acceptable level of service". Consistent with the policy, eleven intersections (out of 21) were within ½ mile of direct freeway access and the minimum permitted traffic level of service for these intersections is "D". The intersections that are forecast to operate at unsatisfactory level of service (D, E, and F) are not downgraded to unsatisfactory conditions due to project traffic. Where ever the intersections are downgraded to unsatisfactory conditions due to project traffic, an appropriate mitigation measure is proposed. None of the impacts anticipated in the Draft EIR creates a violation of General Plan Policy 13.

- 9-8** The commenter is mistaken. The traffic study includes an analysis of two time horizons: a Baseline which is a near term condition including existing traffic levels, traffic from a list of approved projects at the time the Rocklin Crossings project EIR was initiated, and new project traffic; and a second horizon, 2025, when all development considered in the Rocklin and surrounding communities' General Plans is included. The approved project list was finalized in November 2006 and all the geographically-relevant approved projects at that time were included in the list. Any project that was submitted to the City after November 2006 was not included in the approved project list. The Clover Valley Lakes project was not yet approved in November 2006 and was therefore not included in the Baseline analysis. By virtue of its underlying zoning and land use designations, however, development of the Clover Valley property was included in the 2025 analysis. It is unclear what is being referenced by the retail development on Americana Drive portion of the comment (the area off of Americana Drive is designated for Light Industrial uses); however, the 2025 analysis includes consideration of the all of the adopted General Plan land uses for the City, including the Clover Valley area and the Americana Drive area, and therefore, consideration of this cumulative traffic is reported in the 2025 traffic impact analysis.
- 9-9** The South Placer Regional Transportation Authority (SPRTA) fee amount applies to new development and is based on the size and type of development. The current SPRTA fee is \$2,111 per equivalent dwelling unit. A single family home is considered to be one (1) equivalent dwelling unit. Taxpayers will not pay anything towards the improvement of Sierra College Boulevard to six (6) lanes. The SPRTA fee will pay for one additional travel lane in each direction, while the third travel lane, shoulder and frontage improvements will all be the responsibility of the developer. SPRTA will contribute approximately \$7.12 million for the design of improvements to Sierra College Boulevard from just south of Taylor Road to Granite Drive, and the construction of improvements from Sierra College Boulevard from just south of the new interchange at Interstate 80 (I-80) to just north of El Don Drive. The SPRTA funding comes from the collection of the SPRTA fee at issuance of building permits for residential, commercial, office and industrial projects within the communities of Rocklin, Roseville, Lincoln and south Placer County. For Fiscal Year 2006/07, the total fee collected was \$5,351,538. Since its inception in mid-2002, total SPRTA fees collected through October 2007 is approximately \$29 million.
- 9-10** The oak tree replacement ratio identified in the Biological Resources Section (Section 4.12) of the Draft EIR is consistent with the requirements of the City's Oak Tree Preservation Ordinance, and does account for the lag time mentioned by the commenter. Based on the native oak tree surveys conducted for the site, approximately 221 native oak trees would be removed from the site with project implementation. Of the 221 trees to be removed, two are identified as heritage oak trees, which are oak trees native to the Rocklin area with a diameter at breast height of 24 inches or greater. In the short-term, the removal of these trees would be considered a significant and unavoidable impact because the removed trees would not be immediately replaced with mature oak trees. Increasing the replacement ratio would not eliminate this short-term impact because it would not accelerate the growth of replacement trees. However, in the long-term, the trees removed with site development would be replaced at a minimum of a 2:1 ratio and/or the project applicant would be required to contribute to the City of Rocklin's Oak Tree Preservation Fund, consistent with the City's Oak Tree Preservation Ordinance. The commenter is referred to Response to Comment 9-4 for more information regarding the City's Oak Tree Preservation Ordinance and its applicability to the proposed project. Because the proposed 2:1 replacement ratio would be consistent with the City's Oak Tree Preservation Ordinance, the project's long-term impact on oak trees would be less than significant and a higher replacement ratio would not be necessary.
- 9-11** The commenter is assumed to be referring to the proposed Rocklin 60 residential development, which would be located directly east of the Rocklin Crossings project. A Health Risk Assessment was prepared to determine the exposure levels for the possible future residents within the proposed Rocklin 60 residential development due to their direct proximity to the project site. The Health Risk Assessment is attached as Appendix C to this Final EIR. Based on the modeling results included in the Health Risk Assessment, the lifetime cancer risk associated with operation of the proposed project was identified for

the individual residences within the proposed Rocklin 60 residential development. The highest lifetime cancer risk for an individual residence was identified as 5.1 in a million. For the majority of the residences, the cancer risk level was identified as 1 in a million or less. These estimated cancer risk levels are conservatively based on a hypothetical individual exposed to carcinogenic emissions from the project site continuously, 24 hours per day, 365 days per year for a 70-year lifetime, which is very unlikely to occur in reality. Based on these calculations, the lifetime cancer risk associated with operation of the proposed project for the residences within the proposed Rocklin 60 residential development would not exceed the Placer County Air Pollution Control District cancer risk significance level of 10 in a million. Therefore, less-than-significant health risk impacts would be anticipated for residences within the Rocklin 60 residential development.

**9-12** The 2000 Census data and other studies were utilized because they were the most recent published data that was available. Based on the changing employment and housing conditions within the City of Rocklin and the State as a whole, unemployment has increased and housing has become more affordable when compared to the statistics included in Section 4.5, Population and Housing, of the Draft EIR. The Draft EIR stated on page 4.5-4 that the proposed project would generate new employment within the City of Rocklin, which could contribute to the demand for housing. However, the Draft EIR concluded that the proposed project's contribution to population growth and its effect on available housing supply within the City would be considered a less-than-significant impact due to the relatively high median home prices within the City and the majority of the project's employment consisting of lower-paying service/retail jobs that would likely originate from outside of the City. Because the affordability of housing within the City is increasing rather than decreasing, a greater number of homes are presumably available for new residents. This fact would further diminish the project's effects on the City's housing supply because the City currently has a greater capacity to absorb new residents. Therefore, the proposed project would continue to have a less-than-significant impact on the City's housing supply.

**9-13** Regarding the commenter's references to Rocklin Policy LU-37, this policy is from the 2005 Draft General Plan Update. The Draft General Plan Update has not been adopted by the City of Rocklin; therefore, the policies included in the update are not applicable to the proposed project. For the policies that are applicable to the proposed project, the commenter is referred to the April 1991 City of Rocklin General Plan. For a discussion of the project's consistency with the General Plan's commercial land use policies, the commenter is referred to page 4.1-12 of the Draft EIR

As discussed on page 4.5-4 of the Draft EIR, the proposed project would generate new employment within the City of Rocklin. At full buildout, the site is expected to employ approximately 800 people. The employment growth anticipated with the proposed project would represent an increase in total employment within the City of approximately 3.2%. However, due to the project's location along the primary transportation corridor within Placer County, employees for the project would be drawn from throughout the region. Also, due to the relatively high median home prices within the City and the majority of the project's employment consisting of lower-paying service/retail jobs, only a relatively small percentage of the project's employees may come from within the City. Employees would logically be expected to reside in communities along the Interstate 80 corridor in both Placer and Sacramento counties. Due to the density of urban development within these communities, a wide variety of housing options are available for project employees. For Placer County in particular, the rental unit vacancy rate was 6.4% in 2000.

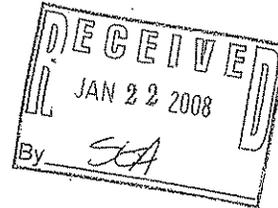
**9-14** Construction and operation of all of the proposed buildings on the site would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building. Large retailers have responded to these requirements and the rising cost of energy by increasing the energy efficiency of their retail establishments. Wal-Mart in particular includes a variety of energy efficient design components in

its stores including night dimming, in which the project's internal lighting is dimmed to approximately 65% of typical evening illumination during the late night hours. Night dimming for the project's two major retail tenants, in combination with the lighting mitigation measures included in the Draft EIR, would substantially reduce the project's anticipated nighttime light impacts. Please also see Response to Comment 43-4

As discussed in Responses to Comments 43-3 and 43-4, the 24-hour retail operations at the project site would not cause significant environmental impacts that could not be mitigated. Because the Draft EIR concluded that the nighttime lighting impacts would be reduced to a less-than-significant level, reducing the retail hours of operation would not substantially lessen the project's environmental impact, and it was not necessary for the Draft EIR to consider an alternative that prohibits the 24-hour operation of the proposed Wal-Mart Supercenter.

January 19, 2008

Sherri Abbas  
Development Services Manager  
39 70 Rocklin Rd.  
Rocklin, CA 95677



Regarding Rocklin Crossings Development

We are long time residents of Dias Ln, which is in close proximity to the proposed Rocklin Crossings Development and the proposed Rocklin 60 residential development. We believe that the environmental impact of these two projects, need to be considered together in regard to their **cumulative impact**.

Also, the DEIR says that a break in the eastern perimeter wall is proposed to provide an emergency vehicle/pedestrian access to the property to the east, located near the northern terminus of the large commercial building. This proposal seems rather vague. Our concern is that this **"emergency access" may be accessed on Dias Lane, used as a regular cut through, and have an impact on the traffic of our dead end lane**. The DEIR needs to address this issue in detail. During the 31 years that we have lived on Dias Ln., the responsibility of the maintenance of the road way has been charged to the property owners of Dias Ln. because they are the primary users of this private road. If Dias Lane is turned into a public access road, who will maintain it? Are you aware of the fact that one side of Dias Ln is in Loomis, and the other side is in Rocklin?

Another concern of ours is the effect that these projects will have on the **salmon in Secret Ravine Creek**. We have observed a huge decline in the number of salmon in the creek in the last two years. Where as we saw many many salmon coming up the creek to spawn in 2005, we have not seen any salmon this winter or last. This seems to be a result of the construction taking place on the Croftwood Development. How long will it take for Secret Ravine to recover from the adverse effects of this construction project and for the salmon to return? Could it ever recover from the added impact of the new interchange and The Rocklin Crossings Development, and the Rocklin 60 Residential Development? The DEIR needs to check out the following sources in considering the impact of these developments on salmon in Secret ravine creek.

**Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA) - Project Brief UC Santa Barbara (June 2003)**

Secret Ravine is a 10.5 mile-long creek located east of Interstate-80 in Placer County. The stream is part of the upper Central Valley watershed, and is a tributary of Dry Creek, which drains into the Sacramento River. Secret Ravine supports a population of fall-run chinook salmon, but has experienced an estimated tenfold decline in the last forty years, a rate even higher than the similar decline trend of chinook salmon in the Central Valley over this same time period.

**A benthic macro invertebrate survey of Secret Ravine: the effects of urbanization on species diversity and abundance UC Berkeley (2003)**

The population in Placer County, California, is growing four times faster than the state of California. With the increase in population come a large increase in impervious surfaces such as residential developments, strip malls, roads, and a probable decline in local stream water quality. To test whether the recent developments have impacted a local stream, we

(downstream) reach of Secret Ravine.

**Secret Ravine Adaptive Management Plan - A Placer County Tributary of the Dry Creek Watershed** Dry Creek Conservancy (December 2001)

The goal of the Secret Ravine Adaptive Management Plan is to define a process to restore the approximately 10 miles of instream and riparian habitats between Rock Springs Road and the confluence with Miners Ravine to sustain native terrestrial and aquatic species of Dry Creek Watershed, and to help meet the Central Valley Project Improvement Act (CVPIA) goal to double natural production of Chinook salmon and steelhead.

Another issue is the **loss of wetlands**. Buying and maintaining wetlands in another part of the state may meet the legal requirement for mitigating our loss of wetlands, but it does not help mitigate the loss that we would experience on these 55+ acres in our own neighborhood.

Neither is there anything that could be done to mitigate the loss of homes for the wildlife that live there. Since the construction started at the Croftwood development, we have had many more deer, turkeys, coyotes, and other wildlife move upstream. Where will they go if they lose another 55+ acres of their homeland? The DEIR does not preserve the "homeland security" of our wildlife and native plants and oak trees. In fact it admits that " *The proposed project would result in significant impacts related to the loss of wetlands, the loss of native oaks and heritage trees, the loss of valley elderberry longhorn beetle habitat, the disturbance of raptors and migratory birds, and degradation of fish habitat.*"

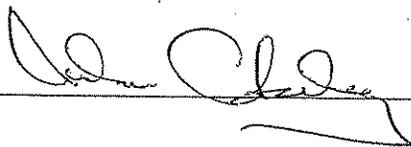
In regard to **Cultural resources**, the DEIR states that Native Americans have been contacted and did not respond. Are you sure that they received your letters. The reason we ask this question is that we and our neighbors were supposedly sent letters by the Corp of Engineers to give us an opportunity to comment on the proposed Rocklin 60 project. None of us received those letters. It was not until we found out (after the time expired for us to comment) the content of the letter and requested more time, that we were had the opportunity to respond.

DEIR needs to make sure that Native Americans have actually received an opportunity to respond before dismissing the artifacts that have been found as being insignificant. Even if the cultural resources that were found within the project are not eligible for listing on the California Registry of Historical Resources, why would Rocklin allow those historical resources to be destroyed? Is that why we observed an Indian grinding site marked (as if to preserve it) in the Croftwood project, and then later observed that it was covered up? Is this an example of how Rocklin is protecting our history?

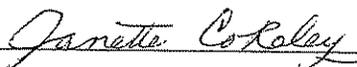
If you must have a shopping center, consider a smaller alternative, cutting it down at least by half the size, with a Village concept, and leave out the big box stores. Leave room to preserve some open space for our wetlands, wildlife, and natural and historical resources.

Sincerely,

Arlan Cokeley



Janette Cokeley



4223 Dias Ln

Loomis, CA 95650

University of California, Santa Barbara  
Donald Bren School of Environmental Science and Management

**Assessment of Stressors on Fall-Run  
Chinook Salmon in Secret Ravine  
(Placer County, CA)**

A Group Project Submitted in Partial  
Satisfaction of the Requirements for the

Degree of Master's of Environmental Science and Management

June 2003

**Researched and Written by:**

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**Prepared for:**

Office of Environmental Health Hazard Assessment (OEHHHA) at California EPA and  
the Placer County Planning Department

## Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)

As authors of this Group Project report, we are proud to submit it for display in the Donald Bren School of Environmental Science & Management library and on the web site such that the results of our research are available for all to read. Our signatures on the document signify our joint responsibility to fulfill the archiving standards set by the Donald Bren School of Environmental Science & Management.

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The mission of the Donald Bren School of Environmental Science and Management is to produce professionals with unrivaled training in environmental science and management who will devote their unique skills to the diagnosis, assessment, mitigation, prevention and remedy of the environmental problems of today and the future. A guiding principle of the School is that the analysis of environmental problems requires quantitative training in more than one discipline and an awareness of the physical, biological, social, political and economic consequences that arise from scientific or technological decisions. The Group Project is required of all students of the Master's of Environmental Science and Management (MESM) Program. It is a three-quarter activity in which small groups of students conduct focused, interdisciplinary research on the scientific, management and policy dimensions of a specific environmental issue. This Final Group Project Report is authored by MESM students and has been reviewed and approved by:

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ADVISOR

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ADVISOR

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DEAN

DATE \_\_\_\_\_

## Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)

### Group Members

Elizabeth Ayres, Eli Knapp, Suzanne Lieberman, Julie Love, Kirk Vodopals

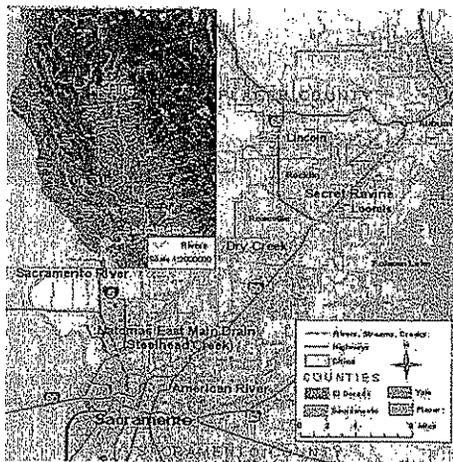
### Faculty Advisors

Bruce Kendall, Ph.D. and Carol McAusland, Ph.D.

In this study we investigate the impact of anthropogenic stressors on the fall-run chinook salmon (*Oncorhynchus tshawytscha*) in Secret Ravine, Placer County, CA through an Ecological Risk Assessment (ERA). The Central Valley fall-run species has experienced exponential decline in the last half-century, and community stakeholders are interested in understanding the causes of this decline. As a guide, we use the Relative Risk Model as a guide, a specialized form of ecological risk assessment, which was developed by Dr. Wayne Landis of Western Washington University. Our study combines quantitative source analysis of land use through geographic information systems (GIS), with dose-response estimates of biological, chemical and physical stressors to the salmon. Because the Relative Risk Model was designed to rank and prioritize ecosystem effects on a regional scale, we have also created a model which may be better equipped to evaluate stressors at the watershed scale (the "Stressor-Driven Risk Model"). Both models enable use of qualitative input in the absence of complete data, allowing managers to take action based on prioritization of known risk.

We analyzed and quantified the risk associated with twelve sources and ten stressors. We used the top three stressors associated with the most highly contributing sources from the results in the Modified Relative Risk Model to compare effects directly associated with the top stressors in the Stressor-Driven Risk Model. Sediment was identified as a top stressor in both models. We synthesized the results of both models to be able to more comprehensively characterize the stream system and its impacts on the fish in order to make management recommendations to stakeholders. The risks facing the fall-run chinook salmon reflect many of the risks that threaten the overall stream health of the larger Secret Ravine watershed and the Sacramento River drainage system. Therefore, the results of the ERA should serve as an important first step to management of fall-run chinook, as well as management of similar creeks under threat of encroachment by suburbanization.

## Executive Summary



LOCATION OF SECRET RAVINE WITHIN THE SACRAMENTO RIVER WATERSHED

### Introduction

Secret Ravine is a 10.5 mile-long creek located east of Interstate-80 in Placer County. The stream is part of the upper Central Valley watershed, and is a tributary of Dry Creek, which drains into the Sacramento River.

Secret Ravine supports a population of fall-run chinook salmon, but has experienced an estimated ten-fold decline in the last forty years, a rate even higher than the similar declining trend of chinook salmon in the Central Valley over this same time period (Gerstung 1965). "The chinook salmon is the preeminent anadromous<sup>1</sup> fish in California,

whether measured by economic value, popular recognition or ecological importance" (Yoshiyama et al. 1998). The Central Valley fall-run species has maintained populations high enough to prevent them from being listed as Endangered under the Federal Threatened and Endangered Species List in California. However, their designation as a Candidate Species for "Threatened" status, without actual federal protection, makes assessment and mitigation of their decline even more urgent. Proliferation of salmon in smaller tributaries such as Secret Ravine is also thought to contribute highly to preservation of genetic diversity in larger rivers such as the American and Sacramento (DCC 2001).

Causes for this decline can generally be attributed to urban encroachment, pollution and other forms of land use alteration. Secret Ravine stakeholders were interested in targeting the causes of decline within the Secret Ravine watershed because it is considered to have the best spawning habitat in the immediate area (G. Bates, pers.



A STRETCH OF SECRET RAVINE

<sup>1</sup> anad-ro-mous: ascending rivers from the sea for breeding. <http://www.webster.com/cgi-bin/dictionary>.

comm. via J. Love 2002).

Under the guidance of CalEPA, group members were charged with developing an ecological risk assessment (ERA) to compare the various threats of anthropogenic stressors on fall-run chinook salmon. Based on the results, we prioritized sources and stressors for local organizations so restorative and preventative measures could be taken to protect the salmon population.

#### **Significance and Scope**

The scope of our study concentrates on stressors located in Secret Ravine proper. Our analysis eschews stressors related to adverse affects in the ocean, in the delta and in the larger tributaries, even though fall-run chinook spend a significant portion of their life cycle in these areas. However, as parts of each life stage occur in Secret Ravine, we had cause to focus our efforts in the creek.

Roseville, the city into which Secret Ravine drains, is also the fastest growing in Northern California. The cities surrounding the watershed have undergone complex transformation: from placer and hydraulic mining, to orchard use, to suburban and residential development.

The Secret Ravine watershed contains a canal system still in place from the Mining Era, which contributes to an altered flow regime. The creek is characterized by patchy substrate of high quality gravel overlain by excess fine sediment, or sand, and fairly adequate temperatures for all life stages of fall-run chinook. The creek also contains high-quality macroinvertebrate food supply for juveniles, fair - but highly invaded - riparian cover, and a relatively high density of beaver dams. Dry Creek (downstream of Secret Ravine) had been assessed 100% toxicity levels in previous habitat surveys, so there was also cause for concern for high toxicity levels in Secret Ravine (G. Bates, pers. comm. via Fish Group 2002).

An ecological risk assessment "is a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors" (U.S. EPA 1998). Within the ERA framework, we used available data and information to help understand and predict the links between sources, stressors and their resulting ecological effects.

There are three phases of an ERA: 1) problem formulation; 2) risk analysis; and 3) risk characterization (U.S. EPA 1998).

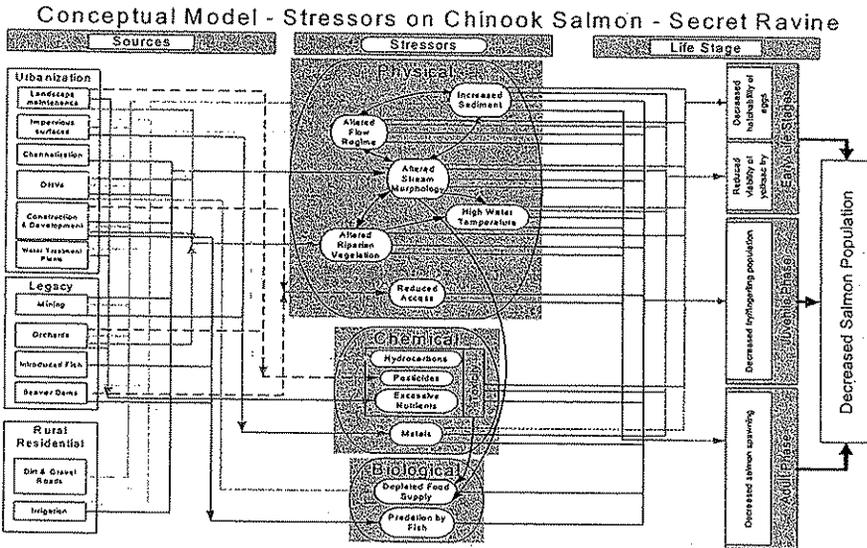
#### **Problem Formulation**

Problem formulation, the first phase of an ERA, includes a clear definition of the problem, and a plan for analyzing and characterizing risks. In consultation with our stakeholders we chose reproductive success of the fall-run chinook to be our assessment endpoint. Our endpoint, based on the viability of each life stage, depends upon completion of the life-cycle (e.g. the ability of an adult to reach spawning grounds and

*Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)*

reproduce; the ability of the eggs to hatch; or the ability of the alevin to emerge from the redds).

The conceptual model we designed delineates the pathways that connect all possible sources (twelve on our system) to all possible stressors (ten on our system) to the three major life stages of the salmon that occur in Secret Ravine.



**Risk Analysis**

Risk analysis evaluates the ecological impact that will occur from exposure to a stressor and determines the method for evaluating risk posed to the endpoint of the ERA.

Two models were used to characterize risk in Secret Ravine: the Modified Relative Risk Model (MRRM) and the Stressor-Driven Risk Model (SDRM). The Relative Risk Model (RRM) is a specialized form of ecological risk assessment developed by Dr. Wayne Landis of Western Washington University. Initially, this model gave us a systematic way to quantify ecological risk posed by sources and stressors in Secret Ravine. Using the Relative Risk Model (Landis 1997) as a template, we developed a Modified Relative Risk Model specific to Secret Ravine.

The Modified Relative Risk Model (MRRM) combines quantitative source analysis of land use through Geographic Information Systems (GIS) and reference values to estimate biological, chemical and physical stressors to the salmon. Based on these estimates, data for the region are converted into a ranking system. A risk score, or the quantification of risk, is calculated for sub-watersheds (or "risk regions"), sources, stressors, and habitats.

In order to address the limitations of the traditional RRM and the MRRM, we developed the Stressor-Driven Risk Model. The crux of the Stressor-Driven Risk Model lies with the use of percent effect (percent habitat reduction or percent reduction in population) specific to the three life stages of salmon. These percentages are calculated using dose-response curves, reference values or habitat loss estimations. Risk for sources and stressors is expressed as 'percent effect,' rather than as ranks. This eliminates problems associated with multiplying ranks throughout the model, and gives the SDRM greater precision in the biological components.

The MRRM uses analysis of sources, stressors, habitats<sup>2</sup> and exposure filters<sup>3</sup> to qualify risk. The SDRM uses predominantly stressor effects to determine risk. Both use a combination of data from the creek and literature to estimate these relationships.

At its best, the data included one to three years of sampling sites collected on Secret Ravine throughout the extent of the watershed (sediment, morphology, toxicity, metals and food supply) and strong support of these data in the literature and from local experts. At worst (as in the case of flow), there was very little actual associated data, the stressor analysis only had enough extrapolated data to focus on one criterion associated with that stressor (e.g. scour), and there was high natural variability associated with the stressor itself. All data suffered from limited sampling sites over limited years.

#### **Risk Characterization**

Risk characterization describes the actual assignment of values to each of the risk factors and includes a summary of assumptions, scientific uncertainties, strengths and limitations of the analysis (U.S. EPA 1998). The Modified Relative Risk Model uses ranks to characterize effects in each risk region, while the Stressor-Driven Risk Model integrates the "percent effects" of each of the stressors across the entire watershed.

The following equation incorporates ranks with habitat, exposure and effect was used to calculate a risk score for the MRRM.

$$\text{Risk Score} = \frac{(\text{Source Rank}) \times (\text{Habitat Rank}) \times (\text{Effects Rank})}{(\text{Exposure 1 filter}) \times (\text{Exposure 2 filter})}$$

The SDRM quantifies stress in terms of effect on fish populations. To better discern the impact of stressors, the effect was translated into percent mortality or percent reduction in habitat for each life stage. Once the percent effect of an individual stressor is determined, the percent effect for each life stage was multiplied together. In essence, the product simulates the percent survival of fall-run chinook salmon through the three life stages in Secret Ravine. The percent effect result is subtracted from one and multiplied through the three life stages. This value is subtracted again from one, rendering a total percent effect.

<sup>2</sup> "Habitat" is used as another parameter to capture the affected life stages of salmon (as opposed to conventional ecosystem-type habitats used in a regional risk assessment). Habitat in our study refers to the water column, the benthos, or both.

<sup>3</sup> The first exposure filter (Exposure 1) assesses whether or not the source emits the stressor. The second exposure filter (Exposure 2) assesses whether or not the habitat will be exposed to the stressor.

$$\text{Total Percent Effect}_{(\text{per stressor})} = 1 - [(1 - PE_{\text{egg}}) \times (1 - PE_{\text{juvenile}}) \times (1 - PE_{\text{adult}})]$$

In the uncertainty phase of risk characterization for the MRRM, we measured the sensitivity of the assignment of the ranks to the total risk scores. With the SDRM, we estimated the uncertainty of our results based on the natural variability of the system.

**Results and Recommendations**

Sediment, flow and morphology ranked as the top three stressors in the MRRM, while sediment, reduced access and toxicity ranked as the top three stressors in the SDRM.

**Top Three Stressors**

Modified Relative Risk Model	Stressor-Driven Risk Model
Sediment	Sediment
Flow	Reduced Access
Morphology	Toxicity

Despite large differences in the risk characterization phases of these models, sediment ranked highly in both models. This in part demonstrates the impact of the conceptual model in elucidating ecosystem pathways on Secret Ravine. Because sediment ranked highly in both models, we have confidence that this stressor may be particularly problematic for Secret Ravine. Although flow and morphology did not register as the highest stressors in the SDRM, these stressors are associated with the "sediment-flow-morphology" cycle on the conceptual model and should be addressed in any management plan. Reduced access and toxicity stand out as two glaring omissions from the MRRM. Reduced access, the lowest-ranking stressor in the MRRM, had few sources, while toxicity, with the third lowest risk score, had only one habitat (the benthos) associated with it. However, reduced access is the only stressor that deals directly with the potential consequences of delay in adult spawning and in juvenile emigration. Thus, it is reasonable to conclude that reduced access would pose a high risk to salmon and may be a high-ranking stressor. Toxicity can cause high mortality during the early life stages of fall-run chinook, especially in regards to heavy metals that may be associated with mine tailings. Thus it was reasonable to expect that this stressor would pose some of the worst risk to the fish.

Consequently, sources associated with stressors registering the highest percent effects - that also had the highest magnitudes - were discussed. Sediment had eleven total contributing sources. Impervious surfaces and off-highway vehicles were the leading sources causing increased sediment in Secret Ravine. Both non-structural and structural management practices should be implemented to prevent sediment loading. Of the five sources contributing to toxicity, impervious surfaces, landscape maintenance and waste treatment plants are the highest potential contributors. In areas where impervious

*Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)*

surfaces are extensive, we recommend that localized bio-filtration devices be installed to minimize the effects of peak flow runoff. While the benefits of beaver dams seem to be outweighed by the physiological costs to the fish of reduced access itself, the monitoring and breaching of particularly problematic beaver dams needs to be considered in more detail.

This study gave us the opportunity to test the suitability of performing an ecological risk assessment for chinook salmon. While the MRRM may be best used for determining the most important stressors (risk) to a system in a preliminary fashion (and as a data-needs assessment tool) the Stressor-Driven Risk Model demonstrates that ecological risk assessments can also convey biologically meaningful results in absence of a complete data set. Indeed, the SDRM had the ability to estimate that stress internal to Secret Ravine was responsible for half of the mortality associated with the entire life cycle of the fish migrating through this watershed. Thus, we strongly feel that ecological risk assessments that are biologically-sensitive to the needs of the species are an important first step in resolving problems associated with declining salmon populations. Although both models suffer from an inability to accurately account for the contributions particular sources make to stressors on the system, we are confident in the magnitudes we assigned to sources in the SDRM. We could thus use these magnitudes to estimate the impact that mitigating them would have on improving salmon health. The models highlight sources of concern. Any future analysis of source contributions necessitates a separate study in itself.

## Acknowledgements

The UCSB Fish Group would first like to thank Barbara Washburn from CalEPA for developing this project and providing us the opportunity to work on such an important issue. We are thankful for her guidance and expertise over the summer and throughout the entire project. We would also like to thank Jim Donald from CalEPA for his helpful recommendations and insights.

Special thanks and appreciation goes to our advisors Bruce Kendall and Carol McAusland for their constant encouragement, contributions and invaluable expertise.

We would also like to thank Gregg Bates and Dave Baker from the Dry Creek Conservancy for sharing their knowledge of Secret Ravine. Thanks to Hal Freeman and Sarah Egan from ECORP Consulting, Inc. for performing the Secret Ravine Habitat Study, and for doing it around our schedule. We would also like to thank Rob Titus from California Department of Fish and Game for sharing his knowledge of salmon, his time, and his equipment. And to Tim Horner and Steve Rounds from California State University, Sacramento for the use of their petrology lab and their time.

There were also many other people we would like to thank who made this project possible because of their contributions: the Dry Creek Watershed Council, Jamie Ballard from Placer County Water Agency, Jim Carlise from CalEPA, Christopher Costello from the University of California, Santa Barbara, Loren Clark from Placer County, Linda Deanovic from University of California at Davis, Emily Hart Hayes from University of Western Washington, Audra Heinzl from CalEPA, Gary Hobgood from California Department of Fish and Game, Melissa Hugenberger from Placer County, Bruce Joab from CalEPA, Brian Keating from Placer County, Kate Kirsch from Foothill Associates, Chris Lee from Department of Water Resources, David Leland from California Regional Water Quality Control Board, Stacy Li from National Marine Fisheries Service, Glenda Marsh from Department of Water Resources, Christopher Marwood from the University of California, Santa Barbara Rob Nelson from City of Roseville, Mike Posehn from Dry Creek Conservancy, David Siegel from CalEPA, Brent Smith from Placer County Water Agency, Matt St. John from California Regional Water Quality Control Board, Kris Vyverberg from California Department of Fish and Game, Brad Valentine from California Department of Fish and Game, Lori Webber from California Regional Water Quality Control Board, and especially Shirley Williams from CalEPA, and the guys at the burrito cart.

Finally, we were extremely grateful to have had each other as team members, in terms of both the dedication we felt for this subject, and the sense of humor we shared along the way.

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## List of Acronyms and Abbreviations

BOR - Bureau of Reclamation  
BPJ - Best professional judgment  
CEP - Coastal Ecotoxicology Program  
CEQA - California Environmental Quality Act  
DCWC - Dry Creek Watershed Council  
DDT - Dichlorodiphenyltrichloroethane  
DFG - Department of Fish and Game  
DHS - Department of Health Services  
DPR - Department of Parks and Recreation  
DWR - Department of Water Resources  
DQO - Data Quality Objectives  
DTSC - Department of Toxic Substance Control  
DWR - Department of Water Resources  
ECORP Consulting - not an acronym, a consulting firm  
EHIB - Environmental Health Investigations Branch  
EIR - Environmental Impact Report  
ERA - Ecological Risk Assessment  
ESA - Endangered Species Act  
GIS - Geographic Information Systems  
HCP - Habitat Conservation Plan  
MRRM - Modified Relative Risk Model  
NOAA - National Oceanic and Atmospheric Administration  
NOAEL - No Observed Adverse Effect Level  
NMFS - National Marine Fisheries Services  
NRCS - Natural Resources Conservation Service  
NTU - Nephelometric Turbidity Units  
OEHHA - Office of Environmental Health Hazard Assessment  
OHVs - Off-highway vehicles  
PE - Percent effect  
PBL - Percent pools by length  
PCCDD - Placer County Community Development Department  
PCFC - Placer County Flood Control  
PCWA - Placer County Water Association  
PG&E - Pacific Gas and Electric  
RCHAS - Reproductive and Cancer Hazard Assessment Section  
RWQCB - Regional Water Quality Control Board  
SACOG - Sacramento Area Council of Governments  
SDRM - Stressor-Driven Risk Model  
SRAMP - Secret Ravine Adaptive Management Plan  
SWRCB - State Water Resource Control Board  
TIEs - Toxicity Identification Evaluations  
TPE - Total Percent Effect  
UCSB - University of California, Santa Barbara

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USDA – United States Department of Agriculture  
U.S. EPA - United States Environmental Protection Agency  
USFWS - United States Fish and Wildlife Service  
WQCB - Water Quality Control Board

## 1 Introduction

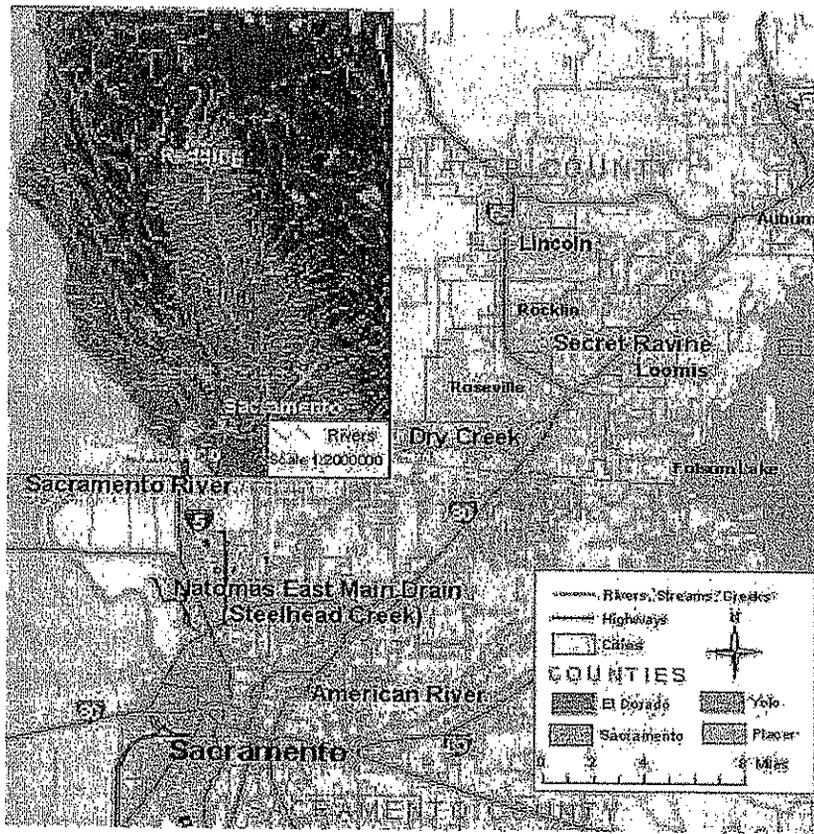
### 1.1 Significance of the Project

"The chinook salmon is the preeminent anadromous<sup>4</sup> fish in California, whether measured by economic value, popular recognition or ecological importance" (Skinner 1962, McEvoy 1986, Yoshiyama et al. 1998 as quoted by Yoshiyama et al. 1998). The Central Valley river system, encompassing the Sacramento River drainage in the northern half of California and the San Joaquin River drainage in the south, comprise the only system in the world which supports four separate races (runs) of chinook which use the system for spawning year round (Yoshiyama et al. 1998). The Central Valley fall-run species have maintained populations high enough to prevent them from being listed as Endangered under the Federal Threatened and Endangered Species List in California. However, their designation as a Candidate Species for "Threatened" status, without actual federal protection, makes assessment and mitigation of their decline even more urgent. Their numbers have dropped from the hundreds of thousands at the turn of the 19th century, to several thousand in the 1960s, to several hundred within the Dry Creek watershed. Secret Ravine drains into the Dry Creek watershed, which is itself a tributary of the Sacramento River. Proliferation of salmon in these smaller tributaries is thought to contribute to preservation of genetic diversity in the larger rivers such as the American and Sacramento (DCC 2001). Moreover, as a top predator in Secret Ravine, the risks facing the fall-run chinook salmon indicate many of the risks that threaten the stream health in the larger watershed system of Secret Ravine. The group will synthesize the results of the two ecological risk assessment models to provide a focal point for options that will assist community leaders, the public, state and federal agencies in making better-informed decisions about the management of the Secret Ravine watershed.

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<sup>4</sup> *anadromous*: ascending rivers from the sea for breeding. Etymology: Greek *anadromos* running upward, from *anadromain* to run upward, from *ana-* + *dromain* to run -- (Webster Dictionary definition).<http://www.webster.com/cgi-bin/dictionary>.

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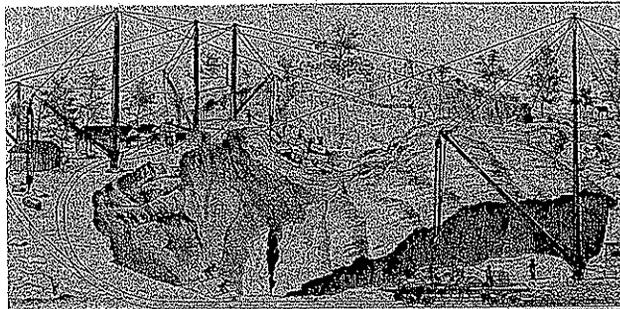
LOCATION OF SECRET RAVINE WITHIN THE SACRAMENTO RIVER WATERSHED

## 2 Background

### 2.1 Historic Uses of the Watershed

Secret Ravine drains into Dry Creek, which is a small tributary of the Sacramento River via the Natomas Main Drain (also known as Steelhead Creek, see above), and lies in western Placer County between the city of Roseville and the Newcastle area (Department of Water Resources 2002). Secret Ravine is a relatively small water body (37-square miles in area) that is linked through a series of drainage systems to the San Francisco Bay and Pacific Ocean. Humans have inhabited the watershed as far back as 1500 A.D. when the Nisenan people of the hunter-gatherer Maidu tribe depended on the natural resources within the watershed for sustenance (DCC 2001). By the early 1800s Europeans had reached the Nisenan territory - which extended to the crest of the Sierra Nevada mountains in summer months - and half a century later much of the land surrounding Sacramento was privatized into large land grants (PCCDD 1989).

Large-scale mining provoked the first major debate over the use of water for Californians in counties such as Placer, formed three years after the discovery of gold just east of Dry Creek, and named after the Spanish word for 'sand or gravel deposits containing gold' (Haley 1923).



HISTORIC RENDERING OF A DREDGE MINE IN PENRYN, PLACER COUNTY (1886)

(Appendix A: Mining in the Secret Ravine Watershed contains a more detailed account of mining history within the Secret Ravine watershed). Water used primarily for hydraulic mining to permit access to gold-bearing gravels, went unregulated until the passage of the 1887 Wright Act<sup>5</sup> (Rogers and Nichols 1967). In addition, the Caminetti Act was passed in 1893 to limit the impacts of hydraulic mining, (estimated to have been 46,025,391 cubic yards per year on the Yuba in the late 1800s) "to permit hydraulic

<sup>5</sup> The Wright Act granted rights to non-riparian owners for the first time, (landowners whose holdings did not border natural stream channels) by permitting the creation of public irrigation districts (Rogers and Nichols 1967).

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mining to be carried on, provided the same can be accomplished without injury to the navigability of said rivers or injury to the lands adjacent thereto" (Haley 1923). These two acts, in combination with the increasing value of land for agriculture, led to the great proliferation of large-scale irrigation systems in the state, and to the onset of commercial farming in the region.

Secret Ravine has a unique canal history coincident with these events. An intricate series of canals were constructed during the peak of the placer gold mining (circa 1870), which were used to deliver water from the Pacific Gas and Electric hydroelectric dam operation on the Yuba/Bear rivers (B. Smith and J. Ballard, pers. comm. 2002). The bulk of the water was meant for municipal use in southwestern Placer County. Placer County Water Association employees estimated that nearly 100% of the water in Secret Ravine was derived from the canal system during dry summers, with some of the canals running into natural waterways.

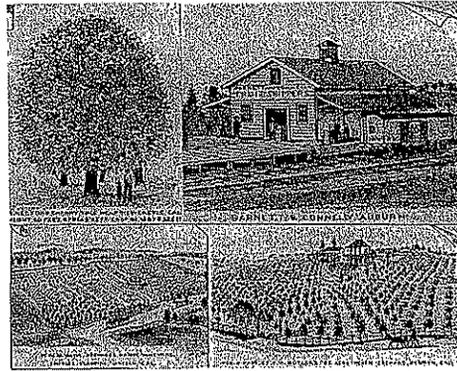


JAMIE BALLARD (PCWA) AT BOARDMAN CANAL GATE

In addition, 30% of the water was lost from the system through evaporation, leaks, straws and unlined canals. These events - which carry through to the present (water is still sold in miner's inches) - reinforced the idea that landowners and irrigation cooperatives can aggressively use "prescriptive rights" to convey water to their property via the canal.<sup>6</sup> They have also currently made the flow rates necessary to derive adequate stage depth for the salmon and other creek life nearly impossible to determine, not to mention flow rates for municipal use. The pre-World War II era in the Secret Ravine region was characterized by commercial agriculture, dredge mining and cattle herding.

Orchards became the most successful crops and furnished a market for populations throughout the Sierra foothills via the Central Pacific Railroad, which helped inflate the population of Roseville from 250 in 1906 to 6000 in 1924. Dredge mining peaked in areas of present-day Rocklin and Penryn during the war years, producing the second largest output since the Mining Era.

<sup>6</sup> Defined in multiple ways, Rogers & Nichols variably describe the legal definition of prescriptive rights as "loss of private easement to water or water facilities by nonuser or adverse possession, 25 ALR2d 1265, 1308, 1333," "the easement by prescription in artificial drains, pipes or sewers, 55 ALR2d 1144," or simply, "the parasites of water rights" (Rogers & Nichols, p. 325). Prescriptive rights succeed riparian and appropriative rights in the evolution of water rights in California. They were very controversial at the time (and still are), as appropriative rights are based on a grant from the state or federal government and prescriptive rights based on 'adverse use.' Prescriptive water rights are obtained when 'open possession of non-public water is taken for a reasonable beneficial use [where] the taking must be adverse and hostile to the owner's claim and made under a claim of exclusive title and right' (Rogers & Nichols, p. 339). Nevertheless, a major portion of the irrigation rights on lands in California originated in prescription.



HISTORIC RENDERING OF ORCHARDS IN NEWCASTLE, AUBURN, LINCOLN AND PENRYN (1886)

Increasingly intensive farming methods, together with the urbanization of the floodplain following the war, led to large flooding events in the 1960s throughout the watershed.

## 2.2 Geology

The Secret Ravine drainage basin "is underlain by granitic rocks of Mesozoic age and is capped unconformably by volcanic and volcanoclastic rocks of the Miocene Mehrten Formation (primarily occurring in the lower watershed) and by Pleistocene alluvial fans and fluvial deposits of the Tulock Lake and Riverbank Formations" (Jones and Stokes 1994). Extensive Placer mining in the 19<sup>th</sup> century has resulted in an abundance of highly permeable decomposed granite. These sediments (including the Mehrten Formation) tend to be coarser and better suited for salmon and steelhead habitat, "although there is still excess fine material" (T. Horner, pers. comm. 2003).

The entire watershed is undergoing accelerated bank erosion and channel enlargement due most likely to increased flows from urbanization and various adjacent land uses (Jones and Stokes 1994). Landsliding does not seem to be an issue within the watershed due to the lack of steep slopes.

## 2.3 Biology

The chinook salmon (*Oncorhynchus tshawytscha*) is part of the family Salmonidae, which includes salmon, trout, and whitefish. It is the largest Pacific salmon, usually weighing over 30 pounds and growing to 58 inches. Chinook are the most abundant species of salmon in California, but the least numerous of Pacific Coast salmon (McGinnis 1984).

Salmon are anadromous: they migrate from the sea to fresh water to spawn. Chinook salmon are widely distributed in the north Pacific Ocean during the ocean phase of their

*Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)*

life. Ocean temperatures set their southern limits. During their freshwater phase, chinook salmon are found in North American streams as far north as Kotzebue Sound, Alaska and as far south as the San Joaquin and Kings River in Central California (McGinnis 1984).

Chinook salmon show a diversity of life histories with two basic types: stream-type and ocean-type. The chinook that spawn in Secret Ravine are ocean-type salmon; they spawn soon after entering freshwater and juveniles spend a relatively short time rearing in freshwater (Moyle 2002).

The spawning period of a chinook salmon determines which run they belong to: fall-run, late-fall-run, winter-run, or spring-run (Moyle 2002). The salmon we focus on in this study are fall-run chinook. Their spawning period is from late September to December, with a peak in October and November (Moyle 2002 and DCC 2001).

Female chinook build spawning areas, known as redds. Typically, redds are built at the tail-out of pools, but given the small size of Secret Ravine, most redds are built at the tail-outs of runs (G. Bates, pers. comm. 2002 and R. Titus, pers. comm. 2002). Chinook

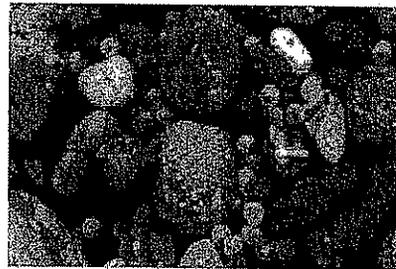


FEMALE CLEANING THE REDDS

Station 1988). After spawning, adult salmon die due to an irreversible enzymatic change (Page and Brooks 1991).

Eggs of the fall-run chinook salmon hatch after 40 to 60 days of incubation. The alevins (yolk-sac fry) remain in the stream bottom for four to six weeks, living off the nutrient rich yolk attached to their body (DCC 2001). Once the yolk-sac is absorbed the fry emerge from the gravel and begin migrating toward the estuaries, where they begin the transition necessary to live in the ocean.

require clean and loose gravel that will allow for proper oxygen exchange and remain stable throughout incubation (DCC 2001). The female uses her tail to clear away fine sediment and gravel, creating an oval area where several pockets of eggs are deposited. After fertilization the eggs are buried 20 to 60 cm below the gravel surface. The size of a redd is directly proportional to the size of the fish. (Fish and Wildlife Service and Coastal Ecology Group Waterways Experiment



SALMON EGGS NESTED IN SPAWNING GRAVELS

During the transition from a freshwater to a saltwater existence, the juveniles are known as smolts. Smolts migrate to the ocean from the estuary when freshwater increases river flow and turbidity, and decreases temperature (Moyle 2002). Smolts grow to adults in

*Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)*

the ocean, where they remain until they are mature enough to spawn. Thus the cycle repeats itself.

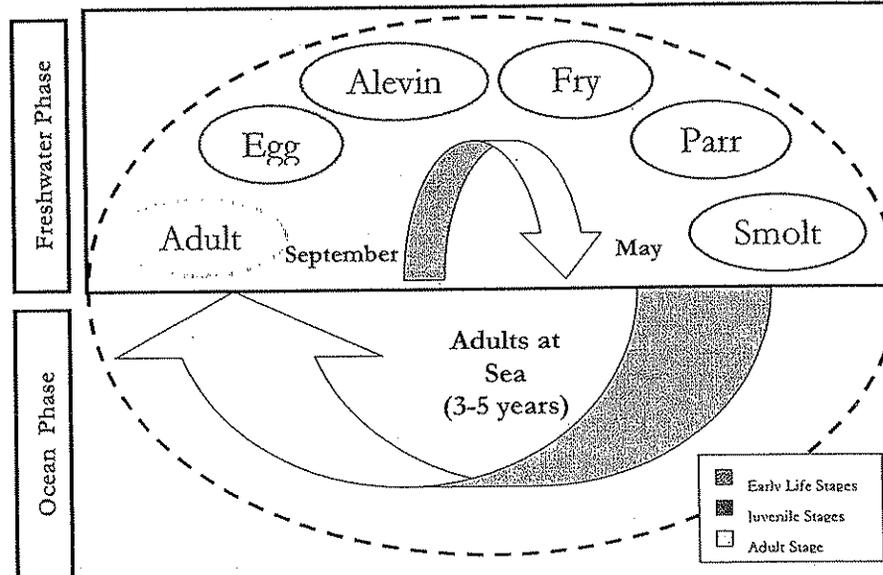


FIGURE 2.1 LIFE CYCLE ON SECRET RAVINE

Life Stage	Presence in Secret Ravine
Eggs and Alevins	November, December, January, February
Juveniles	Late January, February, March, April, May
Adults	September, October, November, December

TABLE 2.1 LIFE STAGES IN SECRET RAVINE

Chinook at various life stages utilize Secret Ravine at different times (Table 2.1). Eggs and alevins reside in the benthos from November through February. When they emerge from the gravel as fry, the juveniles use Secret Ravine as feeding grounds from late January through May. Chinook return to spawn as early as September, to as late as December. For each stressor, these months were considered when analyzing risk, unless otherwise noted.

## 2.4 Population, Distribution and Migration

Although historical abundances of Central Valley chinook before the onset of large-scale fishing operations are uncertain, early commercial catch records set the maximal production at around one to two million spawners per year (Yoshiyama et al. 1998). Differences in life history timing, spatial distribution and habitat requirements have not only enabled the four runs to most efficiently maximize the resources of the drainage system, they help account for markedly different population histories (Yoshiyama et al. 1998). All four races were heavily overfished as soon as seine-river fishing (1850s), and later commercial ocean fishing (early 1900s) replaced Native American catches, so that 5-10 million pounds of fish per year were being caught during this period. It was recognized as early as the 1870s that the salmon runs had begun to decline, due to such causes as hydraulic mining, dredge mining and loss of habitat due to construction of dams (CFC 1871:44 as quoted by Yoshiyama et al. 1998). Nevertheless, in addition to having to navigate lower relative topographical reaches (fall-run can migrate as far upstream as 1000 feet in elevation) and having their runs timed with fairly reliable storm events, the fall-run most likely sustained much less harvest pressure in the early years relative to the other runs due to their entry into rivers under a more highly deteriorated state. The elevation threshold also prevented the fall-run from being as highly affected by major water projects (Yoshiyama et al. 1998). As soon as the spring and winter runs were depleted, however, the fall-run became disproportionately exploited in the early 1900s, so that by the 1960s, the Sacramento drainage contained an average of only 176,000 spawners.

Although CDFG and USFWS initiated spawning escapement surveys in the late 1930s, little attempt has been made in the literature to standardize the data in order to produce rigorous statistical analyses of the population dynamics of the Central Valley runs. Correction factors would need to be applied to adjust for differences in sampling effort and accuracy, counting methods, and inconsistent time series among streams (Yoshiyama et al. 2000). The uncertainty associated with population estimates is exacerbated by the dearth of research that has been done on the impacts to salmon in the ocean, which include harvest, predation and climatic variability. Eric Gerstung reported in the 1964 Fish & Game survey, however, that for every one fish that was produced in Secret Ravine, another three could have been expected to be taken by commercial fishing (CDFG 1965).

Nevertheless, abundance estimates, when viewed as approximations with wide confidence intervals, can be useful to show major trends in terms of magnitude over recent decades (Yoshiyama 2000). They can also be used to describe "the spatial and temporal periodicity of chinook spawning" in Secret Ravine (R. Titus, pers. comm. 2002), which would allow us to roughly estimate, correlations with preferred spawning habitat, which has particularly important implications for management recommendations. We also used CDFG data to estimate the population size of the

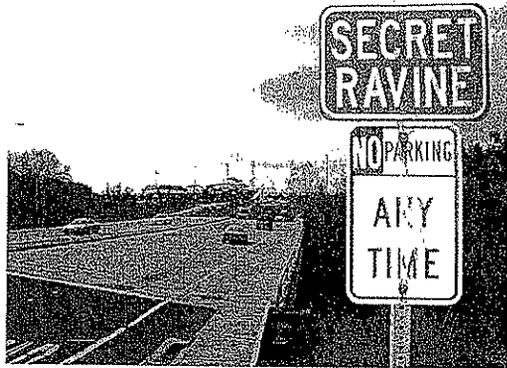
*Assessment of Stressors on Fall-Run Chinook Salmon in Secret Ravine (Placer County, CA)*

Secret Ravine fish through their full life cycle by looking at several points outside of the system: fry estimates at the outlet of the San Francisco Bay Delta, and adult estimates at the base of the Sacramento main stem. We used this data to estimate whether the numbers were declining disproportionately outside of Secret Ravine, or whether, once reaching Secret Ravine, chinook encounter such poor habitat that they produce disproportionately few offspring within the creek proper.

From 1997 to 2002, the adult spawning counts have averaged 160 annually for Secret Ravine, and the outmigrating juvenile accounts have averaged 15,000 per year for roughly the same time period (1998-2002). We chose to focus on Secret Ravine because Secret Ravine is considered to have the best spawning habitat in the local area (G. Bates, pers. comm. via J. Love 2002). Indeed, Department of Fish and Game counts from 1964 indicate that 900 live fish and carcasses were estimated in Secret Ravine, comprising 90% of the estimate in the Dry Creek drainage system. This is a considerable number, given the small areal extent of Secret Ravine relative to habitat that such large fish would normally seek out (R. Titus, pers. comm. 2003). And although Secret Ravine may be an atypical fall-run stream in many ways, apart from the chronic problem of excess sand (Li, Swanson, Nelson, Meyers, Titus, Dvorsky via DCC 2001) and decomposed granite (E. Gerstung via R. Titus, pers. comm. 2003) the creek is noted for its consistently good quality gravel, abundance of deep pools and adequate riparian cover. Temperature and flow typically coincide in optimal amounts when the fall-run migrate upstream (R. Titus, pers. comm. 2003). Nevertheless, the small size of the watershed, together with its overall low gradient make salmon in this system even more dependent on proximate conditions such as appropriate habitat and ambient weather conditions.

Chinook salmon are thought to use magnetic fields and other general clues to draw them from the deep ocean to the coast, and olfactory sensing, to bring them back to their natal streams (R. Warner, pers. comm. 2003). The evolutionary need for these fish to migrate has been explained as a response to prehistoric glacial movement, and today is understood as driven by the change in resource availability between freshwater and ocean environments (Alcock 2001). Freshwater is more appropriate for the salmon in terms of breeding grounds because of ostensibly fewer predators and increased likelihood of finding mates of a common population (R. Warner, UCSB Lecture 2003). Nevertheless, once salmon have migrated as far as their natural physiological limits and olfactory senses will take them (indeed, they are thought to be able to recognize their own kin, if not the precise redd from which they emerged), they would seem to be limited primarily by habitat and metabolism. Thus, homing cues can guide them back to their natal streams, but choice of spawning location would seem to be habitat limited, and thus, on such a small system as Secret Ravine, highly dependent upon the timing of individuals within the fall-run. Straying is increasingly common, however (R. Warner, pers. comm. 2003), and with 30% of hatchery-produced fish annually being conveyed to the Sacramento main stem (Yoshiyama et al. 1998), the ability of the four extant runs of salmon to try to retain their genetic integrity on the basis of their homing skills alone is yet a further over-arching stress to fall-run populations.

## 2.5 Current Uses of the Watershed



EAST ROSEVILLE PARKWAY. NEAR THE CONFLUENCE

In 2002, the last of the fruit-packing businesses in Roseville closed (G. Bates, pers. comm. 2002). Currently no large-scale cattle operations remain in the Secret Ravine drainage (Placer County 1994) and the agriculture that once dominated the watershed has been replaced with new suburban development. Today the western portion of Placer County, containing Secret Ravine, has a population of 237,145 people, that over the next 25 years is projected to increase by

75% to 415,335 (SACOG 2002).

In 1963, the California Department of Transportation, CalTrans, began construction on a northern interstate from the San Francisco Bay area through Sacramento to Reno (California Highways 2002). The completion of Interstate 80 (I-80) in 1972 brought a record number of vehicles through the Secret Ravine watershed and influenced its future land use. CalTrans estimates 146,000 vehicles a day travel past Secret Ravine on I-80 (CalTrans 2001). These trips include through-traffic heading east over Donner Pass, local traffic traveling to Roseville and the Rocklin area, and commuters traveling to the Sacramento metropolitan area. Travelers on I-80, given the opportunity provided by daily congestion of highway traffic, can see the Secret Ravine riparian area bordering the highway to the southwest from Newcastle to the Taylor Road exit.

The zoning of much of western Placer County consists predominately of rural residential and single-family designations (Appendix B-1: Secret Ravine Landuse). The influence of this zoning, together with Interstate 80, have contributed to the whole-scale change in land use, creating an area ideal for developing bedroom communities for the businesses in downtown Sacramento. This trend of suburban development has become the main use of the Secret Ravine area and has been projected to continue over the next 25 years (SACOG 2002).

To support this transformation of the cities of Roseville, Rocklin, Loomis and Newcastle from agricultural to suburban land uses, new infrastructure improvements were required. A hospital, a community college, and recreational facilities such as a multiplex movie theater and a park can all now be found in the Secret Ravine drainage (Appendix B-4). Additionally, the Secret Ravine watershed contains sewage treatment ponds for Newcastle and the Castle City trailer park (G. Lockwood, pers. comm. 2002) as well as the Boardman Canal, which transports drinking water via the water treatment plant for

most of western Placer County (B. Smith, pers. comm. and J. Ballard, pers. comm. 2002). The recreational use of the watershed includes activities associated with suburban open space such as hiking, biking, baseball, paint ball and off-roading on off-highway vehicle trails. See **Appendix B: GIS Maps** for current photographs of Secret Ravine.

### 3 Problem Formulation

#### 3.1 Approach

An ecological risk assessment (ERA) “is a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors” (U.S. EPA 1998). Within the ERA framework, available data and information are used to help understand and predict the links between sources, stressors and their resulting ecological effects. Findings can then be used to prioritize environmental decisions (U.S. EPA 1998).

We are using this ERA process, defined by the U.S. EPA, to assess the physical, chemical, and biological stressors on the fall-run chinook salmon in Secret Ravine. Our goal is to prioritize sources and stressors for local organizations so restorative and preventative measures can be taken to protect the salmon population.

There are three phases of an ERA: 1) problem formulation; 2) risk analysis; and 3) risk characterization (U.S. EPA 1998). The first phase, problem formulation, includes a clear definition of the problem, and a plan for analyzing and characterizing risks (**Appendix D: The Framework for Ecological Risk Assessment**). To access the existing information associated with Secret Ravine, we spoke to various local stakeholders and compiled extensive data. In consultation with our stakeholders we chose reproductive success of the fall-run chinook to be our assessment endpoint. Our endpoint is based on the viability of each life stage, and essentially depends upon completion of the life-cycle (e.g. the ability of an adult to reach spawning grounds and reproduce; the ability of the eggs to hatch; or the ability of the alevin to emerge from the redds, etc.). The problem formulation phase also involved the development of the conceptual model (**Appendix E: The Conceptual Model**), which synthesizes our understanding of the relationships of the stressors, sources and effects in the system. The second phase, risk analysis, is driven by the data collected in the problem formulation phase. The data is used to assess how the exposure to stressors is likely to occur and the ecological impact that will occur from the exposure. The risk analysis phase also determines the method for assigning ranks to sources, stressors, habitats and exposure filters. The third phase, risk characterization, estimates risk. It includes a summary of assumptions, scientific uncertainties, strengths and limitations of the analysis that culminates in a description of risk.

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In the following ERA, two models were used to characterize risk in Secret Ravine: the Modified Relative Risk Model (MRRM) and the Stressor-Driven Risk Model (SDRM). By using these two models, we hope to gain slightly different perspectives on risk analysis in order to yield the most comprehensive understanding of the potential risk to the salmon in Secret Ravine.

The Modified Relative Risk Model was designed using the Relative Risk Model (Landis 1997) as a template. The Relative Risk Model (RRM) is a specialized form of ecological risk assessment developed by Dr. Wayne Landis of Western Washington University. Specifically, we looked at a regional ERA performed by Emily Hart Hayes, a graduate student in Landis' lab (Hart Hayes 2002). Initially, this model gave us a systematic way to quantify ecological risk posed by sources and stressors in Secret Ravine.

With our CalEPA clients, Barbara Washburn and Jim Donald, we modified this approach, retaining its basic structure, but changing sections of it in order to accommodate certain unique features of Secret Ravine. Consequently, the Modified Relative Risk Model (MRRM) combines quantitative source analysis of land use through Geographic Information Systems (GIS), with dose-response and effect estimates of biological, chemical and physical stressors to the salmon. Based on the dose-response and effect estimates, data for the region is converted into a ranking system. An equation that incorporates these ranks with habitat, exposure and effect is then used to calculate a risk score. A risk score, or the quantification of risk, can be calculated for sub-watersheds (or "Risk Regions"), sources, stressors, and habitats.

The way in which a rank is established for stressors in the RRM was not suitable for our purposes, hence we modified this in the MRRM. The traditional RRM used a process of natural breaks to assign a spectrum of possible ranks, essentially requiring that every number in the range is assigned, despite whether the absolute level of risk warrants the most extreme ranking. Instead, we used scientific literature to establish baselines associated with risk. This enabled us to incorporate biological meaning into the ranks. We also assigned ranks relative to the data points so that every number in the range does not need to be assigned. Therefore, while we assigned the highest rank to stressor effects directly associated with mortality, there is no way of equalizing the value of a rank for one stressor with that of another (e.g. a '2' for temperature will not necessarily connote the same level of risk as a '2' for morphology).

In order to address the limitations of the traditional RRM and the MRRM we developed the Stressor-Driven Risk Model (SDRM). The crux of the Stressor-Driven Risk Model lies within the use of percent effect (percent habitat reduction or percent reduction in population) specific to the three life stages of salmon. These percentages are calculated using dose-response curves, reference values or habitat loss estimations. Each stressor and source affects life stages differently, so this model will allow us to express these differences, yet not give more importance to any one life stage. Accordingly, the risk scores for sources and stressors will be expressed as 'percent effect' rates, rather than as ranks. This will eliminate problems associated with multiplying ranks throughout the

model, and give the SDRM greater precision. The SDRM will prioritize stressors and sources over the entire creek, instead of assigning ranks per risk region. By comparing the results of the MRRM to those of the SDRM, we hope to achieve the most complete understanding of the processes at work on Secret Ravine.

### 3.2 Conceptual Model

The conceptual model (**Appendix E: The Conceptual Model**) is a "written description and visual representation of predicted responses by ecological entities to stressors to which they are exposed and includes ecosystem processes that influence these responses" (EPA 1998). The conceptual model for this risk assessment contains a listing of sources, primary stressors, secondary stressors and life stages of the fall-run chinook salmon. The model was developed iteratively via numerous discussions that included stakeholders, EPA staff and resource professionals. All interactions were chosen based on their potential plausibility within the Secret Ravine watershed; some interactions that may be typical within other watersheds were excluded based on the discussion in the meetings mentioned above.

The sources are broken down into three categories: urbanization, legacy and rural-residential. The legacy category includes sources that may not be currently present within the watershed (e.g. mining activities), but have long-term effects that may still be contributing stress to the fish.

The primary stressors are broken down into three categories: physical, chemical and biological. These primary stressors may be acting directly or indirectly on the endpoint.

The chinook salmon life stages include three categories: early life stage (which includes the egg and yolk-sac fry stages), juvenile phase and adult phase. All stressors are represented because of their potential impacts on these life stages. Some stressors may act on only one life stage whereas others affect multiple stages.

A complete list of sources and stressors is located in **Appendix F: Sources and Stressors**.

### 3.3 Source Descriptions

#### 3.3.1 Urbanization

With the increase in population in western Placer County, housing developments are increasingly common and infrastructure must expand to accommodate the new influx of residents. The sources in this category reflect consequences of urbanization.

**Landscape maintenance** includes the maintenance of suburban lawns and gardens in new housing developments, as well as golf courses and businesses with sod lawns and

terraces. This source potentially contributes fertilizers, herbicides, metals, and nutrients to the watershed. However, landscaping can also prevent erosion and buffer the effect of impervious surfaces on stream flows.

**Impervious surfaces** describe land uses associated with high pavement densities such as streets and driveways, roofs, and other structures that prevent water from infiltrating into the soil. This has three main effects on the stream. First, impervious surfaces decrease the time between when precipitation falls to when water enters the fluvial system, leading to changes in the flow regime (usually increasing peak flows). Second, the accumulation of fine materials on the surface coupled with increased erosion from increased peak flows can cause an increase in sediment loading to the stream. Thirdly, this source also stores contaminants between rain events. During dry periods hydrocarbons and metals collect on impervious surfaces such as roads and highways, and during rain events these contaminants wash into fluvial systems such as Secret Ravine.

**Channelization** is defined here as any straightening of the creek due to bank stabilization or artificial movement of the channel. One of the main causes of channelization in Secret Ravine was due to the construction of Interstate 80. Sections of the stream banks that were within a certain distance of the highway were reinforced with boulders to prevent the creek from undercutting the highway. In the process, sections of the creek lost some of their sinuosity (U.S. ACE 1997). Channelization also results from the encroachment of development into the riparian area. This process usually involves the removal of native vegetation and the artificial stabilization of the banks. Channelization can result in increased sediments, altered stream morphology and altered flow regimes.

**Construction and development** involves the construction of new houses and infrastructure. This source is unique in that it can result in significant loadings of sediment and alterations to riparian areas. Other stressors resulting from this source include alterations to the flow regime and morphology (increasing imperviousness) along with introductions of in-stream barriers (for water collection, fencing or crossings).

**Water treatment plants** exist in two locations in the headwaters of the watershed. One is near the town of Newcastle and the other as part of the Castle City Trailer park. Both facilities use an aeration basin combined with a solid storage basin (G. Lockwood, pers. comm. 2003). The sewage ponds currently have no direct connection to Secret Ravine, however in the past, the Newcastle facility was forced to chlorinate the effluent coming into the ponds and released water into Secret Ravine due to large rain events that overwhelmed capacity. This source can therefore result in increased sediments, alterations to the flow regime and increased nutrients.

**Off-highway vehicles (OHVs)** include any motorized vehicles (motorcycles, cars, trucks or all-terrain vehicles) that utilize the floodplain of the creek for recreation. These vehicles cause erosion and at times drive within the creek bed itself, potentially destroying invertebrate habitat and sensitive fish-spawning habitat. The most heavily

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used area includes the stretch from East Roseville Parkway to Greenbrae Road in Rocklin (G. Bates, pers. comm. 2003). Impacts associated with this source are: increased sediments, altered stream morphology and riparian vegetation along with a decrease in food supply for the salmon (due to habitat destruction).

### 3.3.2 Legacy

The history of Placer County includes activities that had significant impacts on the Secret Ravine watershed such as placer mining, orchards and introduced fishes. These sources are no longer active but their long-term impacts may still be influencing the habitat of Secret Ravine.

**Mining** includes major mining activity recorded by the California Department of Conservation, Division of Mines and Geology, the Bureau of Mines, U.S. Geological Survey, and Bureau of Land Management, from the time of discovery of gold in 1848 at nearby Coloma, CA, through current aggregate mining claims. This legacy source is suspected to contribute to increased sediments, altered stream morphology, altered riparian vegetation and increased metals.

**Orchards** dominated the Secret Ravine watershed during most of the twentieth century. The production of fruit and other agriculture products during this time period involved the use of persistent pesticides such as DDT (EPA 2002), and altered the vegetation in the riparian zone that affects salmon habitat today. A potential increase in sediments has also been associated with this source.

**Introduced Fish** changed aquatic species assemblages in California substantially over the last century. A wide range of activities may have introduced exotic fish to California waters including sport fishing, mosquito control, and ornamental landscape ponds (Moyle 2002). For example, spotted bass (*Micropterus punctulatus*) planting by California Division of Fish and Game occurred around 1937 to the early 1940's and again in 1973 to 1976 in reservoirs of the Central Valley to provide quality bass sport fishing. This introduction, meant to supplement bass fisheries in reservoirs far from the Dry Creek system, initiated a chain of events that allowed resident populations of spotted bass to establish in foothill streams such as Secret Ravine. Often fish introductions that led to the invasion of Secret Ravine occurred physically distant to our risk assessment area. Due to the extent of invasion and the biology of many of these species, it became necessary to limit the source value to the habitat of most concern. In consequence, fish introduction has been defined to include the riparian buffer zone surrounding Secret Ravine. This source forms the habitat for the current population of introduced fish, which may pose a risk to future generations of chinook salmon. The main impact of this source is increased predation on juvenile and early life stages of the salmon.

**Beaver dams** are thought to result from a combination of introductions made by fur trappers from the East during the onset of the Mining Era, as well as of beavers which are thought to have already existed in the area for many centuries (Morgan 1886).

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Although the source of beaver dams is the beaver populations themselves, the distinction is no longer meaningful due to the fact that beavers have become ubiquitous throughout the regions bordering the Sierra foothills. The Stacy Li habitat study reports that 13.45% of the pools on Secret Ravine are dammed (mostly by beaver dams) (Li 1999). Beavers have long co-existed with salmon, and their presence can have both positive and negative impacts on the fish. Direct impacts of beaver dams include altered flow and reduced access for adult fish. Beaver dams - and some artificial barriers (categorized under 'Construction and Development') - affect sediment by increasing retention in second and third order streams (Naiman 1986).<sup>7</sup> "In several instances a small dam (4-18m<sup>2</sup>) of wood, properly positioned, could retain 2000-6500m<sup>3</sup> of sediment" (Naiman 1986). Conversely, beaver dams can also exert a stabilizing effect on stream ecosystems, causing more sediment to settle out more evenly along the bed (Naiman 1986). Beaver dams - as partial barriers - can indirectly cause superimposition of redds<sup>8</sup> when adult migration is delayed, forcing the fish to spawn in potentially less suitable, or already used habitat. Beaver dams and other barriers, depending on flow conditions, create the opportunity for predators such as bass to congregate just downstream of barriers and prey on emigrating juveniles.

### 3.3.3 Rural Residential

The third category of sources includes land uses that could not be categorized under urbanization or legacy activities. The two rural residential sources that were identified within the Secret Ravine watershed include dirt and gravel roads and irrigation canals.

**Dirt and gravel roads** include the roads used in the watershed that have not been paved and are outside the heavily used OHV region mentioned above. Most of these roads have been created to serve rural residential structures and agriculture or are a result of OHV activities. Dirt and gravel roads differ in their contribution to flow/morphology and toxicity problems due to their different infiltration and erosion rates.

**Irrigation canals** operated and maintained by the Placer County Water Association (PCWA) are relics of the mining era. Today, the canal system carries water to irrigate rural residential land, supply stock ponds and to supply the water treatment plants that process most of the drinking water to the watershed. The irrigation system provides a conduit that transports water in rain events. To deal with the excess flow, PCWA has equipped the canals with spillways that allow water to leave the canal system unimpeded. The backbone of the PCWA canal system, the Boardman canal, ends in the lower part of Secret Ravine and provides water to Secret Ravine continuously throughout both the

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<sup>7</sup> Secret Ravine is considered a second-order stream. A second-order stream, as characterized by the "Strahler Order," is "a hierarchical ordering of streams based on the degree of branching." A second-order stream is a forked or branched stream composed of two first-order streams (Strahler 1957).

<sup>8</sup> Superimposition is the repeated use, or overlap, of limited spawning grounds (McNeil 1964).

summer and winter. The irrigation/canal system influences the flow and morphology of Secret Ravine.

### 3.4 Stressor Descriptions

#### 3.4.1 Sediment

Sediment and its relationship to salmon health is a well-researched - yet still very complicated - issue. The condition of the sediments within the spawning redds (located in the benthos) themselves is often referred to as substrate quality while the conditions within the water column are termed turbidity (or suspended sediment). Both substrate quality and turbidity will be evaluated here under the sediment stressor.

The greatest threat to the substrate quality (and thus the benthos or early life stages) is the accumulation of fine sediments on spawning gravels and food-producing areas (Cordone and Kelley 1961). We collected data on Secret Ravine over the summer of 2002 to assess substrate quality (Ayres, Love and Vodopals 2002) (Appendix J-1: Sediment).



K. VODOPALS COLLECTING SEDIMENT SAMPLES ON SECRET RAVINE

This data was then analyzed using methods developed by Tappel and Bjornn 1983 to estimate survival to emergence of the eggs to alevins. Survival to emergence usually relates negatively to percentages of small fines (Chapman 1988). A conservative estimate of average survival from a redd is estimated to be between 25% to 35% (Kondolf 2000).

Increased turbidities can be injurious to fish and aquatic life, particularly if conditions of high turbidity persist for a long duration (Newcombe and MacDonald 1991). Dry Creek Conservancy (DCC) turbidity data collected from December 2000 to November 2002 was used to assess impacts to the juvenile and adult life stages (within the water column).

Effects of turbidity on salmon health were estimated using methods developed by Newcombe and Jensen (1996). Units for the turbidity data from the DCC were NTUs (nephelometric turbidity units<sup>9</sup>). It was necessary to make the assumption that one NTU is equal to one milligram per liter of suspended sediment in order to estimate survivability. Suspended sediment concentrations were averaged (over all years sampled) for the months where each life stage occupied the stream (e.g. juveniles are present from

<sup>9</sup> A nephelometric turbidity unit is a measure of turbidity via refracted light.

February to May). Duration of exposure was assumed to apply to the entire life stage (four months for each life stage). Three sets of coefficients were given with the model to assess impacts to the three different life stages.

Suspended sediment concentrations and durations of exposure could then be used to estimate the scale of severity of ill effects<sup>10</sup> (Newcombe and Jensen 1996). The severity of ill effect values (SEV) range from zero to fourteen. Values from zero to three include nil and behavioral effects. Values ranging from four to eight contained the sublethal effects. SEV values of nine and ten included sublethal effects up to 20% mortality. SEV values from eleven to fourteen corresponded to mortalities of 20% up to 100%.

We assessed the impacts to the benthos utilizing the grain size distribution data (E. Ayres, J. Love and K. Vodopals 2002). The average (for all sampling sites) percentage of sediment (by weight) of sediment below 0.85 mm was 17% and 50% below 9.5 mm. The average mortality estimated from these distributions was roughly 67%.

SEV values in Secret Ravine ranged from six to 11 with an average approximately equal to a value of nine. Thus, average turbidity levels in Secret Ravine should not result in mortalities. Isolated storm events, however, could yield higher SEV values with the potential to result in mortality.

### 3.4.2 Flow

Risk from flow can have numerous effects on salmon. Some examples are: low flow during spawning, stranding during spawning, scour during incubation, bank erosion contributing fines to the redds, and low flow and stranding during juvenile downstream migration. General alterations to stream morphology can also occur when the flow regime is altered.

Flow data on Secret Ravine is limited. Only one storm gauge exists (located at China Garden Road, Appendix J-2) and was recently moved from another site. All records are suspect due to a lack of cross-sectional data at the previous site and inaccuracies of the analog device (R. Nelson, pers. comm. 2003).

Stranding was not assessed to be a problem based on observational data (G. Bates, pers. comm. 2002; R. Titus, pers. comm. 2002). Low flow was deemed not to be a problem (Swanson 2000). No data exists for bank erosion, but observational data concludes that there is a definite risk associated with this effect. General alterations to stream morphology are addressed under the "morphology" stressor. Thus, in the absence of sufficient flow data, only scour is addressed. This is the case for the MRRM. For the SDRM, however, observational flow data exists for the entire watershed and is used to assess impacts from flow.

<sup>10</sup> The severity of ill effect is an index of harm to chinook due to turbidity.

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Scour is the process by which peak flows disturb the streambed sediments; this can affect all three life stages along with general habitat conditions (Schuett-Hames et al. 1996). The risk of scour can be estimated based on the size of the substrate (streambed sediments). In general, smaller substrate sizes lead to increases in scour. A measure of substrate size is the  $D_{50}$ , which is the size of sediment at which 50% of the sample is less than that size by mass. The critical depth (the depth at which scour will begin) can be calculated from the  $D_{50}$  (Ritter et al. 2002).

High risk occurs when these critical depths are lower than optimal depths for migration, juvenile rearing and spawning (Table 5.3, Section 5.1.2.2). It should be noted that the risks to migration, juvenile rearing and spawning are not being assessed here (since sufficient flow data does not exist), rather these values are being used as baselines to assess the risk of scour. Migration is assumed to affect the adult life stage, juvenile rearing, and the early life stages.

Sediment data indicate that scour is occurring at levels below optimal flow levels for chinook migration, spawning and juvenile rearing. No flow data exists, however, to confirm this. Data from Li and Fields (1999) indicate that 27% of the habitat in Secret Ravine is unsuitable for juveniles due to poor flow conditions and 6% for adults.

### 3.4.3 Morphology

Gross stream morphology refers to average channel slope, approximate size of channel and floodplain width; habitat characteristics include pool/riffle sequences, sediment size, and frequency of large woody debris (University of Washington, Center for Streamside Studies 1999). For this assessment, the morphology stressor will refer to both general morphology and habitat characteristics.

In general, habitat frequency can be used to roughly gauge problems of cumulative watershed effects on streams (KRIS 2003). A stream or stream reach is rated high quality habitat if it contains more than 30% pools by length (PBL), has less than 50% embeddedness in most of its pool tail crests, and has at least 80% riparian canopy cover (KRIS 2003).

Site-specific stream morphology data exists only for the downstream reaches of Secret Ravine, based on a survey conducted by ECORP Consulting, Inc. Although substrate class size data existed in this dataset, no data existed regarding embeddedness. This risk assessment addresses canopy cover via the altered riparian vegetation stressor, thus, only chinook habitat (pools and riffles) will be addressed under morphology.

Data from ECORP (2002) and Li and Fields (1999) indicate an average deficiency (below 33%) in pools of approximately 16% and 13% for riffles.

### 3.4.4 Temperature

Water temperature has both direct and indirect effects upon the survival of the three life stages of chinook salmon. Such effects vary with the developmental stage of chinook salmon. Adverse conditions are intensified during drought conditions, causing water temperature to be unsuitable for maximum survival of all life stages of the fall-run chinook.

Available data suggests that none of the reaches of Secret Ravine present optimal temperatures for the various life stages of chinook throughout the entire year. However, the data is selectively relevant to each life stage due to the occupancy of the fall-run within Secret Ravine for only certain months of the year, as given by Rob Titus's determination of occupancy of different life stages in Table 2.1. Below are average water temperatures in Secret Ravine.

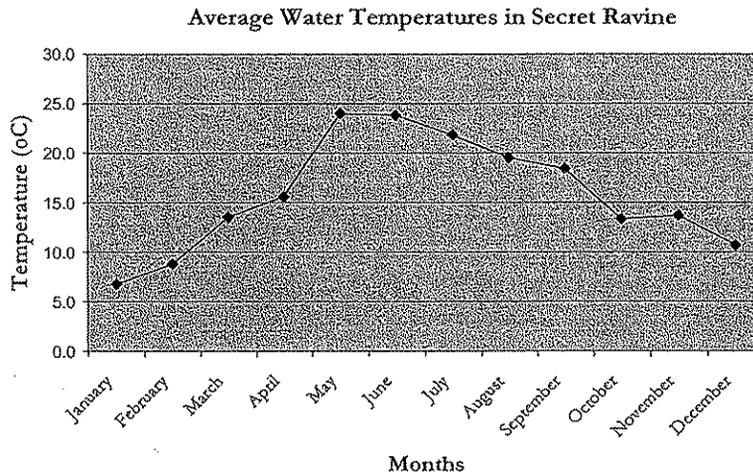


FIGURE 3.1 AVERAGE WATER TEMPERATURES IN SECRET RAVINE

#### Early Life Stages: Eggs & Yolk-sac Fry

Once spawning has taken place, the eggs of chinook salmon hatch in approximately two months, and the young remain in the gravel 2-3 weeks prior to emergence. Egg viability is measured by egg tolerance to both extremes of high and low temperatures. High temperatures produce abnormal physiological development during the egg stage, which prevents successful transition to active feeding in the fry stage.

Average maximum temperature during incubations should not exceed 14.5 °C. Temperatures ranging from 14.5 – 15.6 °C show reduced viability (Hicks 2000).

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Additional losses are incurred when salmon are held at temperatures from 15.6 – 17.8 °C; although these conditions have not been known to incur 50% mortality (Castaneda 2000). 100% mortality was reached in eggs and fry with initial temperatures of 18.3 °C (Seymour 1956).

Juvenile Phase: Fry

After emerging from the gravels, chinook fry remain in Secret Ravine for one to two weeks. Before emigration from the stream, however, juvenile chinook may be susceptible to temperature-related factors such as predation, and smoltification effects, in addition to decreased growth rates. Juvenile mortalities can also be ascribed to indirect temperature effects, such as a loss of equilibrium that can increase their susceptibility to predation.

The maximum weekly optimal temperature for juvenile salmon is 15.6 °C (Armour 1991). Juvenile mortalities increase incrementally if temperatures exceed the maximum daily average (Brett et al. 1982).

Adult Phase

After spending three to four years in the ocean, mature fall-run chinook salmon begin their return migration to Secret Ravine to spawn. Temperatures can be a serious direct or indirect threat to migrating salmon. In addition to adult lethality, temperatures can cause adults to stop migration (cessation). These cessations can reduce the overall fitness of migrant adults.

Migrating adult salmon do not feed in freshwaters and must consequently enter freshwater with sufficient fat and muscle reserves to supply their metabolic requirements up to and through the act of spawning. Warmer waters speed up the metabolism of chinook causing them to use up stored energy reserves at a faster rate. Higher metabolic rates may result in a decrease in the quality and quantity of eggs in addition to an overall reduction in the fitness of the adult fish that need to migrate and negotiate barriers and obstacles, excavate and guard redds, and complete the act of spawning (Hicks 2000).

Stream segments used by chinook salmon for migration corridors should not exceed 16.5 °C (Hicks 2000). Partial migration cessation occurs at 18.9 °C and full cessation/direct lethality occurs at 20.0 – 21.0 °C (Hallock et al. 1970).

### 3.4.5 Altered Riparian Vegetation

Nearly all vegetation in Secret Ravine, both understory and overstory, has been altered since the pre-Columbian times. The first major change in Secret Ravine vegetation probably occurred during the second-half of the mining period (late 1800s). The placer miners sluiced most of the topsoil in Secret Ravine in search of gold, and other precious metals, through hydraulic and later dredge mining (Holland 2000 and Haley 1923). In Holland's 2000 survey, evidence of the extent of the mining activities is presented. Holland states that, "All but 2,000 feet of this reach (near Sierra College) shows evidence