



IN REPLY REFER TO  
1-1-01-I-2899

# United States Department of the Interior

## Fish and Wildlife Service

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

August 27, 2001

Mr. Calvin Fong  
Chief, Regulatory Branch  
U.S. Army Corps of Engineers  
333 Market Street  
San Francisco, California 94105-2197

Subject: Comments Regarding the Russell City Energy Center (01-AFC-7)  
Hayward, California

Dear Mr. Fong:

This letter transmits our comments on the Russell City Energy Center (01-AFC-7) (power plant) located in Hayward, California. The U.S. Fish and Wildlife Service (Service) has reviewed the June 2001, Application for Certification along with additional information provided by the Calpine Corporation, Bechtel Enterprises Holdings, Inc. (applicants), and the California Energy Commission. The project involves development of a 600 megawatt natural gas fired energy generator plant with landscaping on approximately 15 acres of land, additional power lines near the Hayward shoreline, and reuse and discharge of treated wastewater. The proposed project site occurs adjacent or in close proximity to habitats supporting the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus obsoletus longirostris*), California least tern (*Sterna antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) which are protected under the Endangered Species Act of 1973, as amended (Act). Construction on the 15 acre parcel will result in fill of 1.68 acres of seasonal wetlands, which will likely require authorization under section 404 of the Clean Water Act.

Based upon the information provided, the Service has determined the project is likely to adversely affect the salt marsh harvest mouse, California clapper rail, California least tern, and western snowy plover. The Service recommends that the applicant address the following comments in development of a biological assessment:

- (1) Landscaping and infrastructure will provide roosting and perching locations for avian predators of the salt marsh harvest mouse, California clapper rail, California least tern, and western snowy plover, and an increase in powerlines may contribute to an increase in bird collisions with the powerlines.
  - a) To minimize availability of avian predator perches and nesting sites, landscaping at the project site should: i) be limited to trees with minimal perching surface or have flimsy branches; and, ii) be no taller than 20 feet. Examples of trees not suitable include palm trees and redwood trees.
  - b) All power lines serving the power plant should be fitted with bird flight deterrents. Similarly, all new towers should incorporate designs that minimize perching (*i.e.*, non-lattice tower structures and Nixalite).
- 2) Effluent discharge and storage may result in alteration of existing habitat through added freshwater in a salt marsh, which may result in an alteration of available prey for the California clapper rail, California least tern, and western snowy plover.
  - a) Additional information is needed to analyze potential impacts of waste water collection, treatment, and discharge. Specifically, the applicant should describe how the power plant may contribute to the freshening of local salt marshes, and how warm freshwater effluent may affect the availability of prey items for the California clapper rail, California least tern, and western snowy plover. Likewise, the applicant should describe how elevated concentrations of metals and other contaminants may impact federally listed species. The applicant should also discuss how the storm water detention basin will be managed to reduce effluent pulse discharge.
- 3) Generally speaking, energy production facilities are capable of inducing additional development within the region. Such development may affect federally listed species beyond the footprint of the project.
  - a) Discussion of indirect effects, including how the proposed project may induce growth in the surrounding counties. For instance, the information provided states that the power plant will supply energy for 600,000 people. Does this refer to existing, new, or planned development? The Service is concerned that energy provided for new or planned development may result in impacts to additional federally listed species not mentioned above.

Additionally, during our April 30, 2001, meeting the applicants stated they would investigate conservation actions such as purchasing fee title or a conservation easement of local salt marsh,

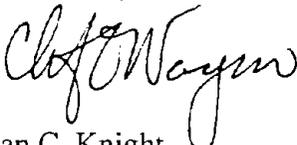
Mr. Calvin Fong

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tidal flats, or adjacent uplands to provide compensation for long-term impacts to species and resources. Please provide information on any proposed conservation actions for our review.

If you have further questions please contact Don Hankins or Daniel Buford at (916) 414-6625.

Sincerely,

  
 Jan C. Knight  
Chief, Endangered Species Division

cc:

Stuart Itoga, CEC, Sacramento, CA

Andrea Grenier, Calpine/Bechtel Joint Development, Pleasanton, CA

Brett Hartman, Foster Wheeler Environmental Corporation, Sacramento, CA

Eric Tattersall, CDFG, Yountville, CA

Mike Monroe, EPA, San Francisco, CA

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**United States Department of the Interior**  
**Fish and Wildlife Service**

**Sacramento Fish and Wildlife Office**  
**2800 Cottage Way, Room W-2605**  
**Sacramento, California 95825-1846**

IN REPLY REFER TO  
1-1-02-TA-267

November 26, 2001

Ms. Kae Lewis  
Project Manager  
California Energy Commission  
1516 9<sup>th</sup> Street  
Sacramento, California 95814

Subject: Endangered Species Issues Related to the Russell City Energy Center,  
Hayward, California

Dear Ms. Lewis:

This letter follows our November 8, 2001, meeting between you and your staff and Don Hankins of my staff. The purpose of the meeting was to review information provided with respect to the Russell City Energy Center and identify the need for further information to complete consultation on the project. To reiterate, the species we are considering affects to include the endangered salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*), California clapper rail (*Rallus obsoletus longirostris*), California least tern (*Sterna antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) which are protected pursuant to the Endangered Species Act of 1973, as amended.

Per our meeting four issues remain unresolved with respect to the project. These issues are as follows:

- (1) Acquisition of habitat adjacent to the Hayward Area Recreation District marsh to compensate for affects of the project. This should include a Service-approved conservation easement held by a Service approved conservation organization.
- (2) Development of a management plan that includes perch deterrents, monitoring, and a contingency plan.
- (3) Installation of bird flight diverters approved by the Service should be installed on ground wires and maintenance measures should be applied on an as needed basis

Ms Kae Lewis

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- (4) Development of a Service approved noise reduction plan for construction and operation activities.

The U.S. Fish and Wildlife Service cannot determine if this project will require formal or informal consultation until we have received sufficient information to clarify the issues above. If you have further questions regarding this letter, please contact Don Hankins or Daniel Buford at (916) 414-6625.

Sincerely,



 Jan C. Knight  
Chief, Endangered Species Division

cc

Calvin Fong, Corps, San Francisco, CA

Doug Davy, Foster Wheeler Environmental Corporation, Sacramento, CA

# **BIOLOGICAL RESOURCES**

Testimony of Stuart Itoga and Rick York

## **INTRODUCTION**

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This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Russell City Energy Center (RCEC). This analysis addresses potential impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of appurtenant facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the RCEC Application for Certification (AFC) (RCEC 2001), workshops, staff data requests and Calpine/Bechtel responses, site visits, project description clarifications and discussions with various state and federal agency representatives.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

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### **FEDERAL**

- **Clean Water Act of 1977**

Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26).

- **Endangered Species Act of 1973**

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

- **Migratory Bird Treaty Act**

Title 16, United States Code, sections 703-712, prohibits the take of migratory birds.

### **STATE**

- **California Endangered Species Act of 1984**

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

- **Nest or Eggs-Take, Possess or Destroy**

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

- **Birds of Prey or Eggs-Take, Possess, or Destroy**

Fish and Game Code section 3503.3 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

- **Migratory Birds-Take or Possession**

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

- **Fully Protected Species**

Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals that are classified as Fully Protected in California.

- **Significant Natural Areas**

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

- **Native Plant Protection Act of 1977**

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

- **California Code of Regulations**

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

- **Clean Water Act**

To verify that the federal Clean Water Act permitted actions comply with state regulations, the RCEC will need to get a Section 401 certification from the San Francisco Bay Regional Water Quality Control Board. The Regional Board provides its certification after reviewing the federal Nationwide Permit(s) that is provided by the U.S. Army Corp of Engineers (USACE).

## **LOCAL**

- **City of Hayward General Plan, Vegetation and Wildlife Habitats, General**

The planting of native vegetation should be encouraged, and whenever possible, vegetation removed during construction should be replaced. The City's remaining riparian plant communities should be protected and development should not encroach into important wildlife habitats. Documented habitats of unique, rare and/or endangered species of plants and wildlife should be protected, and application of toxic chemicals should be kept to a minimum.

- **City of Hayward General Plan, Vegetation and Wildlife Habitats, Shoreline**

Existing salt marshes should be preserved and new marshes established. Tidal flats and salt ponds of low salinity should be preserved for migratory waterfowl. Saltwater evaporation ponds should be preserved or enhanced in a manner commensurate with continued salt production, and activities that could have adverse effects on marine fisheries should be avoided.

## **SETTING**

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### **REGIONAL**

The proposed project is located in the upper portion of the San Leandro Valley near the eastern shore of San Francisco Bay. The city of Oakland lies to the north, the foothills of the Diablo Range to the east and the city of Fremont to the south. The proposed project region was historically dominated by coastal salt marsh habitat. The diverse coastal salt marsh community supports a wide range of organisms; however, urban and industrial development, salt evaporation ponds, and horticultural landscapes have replaced much of the original coastal marsh habitat. There are several wildlife habitat restoration projects in the area which are attempting to restore wetlands, but only remnants of the original coastal salt marsh now exist in the form of preserves and refuges.

### **LOCAL**

The proposed RCEC will occupy approximately 14.7 acres in the Industrial Corridor of the City of Hayward, California. Radio transmission facilities for station KFAX and a sandblasting facility presently occupy the proposed RCEC site. It is bordered to the north by the city of Hayward Water Pollution Control Facility, to the south by an area of uplands, a stormwater channel and retention pond and to the east by various industrial facilities. On the western border is a trucking terminal beyond which lie a variety of seasonal, fresh and brackish water wetlands.

Although the proposed project site is within an area zoned for industrial use, significant biological resources areas lie to the west and southwest of the proposed project site. These include: Hayward Area Parks and Recreation District's (HARD) salt marsh restoration project and East Bay Regional Parks District's (EBRPD) Cogswell Marsh and Salt Marsh Harvest Mouse Preserve. Approximately 20 acres of privately owned upland habitat is located south and southwest of the proposed RCEC site. This property forms a buffer zone between wetlands and areas of industrial development. The stormwater channel located south of the proposed site is used for regulating the flow of freshwater into the Salt Marsh Harvest Mouse Preserve.

Of the remaining habitat types within a one-mile radius around the proposed project site, approximately one-half include ruderal (weedy) vegetation and horticultural landscapes. The other habitat types found near the project include northern coastal salt marsh and brackish sloughs, emergent and brackish/freshwater marshes, annual grasslands and mud flats.

Annual grassland species found in the proposed project area are a mixture of grasses and herbaceous species. Non-native species include wild oat (*Avena fatua*), rip-gut brome (*Bromus diandrus*), bermuda grass (*Cynodon dactylon*), Italian rye grass (*Lolium multiflorum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), filaree (*Erodium cicutarium*) and bull mallow (*Malva nicaeensis*). Native species include three-week fescue (*Vulpia microstachys*), wild barley (*Hordeum leporinum*), coyote brush (*Baccharis pilularis*), wild pea (*Lathyrus* sp.) and California poppy (*Eschscholzia californica*).

Seasonal wetland vegetation on the proposed project footprint is dominated by salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), curly dock (*Rumex crispus*), and spike rush (*Eleocharis* sp.). Pickleweed (*Salicornia virginica*), brass buttons (*Cotula coronopifolia*) and various ruderal (weedy) species dominate wetland vegetation at the stormwater retention pond.

Calpine/Bechtel provided information for a variety of sensitive species likely to occur in the project area including: alkali milk-vetch (*Astragalus tener*), Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*), hairless popcorn flower (*Plagiobothrys glaber*), western burrowing owl (*Athene cunicularia hypugea*), salt marsh harvest mouse (*Reithrodontomys raviventris*), salt marsh wandering shrew (*Sorex vagrans halicoetes*), black skimmer (*Rynchops niger*), California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris obsoletus*), California least tern (*Sterna antillarum browni*), northern harrier (*Circus cyaneus*), and western snowy plover (*Charadrius alexandrinus nivosus*). For a list of sensitive species evaluated by Calpine/Bechtel see Table 1 below.

**Table 1. Sensitive species evaluated by Calpine/Bechtel for the RCEC project area.**

Scientific Name	Common Name	Federal/State/CNPS	Habitat in Impact area?
<b>Plants</b>			
<i>Astragalus tener</i> var. <i>tener</i>	Alkali milk-vetch	SC/--/1B	Yes
<i>Atriplex depressa</i>	Brittlescale	SC/--/1B	No
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	Big-scale balsamroot	--/--/1B	No
<i>Cordyanthus maritimus</i> ssp. <i>Palustris</i>	Point Reyes bird's-beak	SC/--/1B	Yes
<i>Cordyanthus mollis</i> ssp. <i>Hispidus</i>	Hispid bird's-beak	SC/R/1B	Marginal
<i>Fritillaria liliacea</i>	Fragrant fritillary	SC/--/1B	No
<i>Helianthella castanea</i>	Diablo rock rose	SC/--/1B	No
<i>Hemizonia parryi</i> ssp. <i>Congdonii</i>	Congdon's tarplant	SC/--/1B	No
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellog's horkelia	SC/--/1B	No
<i>Lasthenia conjugens</i>	Contra Costa goldfields	E/--/1B	No
<i>Lathyrus jepsonii</i>	Delta tulle pea	SC/--/1B	Marginal
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	SC/R/1B	No
<i>Plagiobothrys glaber</i>	Hairless popcorn flower	SC/--/1A	Yes
<i>Suaeda californica</i>	California seablite	PE/--/1B	Marginal
<b>Mammals</b>			
<i>Corynorhinus townsendii</i> <i>Townsendii</i>	Pacific western big-eared bat	SC/CSC	No
<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC/CSC	No
<i>Myotis evotis</i>	Long eared bat	SC/--	No
<i>Myotis thysanodes</i>	Fringed myotis bat	SC/--	No
<i>Myotis volans</i>	Long legged myotis bat	SC/--	No
<i>Myotis yumanensis</i>	Yuma myotis bat	SC/CSC	No
<i>Neotoma fuscipes annectens</i>	San Francisco dusky footed Woodrat	SC/CSC	No
<i>Reithrodontomys raviventris</i>	Salt marsh harvest mouse	E/E	Yes
<i>Sorex vagrans halicoetes</i>	Salt-marsh wandennng shrew	SC/CSC	Yes

<b>Birds</b>			
<i>Accipiter striatus</i> (nesting)	Sharp-shinned hawk	--/SSC	No
<i>Agelaius tricolor</i> (nesting Colony)	Tricolored blackbird	SC/CSC	No
<i>Amphispiza belli belli</i>	Bell's sage sparrow	SC/CSC	No
<i>Aquila chrysaetos</i> (nesting & Wintering)	Golden Eagle	--/SSC	
<i>Ardea herodias</i> (rookery)	Great blue heron	--/--	No
<i>Asio flammeus</i> (nesting)	Short-eared owl	--/SSC	No
<i>Aithya cunicularia hypugea</i> (burrow sites)	Western burrowing owl	SC/CSC	Yes
<i>Branta canadensis</i> <i>Leucopareia</i>	Aleutian Canada goose	T/--	No
<i>Buteo regalis</i>	Ferruginous hawk	SC/CSC	Winter foraging
<i>Charadrius alexandrinus</i> <i>Nivosus</i> (nesting)	Western snowy plover	T/CSC	No
<i>Circus cyaneus</i> (nesting)	Northern harrier	--/CSC	Yes
<i>Elanus leucurus</i> (nesting)	White-tailed kite	--/--	Yes
<i>Falco peregrinus anatum</i>	American peregrine falcon	--/E	Yes-foraging
<i>Geothlypis trichas sinuosa</i>	Common yellowthroat	SC/CSC	No-foraging
<i>Haliaeetus leucocephalus</i>	Bald eagle	T/E	No
<i>Laterallus jamaicensis</i> <i>Coturniculus</i>	California black rail	SC/T	No
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	SC/CSC	Yes
<i>Pelicanus occidentalis</i> <i>Californica</i>	California brown pelican	E/E	No
<i>Phalacrocorax auritus</i>	Double-crested cormorant	--/SSC	No
<i>Rallus longirostris obsoletus</i>	California clapper rail	E/E	No
<i>Rynchops niger</i>	Black skimmer	--/SSC	Yes
<i>Riparia riparia</i> (nesting)	Bank swallow	--/T	No
<i>Sterna antillarum browni</i> (nesting colony)	California least tern	E/E	No
<b>Reptiles</b>			
<i>Clemmys marmorata</i> <i>Marmorata</i>	Northwestern pond turtle	SC/CSC	Marginal
<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	SC/CSC	Marginal
<i>Masticophis lateralis</i> <i>Euryxanthus</i>	Alameda whipsnake	T/T	No
<i>Phrynosoma coronatum</i> <i>Frontale</i>	California horned lizard	SC/CSC	No
<b>Amphibians</b>			
<i>Ambystoma californiense</i>	California tiger salamander	C/CSC	No
<i>Rana aurora draytonii</i>	California red legged frog	T/CSC	No
<i>Rana boylei</i>	Foothill yellow legged frog	SC/CSC	
<b>Fish</b>			
<i>Hypomesus transpacificus</i>	Delta smelt	T/T	No
<i>Oncorhynchus kisutch</i>	Coho Salmon	T/E	No
<i>Oncorhynchus mykiss</i>	Central California Valley Steelhead	T/E	No
<i>Oncorhynchus mykiss</i>	Central California Valley Steelhead	T/E	No
<i>Oncorhynchus tshawytscha</i>	Winter run chinook salmon	E/E	No
<i>Pogonichthys macrolepotus</i>	Sacramento splittail	PT/CSC	No
<i>Sprnnchus thaleichthys</i>	Longfin smelt	SC/CSC	No
<b>Invertebrates</b>			
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	T/--	No
<i>Danaus plexippus</i>	Monarch butterfly	--/--	No
<i>Hydrochara nckseckeri</i>	Ricksecker's scavenger Beetle	SC/--	Marginal
<i>Tryonia imitator</i>	Mimic tryonia (California Brackishwater snail)	SC/--	Marginal

**Status Categories:**

Codes used in the table are as follows:

**E**= Endangered; **T**= Threatened; **R**= California Rare; **PE**= Proposed Endangered **C**= Candidate: Taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. **SC**= USFWS Species of Special Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking. **SSC**= CDFG "Species of Special Concern". CNPS (California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California, 1994) List: **1A**= Presumed extinct in CA; **1B**= Rare or Endangered in CA and elsewhere; **2**= R/E in CA and more common elsewhere; **3**= Need more information; **4**= Plants of limited distribution. -- = species not state listed.

## ANALYSIS OF IMPACTS

Primary concerns associated with construction and operation of the proposed RCEC are habitat loss and the project's potential impacts to the following sensitive species:

- Salt marsh harvest mouse (*Reithrodontomys raviventris*), federally and state listed endangered.
- California clapper rail (*Rallus obsoletus*), federally and state listed endangered.
- California least tern (*Sterna antillarum browni*), federally and state listed endangered.
- Western snowy plover (*Charadrius alexandrinus nivosus*), federally listed threatened and state Species of Special Concern.

To address potentially significant impacts to sensitive species and habitats associated with the RCEC, Calpine/Bechtel has submitted a Biological Assessment (BA) to staff and the U.S Fish and Wildlife Service (USFWS). Staff has reviewed the BA and Calpine/Bechtel's proposed mitigation measures and has proposed Biological Resources Conditions of Certification to reduce potential impacts to levels less than significant.

At the present time, the USFWS has not reviewed the BA for the RCEC and has not decided on the need for a formal Section 7 consultation with the USACE. The USFWS will decide, after review of the BA, if the impacts to federally listed species are adverse and if a formal consultation is necessary.

Staff is concerned that Calpine/Bechtel has not submitted, for review and approval by staff and the USFWS, an avian predator perch deterrent monitoring plan; furthermore, no formal proposal for habitat compensation has been submitted. A suitable plan for mitigating construction and operational noise also needs to be proposed. Although Calpine/Bechtel is currently developing mitigation measures, they have yet to be formally submitted and approved by the USFWS, USACE and staff. Staff requires an agreement on mitigation measures between Calpine/Bechtel, the USFWS and staff be reached before they recommend the project for certification.

## ENVIRONMENTAL CHECKLIST

	Potentially Significant	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>BIOLOGICAL RESOURCES – Would the project:</b>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X1			

	Potentially Significant	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>BIOLOGICAL RESOURCES – Would the project:</b>				
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	X1 Wetlands fill		X Effluent discharge	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X1-Noise X1-Habitat loss	X-Bird collision and electrocution		X Solids facility, gas and water lines, transmission line route, laydown areas
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

X1=Calpine/Bechtel is still developing mitigation measures in consultation with the USFWS, USACE and staff. Until adequate mitigation is agreed upon by the agencies, applicant and staff, the project has Potentially Significant and unmitigated impacts and staff can not recommend the project for certification.

## DISCUSSION OF IMPACTS

### Direct Impacts

#### a) Impacts to Listed or Sensitive Species: potentially significant impact.

Construction and operation of the RCEC could adversely affect the salt marsh harvest mouse, California clapper rail (*Rallus obsoletus*), California least tern (*Sterna antillarum browni*), and western snowy plover (*Charadrius alexandrinus nivosus*). The proposed architectural screening treatment and changes to the existing landscape could provide additional nest, perch and roost sites for avian predators (e.g. red-tail hawk, crows, ravens) of sensitive species in the proposed project area. To address these concerns, the applicant has proposed the following mitigation measures (Calpine/Bechtel 2001):

- All potential raptor perches on project infrastructure will be fitted with NIXALITE® or similar perch deterrent device.

- Landscaping at the project site will be limited to trees that discourage raptor perching.
- All new towers associated with the transmission line will be of non-lattice, single-pole construction.
- A raptor perching monitoring program will be developed and implemented.

Staff proposes that the project owner develop and implement a Sensitive Species Management Plan. This Management Plan must identify the landscaping species to be used. The landscaping species are to be chosen from a list provided by the USFWS (Calpine/Bechtel 2001). The Plan must also identify perch deterrent devices that will be installed on the power plant facilities such as the architectural façade and other facilities that may be of concern. And, this must address how the perch deterrent and landscaping will be monitored to determine if the devices and plans are effective, and what will be done if the perch deterrent plans are not effective. For more information, see Biological Resources Condition of Certification **BIO-14**.

It is staff's opinion that with the development and implementation of **BIO-14**, potential impacts to sensitive species can be reduced to levels less than significant. However, the USFWS has yet to review and approve the BA, and although Calpine/Bechtel submitted a BA for the RCEC, the raptor perching monitoring program proposed by Calpine/Bechtel (Calpine/Bechtel 2001) was not included. Before conclusions on impact significance associated with the proposed project can be made, staff requires review of this plan by the USFWS.

**b) Impacts to Surrounding Wetlands: less than significant with mitigation incorporated.**

Staff, USFWS, CDFG, HARD and EBRPD have all expressed concerns about the project's potential impacts to adjacent sensitive areas due to its stormwater runoff. Of particular concern are East Bay Regional Parks District's freshwater marsh and adjacent Salt Marsh Harvest Mouse Preserve.

Calpine/Bechtel has proposed a Storm Water Management Plan to be prepared. As part of their proposed plan, water discharge following storm events will be coordinated with the management of the HARD Marsh and the Salt Marsh Harvest Mouse Preserve to ensure discharge does not occur when salt water is being introduced into the marshes(Calpine/Bechtel 2001).

Staff proposes that the plan specifically address how stormwater runoff from the proposed project will be managed to prevent adverse impacts to surrounding wetlands managed by EBRPD and HARD. Staff concludes that if Calpine/Bechtel develops, and implements, the Stormwater Management Plan in consultation with all concerned agencies (including East Bay Regional Parks District and Hayward Area Recreation District), potential impacts to surrounding wetlands will be reduced to levels less than significant. For more information, see Biological Resources Condition of Certification **BIO-9** and Soil and Water Resources Condition of Certification **Soil & Water-3**.

**c) Impacts to San Francisco Bay: less than significant impact.**

The proposed project has the potential to affect shallow water habitat in San Francisco Bay. The project will share an existing effluent discharge pipe with the City of Hayward Water Pollution Control Facility (WPCF). The effluent from this pipe is discharged through the East Bay Dischargers Authority (EBDA) pipeline to the EBDA outfall in San Francisco Bay. The EBDA pipeline is shared by a number of users including the cities of: Hayward, Fremont, Union City, Newark, San Leandro and Livermore.

Calpine/Bechtel has indicated that, at peak conditions, the proposed project will use 5.27 million gallons per day (mgd) of secondary effluent obtained from the WPCF. The secondary effluent will be treated at the RCEC Advanced Wastewater Treatment Plant (AWT) so that tertiary effluent (water) may be used for cooling and process water. At peak levels, the RCEC will return 0.07 mgd of cooling wastewater and 1.47 mgd of wastewater from the AWT to the City of Hayward Water Pollution Control Facility (WPCF). A net reduction in the volume of liquid effluent discharged from the WPCF is expected (13.3 mgd to 9.5 mgd) due to losses at the RCEC from cooling tower evaporation.

The temperature of the cooling tower wastewater when it leaves the RCEC is projected to be between 85 and 100 degrees Fahrenheit (Calpine and Bechtel 2001b). AWT wastewater is not used in the cooling process and is not discharged at elevated temperatures. The cooling tower wastewater from the RCEC (0.07 mgd) will combine with AWT wastewater and large volumes of existing effluent from the WPCF and EBDA pipeline before discharge at the EBDA outfall approximately 12 miles from the RCEC. The dilution of RCEC wastewater with existing effluent and the distance traversed before discharge will provide sufficient cooling before discharge to the bay.

Staff concludes that wastewater from the proposed RCEC will have a less than significant impact on the water quality of shallow water habitats in the vicinity of the effluent outfall.

**c) Fill of Jurisdictional Wetlands: potentially significant impact.**

The proposed project will fill approximately 1.68 acres of jurisdictional wetlands. Calpine/Bechtel has completed a wetland delineation, which has been verified by the USACE. Calpine/Bechtel will need to procure an individual permit under Section 404 of the Clean Water Act, see Biological Resources Condition of Certification **BIO-7**.

In consultation with the USFWS, USACE and staff, Calpine/Bechtel is attempting to identify suitable habitat compensation to mitigate the fill of jurisdictional wetlands, but no formal habitat compensation measures have been proposed.

Staff concludes that the proposed project has the potential to adversely impact jurisdictional wetland habitat, but staff has proposed a condition that will mitigate this impact by requiring Calpine/Bechtel to provide compensation for the fill of 1.68 acres of wetlands. For more information see Biological Resources Condition of Certification, **BIO-10**.

#### **d) Construction and Operational Noise: potentially significant impact.**

Staff is concerned that construction impacts, particularly noise, could directly impact sensitive species nesting areas and wildlife using the surrounding areas. The USFWS has also raised this as a concern. Calpine/Bechtel estimates noise levels from pile-driving and steam blow activities will range from 106 dBA @ 50 feet to 65 dBA @ 1.02 miles (Calpine and Bechtel 2001c). Sensitive nesting species within a one-mile radius of the proposed project site could be exposed to noise levels above 60 dBA. A general rule for estimating noise levels at increasing distances is to decrease the noise level by 6 dBA as the distance is doubled (Birdsell 2001). Applying this to the pile-driving and steam blow activities provides estimated noise levels of 100 dBA @ 100 feet, 76 dBA @ 1,600 feet (> ¼ mile) and 70 dBA @ 3,200 feet (> ½ mile) respectively.

Numerous waterfowl and shorebird species inhabit the proposed project region, and some studies indicate ducks, geese, long distance migrants and colonial nesting birds are particularly susceptible to noise disturbances (Burger, 1981; Markham and Brechtel 1979). Recon (1980) concluded that noise levels above 60 dBA affected the territorial behavior of the Least Bell's vireo (*Vireo bellii pusillus*), a state and federally listed species not known from the RCEC project region. This noise level is also used by the USFWS as a reference point for evaluating noise impacts to wildlife (Buford, personal communication, 2001).

Noise disturbances from construction activities during the mating and nesting season may have an adverse effect on formation of pair bonds and/or reproductive success of sensitive species in the project area; furthermore, construction related disturbances could discourage habitat use by wildlife. Information obtained from the EBRPD documents the presence of several breeding/nesting species under federal/state protection within a one-mile radius of the project footprint (Taylor personal communication 2001). These include: federally and state endangered -salt marsh harvest mouse (*Reithrodontomys raviventris*), federally threatened, state species of concern-Western snowy plover (*Charadrius alexandrinus nivosus*), federally and state endangered-clapper rail (*Rallus longirostris obsoletus*), state species of concern, black skimmer (*Rynchops niger*) and the state and federally endangered-California least tern (*Sterna antillarum browni*). Joe Didonato, Wildlife Program Manager for the East Bay Regional Parks District, indicated the presence of snowy egret (*Egretta thula*) and black-crowned night heron (*Nycticorax nycticorax*) rookeries within one-quarter mile of the proposed project site (Didonato personal communication 2001). These rookeries are listed as sensitive by CDFG.

#### **Indirect Impacts**

Calpine/Bechtel has indicated that operational noise levels of the RCEC are expected to be approximately 69 dBA at the perimeters of the proposed project footprint (Calpine and Bechtel 2001c). Operational noise levels of the proposed project could indirectly impact upland habitat adjacent to the proposed RCEC site. This upland area is an important buffer zone between wetlands and areas of industrial development. Operational noise expected from a 24 hour/day, 7day/week operations schedule would exist for the life of the proposed power plant. Operational noise at the projected level, could adversely affect the physiology and behavior of wildlife in the adjacent upland area and other nearby wildlife habitats.

Calpine/Bechtel has proposed the following mitigation measures (Calpine/Bechtel 2001):

- Avoid sudden loud noises during construction and operation.
- Monitor species reaction to noise levels during construction. This can be accomplished by assessing waterfowl/shorebird breeding in adjacent habitats and assessing reaction of nesting pairs. If construction noise, particularly pile driving and steam blows, disturbs nesting birds, implement measures to protect the birds from the noise. These measures could include erection of temporary noise baffles in the pile driving area.
- Assess existing noise levels and strive to maintain or decrease these levels over time.

Staff concludes that construction and operational noise associated with the proposed RCEC could adversely affect sensitive species nesting areas and wildlife in the surrounding areas. Staff proposes that the project owner develop a construction and operational noise mitigation plan that addresses how noise impacts to state and federally listed nesting and breeding sensitive vertebrate species will be minimized during construction and for the life of the project. For more information, see Biological Resources Condition of Certification, **BIO-12**.

**d) Permanent and Temporary Habitat Loss: potentially significant impact.**

Calpine/Bechtel conducted sensitive species surveys for the proposed project site and for a one-mile radius around it. Calpine/Bechtel indicated no sensitive species were observed during these surveys, but the proposed power plant site is utilized by a variety of wildlife, and nearby open-space areas are used by a variety of sensitive nesting species (Itoga personal observation 2001, Taylor 2001, Didonato 2001).

Although the proposed plant site is zoned industrial, current use leaves most of it as open-space. Construction of the proposed RCEC will displace wildlife species from the wetland and grassland habitats on the project site. In addition, construction of the proposed project will eliminate habitat available to species in nearby wetland areas. Kantrud and Stewart (1984) and Cowardin (1969), found that some wetland species require a combination of wetland and other land cover types. Daily movement between pickleweed (*Salicornia virginica*) and grasslands often are exhibited by the state and federally listed endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) (California Department of Fish and Game, 1990). Many wildlife species are known to move between different habitat types in sustaining their daily energy budgets.

The proposed power plant will occupy approximately 14.7 acres. Construction of the proposed RCEC will result in the permanent loss of approximately 9.4 acres of annual grassland and approximately 1.68 acres of jurisdictional wetlands.

Calpine/Bechtel indicated that expansion of PG&E's East Shore Substation will be needed to accommodate the input from the proposed RCEC (Calpine and Bechtel 2001) and that acquisition of approximately two acres of PG&E land will also be required (Calpine and Bechtel 2001b). The land proposed for substation expansion supports ruderal vegetation and is currently undeveloped. Total acreage required for

the proposed expansion will need to be included in calculation of project impact acreage.

In addition to permanent habitat loss, Calpine/Bechtel has proposed a 10-acre construction laydown/worker parking area to be located on open land south of PG&E's East Shore Substation (Calpine and Bechtel 2001b). As with the substation expansion, staff considers the open land around the substation to be habitat. The use of this area for parking will temporarily disturb habitat and will be included in the calculation of project impact acreage as temporary habitat loss. Although Calpine/Bechtel has informally discussed habitat compensation measures with USFWS, EBRP and staff, no formal mitigation proposal has been made.

Staff concludes that the proposed project will cause permanent and temporary losses of habitat. Consequently, staff has proposed conditions that will require Calpine/Bechtel to provide habitat compensation for the permanent losses of 9.4 acres of annual grassland, 1.68 acres of seasonal wetlands and 2.0 acres of ruderal habitat. In addition, compensation for temporary habitat loss associated with 10.0 acres of ruderal habitat will also be required. For more information see Biological Resources Condition of Certification **BIO-10**.

#### **d) Collision and Electrocutation: less than significant impact**

The close proximity of the proposed project to sensitive biological resource/open-space areas combined with diverse communities of avian species create the potential for direct impacts to birds through electrocution or collisions with transmission lines/towers, architectural screening, boiler, cooling tower and exhaust stacks. During storms, birds may be attracted to the power plant by artificial night lighting thereby increasing the risk of collisions.

Birds can be electrocuted when they simultaneously contact two conductors of different phases or contact a conductor and a ground. Bird electrocutions are commonly associated with distribution lines, not transmission lines, due to closer spacing of conductors and grounds (APLIC 1996). Staff anticipates that the proposed RCEC transmission line towers and conductors will be constructed to federal standards (PUC 1981 - General Order 95). These standards require minimum distances between conductors, and therefore make it highly unlikely that even very large birds (hawks, eagles, etc.) are likely to contact different phases or contact a conductor and a ground. Staff concludes that the proposed RCEC transmission lines will not pose a significant electrocution hazard to birds in the project area.

Avian collisions with architectural screening, boiler stacks, cooling towers and turbine stacks are possible; however, Calpine/Bechtel has indicated that the tallest stack proposed for the RCEC heat recovery steam generator (HRSG) will not exceed 145 feet in height. The architectural screening surrounding the HRSG units and stacks will be approximately 135 feet tall. The cooling tower stacks and associated screening have a projected height of 64 feet. These structures are considered relatively short and of low risk for bird collisions, as most documented bird collision deaths are associated with facilities ranging from 500 to 650 feet high (Goodwin 1975, Maehr et al. 1983, Weir 1974, Zimmerman 1975). Additionally, lighting will be shielded to direct light downward,

reducing the risk of bird attraction. (see Visual Resources Assessment, Condition of Certification **VIS-5**). For these reasons, staff does not anticipate significant impacts to birds from collisions with stacks or architectural screening.

**d) Collisions: less than significant with mitigation incorporated**

Collisions with transmission lines have also been documented as a source of bird mortality. Commonly associated with migratory birds, collisions are likely to occur during periods of darkness or inclement weather, and usually occur when birds impact ground wires located above the conductors. In consultation with EBRPD, USFWS and CEC staff has determined that because of the large numbers of migratory birds in the proposed project area, the ground wire(s) associated with the project could pose a significant collision hazard if they are located above the conductors.

To minimize the potential for bird collisions with ground wires, Calpine/Bechtel has proposed the use of bird flight deterrents, such as streamers (Calpine/Bechtel 2001).

Staff concludes that the proposed transmission line will pose a significant collision hazard to birds in the area; however, the installation of bird flight diverters on transmission line ground wires will reduce the risk of collision to levels less than significant. Staff proposes the use of the Swan Flight Diverter. See Biological Resources Condition of Certification **BIO-13**.

**d) Solids handling facility, laydown areas and linears: no impact.**

Calpine/Bechtel has proposed a relocation plan to move a portion of the RCEC AWT across Enterprise Avenue to the WPCF. The proposed relocation will occupy 1.38 acres within the WPCF fence line. Currently, the proposed relocation site is used for drying and storing sludge created in the water treatment process. The proposed area is bordered on the north by auto salvage yards and to the west by sewage ponds. Movement of sludge for drying and storage is done by heavy machinery leaving the area highly disturbed. Foster Wheeler staff conducted a sensitive species survey of the proposed site on September 5, 2001, and concluded the proposed site did not contain suitable sensitive species habitat (Calpine and Bechtel 2001b). Staff agrees with their assessment and concludes that relocation of the solids handling facility to the proposed WPCF site will not impact biological resources in the area.

Calpine/Bechtel has proposed two additional construction laydown areas. The two sites consist of a 10-acre trailer storage area off Depot Road and a five-acre trailer storage site located on Enterprise Avenue. These proposed laydown areas are paved/graveled areas with only sparse ruderal vegetation. Considering the disturbed nature and current levels of industrial activity already affecting these proposed areas, staff concludes that there will be no impacts to biological resources from the use of these areas for construction laydown and worker parking.

Calpine/Bechtel has proposed approximately 0.9 miles of new pipeline to supply the RCEC with natural gas from an existing PG&E line. The proposed RCEC line will be routed beneath paved roadways, a graveled portion of a Berkeley Farms processing plant and a set of Union Pacific Railroad (UPRR) tracks. The proposed pipeline will be connected to the PG&E pipeline located west of the UPRR tracks. Because of the

existing urban development and disturbance along the proposed route, staff anticipates no impacts to biological resources from construction of the natural gas pipeline.

To connect the RCEC to PG&E's Eastshore Substation, an overhead transmission line has been proposed. Calpine/Bechtel has proposed 600 feet of new line from the RCEC switchyard to the existing East Bay-Grant 115-kV transmission line corridor, approximately 1.1 miles of new 230-kV overhead line and seven additional towers. The tie-in from the East Bay-Grant Corridor lines to the Eastshore Substation will require approximately 500 feet of additional transmission line (Calpine and Bechtel 2001).

Calpine/Bechtel originally indicated five new towers would replace existing towers in the East Bay Grant 115-kV corridor. It has now been proposed that the new line will be constructed parallel to the existing one (Calpine and Bechtel 2001b). The parallel lines will be spaced 80 feet apart. Calpine/Bechtel has indicated that seven tubular, not lattice, towers will be constructed (Calpine and Bechtel 2001b). Staff believes that tubular towers are more desirable than lattice towers since tubular towers provide minimal perch opportunities for birds and pose less of a collision threat.

The proposed RCEC transmission line will traverse areas of commercial and industrial development. Calpine/Bechtel has indicated that five of the proposed tower locations are covered with asphalt. The sixth will be located within the State Route 92 on-ramp loop. Calpine/Bechtel has indicated that the ground within this loop is covered with sand, piles of dirt and asphalt fill. The seventh tower will be located north of Enterprise Avenue near the proposed RCEC site (Calpine and Bechtel 2001b). Sensitive species surveys done by Calpine/Bechtel for the originally proposed transmission line were conducted for 1000 feet on each side of the existing line (Calpine and Bechtel 2001). Staff has reviewed the proposed tower locations and concludes that because the proposed route will traverse disturbed areas and will be located within the existing transmission line corridor, the original transmission line surveys conducted by Calpine/Bechtel are sufficient to address potential impacts caused by construction of the newly proposed transmission line, and staff anticipates no impacts to biological resources along the proposed route.

Calpine/Bechtel has proposed the construction of the RCEC Advanced Wastewater Treatment Plant (AWT) for treatment of secondary effluent obtained from the City of Hayward Water Pollution Control Facility (WPCF). Enterprise Avenue separates the proposed RCEC and the WPCF. The AWT will process secondary effluent delivered from the WPCF before use as cooling and process water. After cycling through the cooling process, the water will be returned to the wastewater treatment plant. Calpine/Bechtel has indicated that all pipelines proposed for inflow and outflow of industrial and potable water will be routed underground. Inflow and outflow pipelines connecting the WPCF and the proposed RCEC will be routed beneath Enterprise Avenue. Calpine/Bechtel has proposed a connecting pipeline from the East Bay Dischargers Authority pipeline to the AWT. This connecting pipeline will also be routed underground beneath Enterprise Avenue and the WPCF site. Because the pipelines will be routed beneath disturbed/developed areas, staff does not anticipate any adverse biological resource impacts due to construction of water pipelines.

**e) Local policies or ordinances: no impact.**

Staff does not anticipate any conflicts with local policies or ordinances.

**f) Habitat conservation plans: no impact.**

HARD has filed a local plan identified as the Hayward Shoreline Enhancement Plan. Following conversations with HARD staff (Willyerd personal communication, September 10, 2001), who have reviewed the proposed RCEC project, staff has concluded that the RCEC will not be in conflict with the Hayward Shoreline Enhancement Plan or any other approved local, regional, or state habitat conservation plan.

## **CUMULATIVE IMPACTS**

Staff concludes that this project may have cumulative effects due to anticipated habitat impacts (loss of wildlife habitat and wetlands), increased noise, increased risk of bird collisions with transmission line ground wires and impacts to sensitive species by predatory bird species. The loss of wetlands and wildlife habitat have resulted from various projects in the proposed project area, and construction of the RCEC will develop some of the last remaining upland areas adjacent to the Hayward Shoreline. These upland areas act as buffer zones between wildlife habitat and areas of industrial development. In addition, industrial activities associated with these developments have caused an increase in noise levels, to which the proposed project could contribute. Increased noise levels could potentially impact nesting sensitive species and other wildlife in areas close to the plant site. Staff is also concerned that the addition of new transmission line ground wires within the existing East Bay-Grant Corridor would increase the risk of collisions for migratory birds in the area, and the proposed project could provide additional perch opportunities for avian predators of sensitive species in the project area.

## **COMPLIANCE WITH LORS**

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The proposed project will fill 1.68 acres of seasonal wetlands, and Calpine/Bechtel will need to apply for, and procure, a USACE Section 404 permit to be in compliance with the federal and state Clean Water Acts.

The USFWS requested a Biological Assessment for the proposed RCEC and is informally discussing the project. This document has been submitted but needs to be reviewed by the USFWS, USACE and CDFG before a determination of need for a formal Section 7 consultation can be made. Until the USFWS makes a decision on the need for a formal Section 7 consultation, CEC staff can not determine the proposed project's compliance with applicable LORS. However, Biological Resources Condition of Certification **BIO-6** requires all consultation mitigation measures be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan (Biological Resources Condition of Certification, **BIO-4**).

## **FACILITY CLOSURE**

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Sometime in the future, the RCEC will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM). Facility Closure mitigation measures will also be included in the Biological Resources Mitigation Implementation and Monitoring Plan prepared by the applicant.

The restoration of annual grassland and seasonal wetland habitats on the proposed project footprint will need to be addressed in any discussion of facility closure. Habitat restoration plans should include such tasks as the removal of all structures and the immediate implementation of habitat restoration measures to establish native plant species and native habitat.

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the RCEC. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the facility closure measures provided in the on-site contingency plan and Biological Resources Mitigation Implementation and Monitoring Plan would need to be implemented.

## **RESPONSES TO PUBLIC AND AGENCY COMMENTS**

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### **AGENCY COMMENTS**

#### **U.S. Fish and Wildlife Service**

**USFWS (8-27)-1:** *Landscaping and infrastructure will provide roosting and perching locations for avian predators of the salt marsh harvest mouse, California clapper rail, California least tern, and western snowy plover and an increase in power lines may contribute to an increase in bird collisions with the power lines.*

*Staff response:* In consultation with USFWS and the CEC, Calpine/Bechtel is developing a landscape plan to deter the perching, nesting/roosting of avian predators that are known to prey upon local sensitive species. A monitoring plan will also be implemented to determine if the perch deterrents are effective. If the monitoring plan indicates that perch deterrents are not effective, a sensitive species management plan may be needed. With respect to power lines and bird collisions, tubular steel towers will be used for all transmission line towers associated with the RCEC. Tubular towers greatly reduce the collision hazard for birds, but they also offer only limited perch opportunities. Regarding bird collisions with power lines, Calpine/Bechtel is investigating the feasibility of using sub-surface ground wire/s on the RCEC transmission lines. If sub-surface ground wires can not be used, staff will require bird flight diverters be placed on ground wires.

**USFWS (8-27)-2:** *Effluent discharge and storage may result in alteration of existing habitat through added freshwater in a salt marsh, which may result in an alteration of available prey for the California clapper rail, California least tern and western snowy plover.*

*Staff response:* Effluent discharge from the proposed RCEC will not adversely affect the local salt marsh or shallow water habitats in San Francisco Bay. The proposed RCEC will obtain approximately 5.27 million gallons/day of secondary effluent from the City of Hayward Wastewater Treatment Plant (WWTP). This water will then be treated at the RCEC Advanced Wastewater Treatment Plant to tertiary effluent for use as cooling and process water. After the tertiary effluent has been used as cooling and process water, approximately 1.48 mgd will be returned to the WWTP where it will be mixed with existing secondary effluent before being discharged to the bay. The overall effect of the RCEC wastewater to the EBDA discharge would be a 3.7 mgd reduction in the volume of liquid effluent discharged to the bay.

**USFWS (8-27)-3:** *The applicant stated they would investigate conservation actions such as purchasing fee title or a conservation easement of local salt marsh, tidal flats or adjacent uplands to provide compensation for long-term impacts to species and resources.*

*Staff response:* Although Calpine/Bechtel has not formally proposed any habitat compensation measures, staff will propose conditions that would require Calpine/Bechtel to mitigate for loss of wetlands, annual grasslands and other habitats, as well as impacts to sensitive species.

### **East Bay Regional Parks District**

**EBRPD (8-20)-1:** *The project information states that "temporary fencing" will be provided to ensure that entry into the sensitive salt marsh areas is avoided. The project does not adequately discuss or provide mitigation for the potential loss of sensitive habitat.*

*Staff response:* Calpine/Bechtel will be required by staff to provide habitat compensation for the loss of wetlands and annual grassland habitats. Appropriate compensation for loss of habitat and impacts to sensitive species will be developed in consultation with the USFWS, USACE, CDFG, EBRPD and staff.

**EBRPD (8-20)-2:** *The project information fails to adequately address potential impacts to the District's Salt Marsh Harvest Mouse Preserve. The preserve is contiguous with similar habitat owned by the City of Hayward. Runoff from the project during rain events, emergencies, and normal routine may carry toxic substances into these lands and be distributed throughout the preserve. Additionally, the hydraulic dynamics of the preserve are linked with the District's operation of the freshwater marsh. Draining the preserve is dependent on the management of the freshwater marsh and it can take several days to drain water to reduce the impacts to the preserve.*

*Staff response:* To avoid negative impacts to the surrounding wetland habitats, Calpine/Bechtel has agreed to work with personnel from HARD and the EBRPD in

developing a storm water management plan. Staff will require that this plan be completed prior to the start of project construction.

**EBRPD (8-20)-3:** *New available perches can increase predation or harassment of sensitive species by perching birds. The project information fails to identify the type of devices and document their level of success in reducing perching birds.*

*Staff response:* Staff will propose that Calpine/Bechtel develop a landscape plan in consultation with USFWS, CDFG and staff. This plan will include all methods to be used to deter perching, nesting/roosting of avian predators that could prey on sensitive species in the area. A monitoring plan will also need to be developed to assess the effectiveness of perch deterrents and a contingency plan to be implemented should monitoring indicate that the perch deterrents are ineffective. The landscaping plan, perch deterrent devices, monitoring plan, and contingency plan will need to be approved prior to the start of project construction.

**EBRPD (8-20)-4:** *Many of the potentially impacted plants would not be identifiable until December, rather than in February, March and April times identified. Scientific surveys need to be taken at the appropriate time of year to determine the extent of potentially significant impacts to many of the special status plant species.*

*Staff response:* Upon reviewing the sensitive plants survey information submitted by the applicant, staff concludes that suitable sensitive plant habitat does not exist at the project site or along the transmission line corridor. Further, survey protocols used by the applicant were appropriate and conducted over sufficient time to detect the presence of sensitive plant species in the area.

### **City of Hayward**

**CITY (7-27)-1:** *Show how structures will be designed to prevent raptors from perching on structures where they could otherwise easily prey upon nearby protected species.*

*Staff response:* Staff will require that Calpine/Bechtel develop, in consultation with the USFWS, CDFG and EBRPD, a perch deterrent strategy to prevent raptors from perching and to assess the effectiveness of the devices and plan. If the plan is not successful, a contingency plan will need to be implemented.

## **PUBLIC COMMENTS**

### **Audrey Lepell, letter dated August 21, 2001:**

Will the screened building, towers and other structures be too attractive to the birds on this international flyway? Will any design be too attractive to the bird life that lives year round in the Bay Area?

*Staff response:* In addition to implementing landscape plan designed to deter perching opportunities, the applicant will control bird access through the use of exclusion techniques. These techniques will be reviewed and approved by the USFWS, DFG and the CEC.

**Viola Saima-Barklow, public comment form dated August 20, 2001:**

*What impact will the proposed project have on nesting swallows?*

*Staff response:* Staff has been informed by Calpine/Bechtel that the proposed power plant facilities will not provide suitable nesting opportunities since the majority of the facilities will lack overhangs and eaves. In addition, the majority of the project facilities will be smooth, painted, metal surfaces that are not used by swallows for nesting. The applicant has indicated that birds will be discouraged from using the RCEC for nesting through exclusion devices. Any exclusion devices employed by Calpine/Bechtel will need to be approved by the USFWS, CDFG and staff.

## **CONCLUSIONS**

Staff has identified several potential impacts to sensitive species and habitat associated with the proposed project. Three impacts remain unmitigated. Calpine/Bechtel proposed a list of mitigation measures in their Application for Certification and Biological Assessment (Calpine/Bechtel 2001, 2001c) and are currently developing an off-site mitigation plan. Mitigation strategies in the areas of predator perch deterrent monitoring, construction and operational noise, and habitat compensation are currently being developed. However, the USFWS has not indicated if the identified impacts to federally-listed species (perching of avian predators) are adverse or if a Section 7 No  
B.O. Biological Opinion will be necessary for the RCEC project. At this point, the USFWS has continued to *informally* discuss the project and the applicant's proposed mitigation with the U. S. Army Corps of Engineers. As requested by the USFWS, Calpine/Bechtel submitted a Biological Assessment, which is in review by the USFWS. If additional impacts to federally listed species are identified, or if identified impacts are deemed adverse, then an informal consultation or a Section 7 Biological Opinion will be necessary. No

The USFWS may require mitigation that is more extensive than what is currently proposed by the applicant. Staff is concerned that Calpine/Bechtel has not proposed any formal habitat compensation measures or a raptor perching monitoring program as part of the BA. A suitable noise mitigation plan also needs to be developed. Staff concludes that the proposed RCEC could adversely affect biological resources in the project area without these three measures, and have required them as Biological Resources Conditions of Certification (**BIO-10**, **BIO-12** and **BIO-14**). The Biological Resources staff requires an agreement be developed on the types of mitigation required before they could recommend the project for certification.

## **CONDITIONS OF CERTIFICATION**

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### **Designated Biologist**

- ✓ **BIO-1** Construction-site and/or ancillary facilities preparation (described as any site mobilization activity other than allowed geotechnical work) shall not begin until an Energy Commission Compliance Project Manager (CPM) approved Designated Biologist is available to be on site.

**Protocol:** The Designated Biologist must meet the following minimum qualifications:

- 1) a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field,
- 2) three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society,
- 3) one year of field experience with resources found in or near the project area, and
- 4) an ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resource tasks that must be addressed during project construction and operation. If the CPM determines the proposed designated biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved designated biologist needs to be replaced, the project owner shall obtain approval of a new designated biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement.

*Service  
approval  
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**Verification:** At least 30 days prior to the start of any site mobilization activities at the project site and/or at ancillary facilities, the project owner shall submit to the CPM for approval, the name, qualifications, address, and telephone number of the individual selected by the project owner as the designated biologist. If a designated biologist is replaced, the information on the proposed replacement as specified in the condition must be submitted in writing to the CPM. If the project owner is not in compliance with any aspect of this condition, the CPM will notify the project owner of making this determination within 14 days of becoming aware of the existence of any noncompliance. Until the project owner corrects any identified problem, construction activities will be halted in areas specifically identified by the CPM or designee as appropriate to assure the potential for significant biological impacts is avoided. For any necessary corrective action taken by the project owner, a determination of success or failure of such action will be made by the CPM after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

**BIO-2** The CPM approved Designated Biologist shall perform the following duties:

- 1) advise the project owner's supervising construction or operations engineer on the implementation of the biological resource conditions of certification,
- 2) supervise or conduct mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species, and

3) notify the project owner and the CPM of any non-compliance with any condition.

**Verification:** The Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM.

**BIO-3** The project owner's supervising construction and operating engineer shall act on the advice of the Designated Biologist to ensure conformance with the biological resource conditions of certification.

**Protocol:** The project owner's supervising construction and operating engineer shall halt, if needed, all construction activities in areas specifically identified by the Designated Biologist as sensitive to ensure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

- 1) advise the project owner and the supervising construction and operating engineer when to resume construction, and
- 2) advise the CPM if any corrective actions are needed or have been instituted.

**Verification:** Within two working days of a designated biologist notification of non-compliance with a Biological Resources condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

### **Biological Resources Mitigation Implementation and Monitoring Plan**

- ✓ **BIO-4** The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

**Protocol:** The BRMIMP shall identify:

- 1) All Biological Resource Conditions included in the Commission's Final Decision;
- 2) A copy of the final, approved Sensitive Species Management Plan. The final, approved plan will include detailed information regarding how nesting, perching/roosting of raptors and corvids (crows and ravens) will be discouraged. Also to be included are the final plans for monitoring the

success of perch deterrents and a contingency plan to be implemented if predation of sensitive species is determined to be significant.

3) A copy of the final Storm Water Management Plan to be implemented so sensitive wetland habitats in the project area will not be impacted by the RCEC.

4) A list of all measures which will be implemented to mitigate the construction and operational noise impacts caused by the proposed RCEC;

5) A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;

6) A list of all terms and conditions set forth by the USACE Section 404 permit and state 401 certification;

7) Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;

8) All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction;

9) Aerial photographs (scale 1:200) of all areas to be disturbed during construction activities-one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen.

10) Duration for each type of monitoring and a description of monitoring methodologies and frequency;

11) Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

12) All performance standards and remedial measures to be implemented if performance standards are not met;

13) A discussion of biological resource-related facility closure measures;

14) A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;

15) A copy of the Section 7 Biological Opinion, or letter from the USFWS stating the project will not require one, and incorporation of all terms and conditions into the final BRMIMP.

16) A discussion of bird flight diverters and how they will be replaced and maintained during the life of the project.

17) Written verification that the required habitat compensation has been purchased and a suitable endowment has been provided to manage the habitat compensation acreage in perpetuity.

18) A copy of the final construction and operational noise mitigation plan.

**Verification:** At least 30 days prior to start of any site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

### **Worker Environmental Awareness Program**

**BIO-5** The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

Protocol: The Worker Environmental Awareness Program must:

- 1) Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
- 2) Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
- 3) Present the reasons for protecting these resources;
- 4) Present the meaning of various temporary and permanent habitat protection measures; and
- 5) Identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

**Verification:** No less than 30 days prior to the start of any site mobilization activities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and keep record of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

### **USFWS Biological Opinion**

**BIO-6** The project owner must provide a copy of the USFWS Biological Opinion, or a letter from the USFWS stating the project does not require a Biological Opinion, to the Compliance Project Manager.

**Verification:** No less than 30 days prior to the start of any site mobilization activities, the project owner must provide the CEC CPM with a copy of the Biological Opinion. If a Biological Opinion is not needed, then the project owner must provide the CEC CPM with a copy of the USFWS letter stating that conclusion. All terms and conditions of any USFWS decision will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

### **U. S. Army Corps of Engineers Section 404 Permit**

**BIO-7** The project owner shall provide a final copy of the Section 404 permit. The project owner will implement the terms and conditions contained in the permit.

**Verification:** No less than 30 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the permit required to fill on-site wetlands. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

### **San Francisco Bay Regional Water Quality Control Board Certification**

**BIO-8** The project owner will acquire and implement the terms and conditions of a San Francisco Bay Regional Water Quality Control Board Section 401 State Clean Water Act certification.

**Verification:** No less than 30 days prior to the start of any site mobilization activities, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project's BRMIMP.

## Storm Water Management Plan

where is it drawn to?

**BIO-9** The project owner shall develop a RCEC Storm Water Management Plan in consultation with the U.S. Fish and Wildlife Service, East Bay Regional Parks District, Hayward Area Parks and Recreation District, and staff.

**Verification:** The project owner will submit to the CPM a Storm Water Management Plan at least 60 (sixty) days prior to the start of any site mobilization activities (See Soil and Water Resources, Condition of Certification **Soil & Water-3**). The final approved plan will also be contained in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

## Habitat Compensation

?

**BIO-10** The project owner shall provide suitable habitat compensation for the project's permanent and temporary habitat impacts.

Protocol:

Suitable habitat compensation must

ERIC TATTERSOL  
→ YOUNTVILLE

- 1) be agreed to by the USFWS, CDFG, USACE, and staff;
- 2) adequately compensate for the RCEC habitat impacts and
- 3) include a suitably large endowment to fund the perpetual care of the compensation habitat. The endowment can be calculated using the Center for Natural Lands Management Property Analysis Record computer data base tool.

**Verification:** Within one week of project certification, the project owner must provide written verification to the CPM that the required habitat compensation has been purchased and that the endowment is in place to fund perpetual compensation habitat management.

## Facility Closure

**BIO-11** The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project BRMIMP.

**Verification:** At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

## Construction and Operational Noise Levels

**BIO-12** The project owner will develop a construction and operational noise mitigation plan that addresses how noise impacts to state and federally listed nesting and breeding sensitive vertebrate species will be minimized during construction and for the life of the project.

**Protocol:** The plan will discuss how pile-driving and HRSG steam blow noise can be controlled, or not be allowed, during bird breeding or nesting from mid-March to mid-August or that other mitigation measures (e.g. muffler, sound walls) can be implemented to achieve the desired effect. Regarding operational noise, the noise mitigation plan will describe how the noise level will be reduced to no more than 65 dBA at the project's southern fence line where it borders adjacent open-space areas. The mitigation plan shall also discuss how the operational noise level will be maintained at the specified level and how the operational noise level will be monitored for the life of the project. Proposed strategy, all supporting materials and all assumptions must be included in the proposed construction and operational noise mitigation plan. The final plan must be developed in consultation with the USFWS, CDFG, EBRPD, and staff.

**Verification:** No later than 30 days prior to the start of any site mobilization activities, the project owner will provide to the CEC CPM with a copy of the final, agency approved construction and operational noise mitigation plan.

### ✓ **Bird Flight Diverters**

**BIO-13** Bird flight diverters will be placed on all ground wires associated with the RCEC power plant.

**Protocol:** During construction of the RCEC transmission line, bird flight diverters will be installed to manufacturer's specification. The USFWS, CDFG, and staff will provide final approval of the bird flight diverter to be installed. Staff recommends that the Swan Flight Diverter be given careful consideration when making a decision about which diverter is to be installed.

**Verification:** No less than 7 days prior to energizing the new RCEC transmission line, the project owner will provide photographic verification to the CEC CPM that bird flight diverters have been installed to manufacturer's specifications. A discussion of how the bird flight diverters will be maintained during the life of the project will be included in the project's BRMIMP.

### ✓ **Sensitive Species Management Plan**

**BIO-14** The project owner shall provide a final, approved sensitive species management plan.

**Protocol:** The sensitive species management plan shall:

- 1) Be approved by the USFWS, DFG, EBRPD and staff;
- 2) Identify how landscaping will deter perching, nesting/roosting of raptors and corvids;
- 3) Identify how the effectiveness of perch deterrents will be monitored and evaluated ;
- 4) Identify all measures to be implemented should monitoring indicate that perch deterrents are ineffective.

**Verification:** No later than 30 days prior to the start of any site mobilization activities, the project owner will provide to the CEC CPM a final approved version of the Sensitive Species Management Plan. The final Sensitive Species Management Plan shall be included in the RCEC BRMIMP.

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## CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET  
SACRAMENTO, CA 95814-5512

	AFS-FW	AFS-FA	AFS-PC	AFS-ES		
	IMPL	HC	ESD	EC	CP	ADMIN
<i>Gary J. A.</i> <i>ESD C&amp;A BD.</i> <i>Cecilia</i>						
July 25, 2001						



Mr. James R. Leahy  
 Calpine/Bethel Joint Development  
 6700 Koll Center Parkway, Suite 200  
 Pleasanton, California 94566

**DOCKET**  
 01-AFC-7

DATE JUL 25 2001

RECD. JUL 25 2001

Dear Mr. Leahy:

### RUSSELL CITY ENERGY CENTER (01-AFC-7) STAFF DATA REQUESTS

Pursuant to Title 20, California Code of Regulations, section 1716, the California Energy Commission requests the information specified in the enclosed data requests. The information requested is necessary to: 1) more fully understand the project, 2) assess whether the facility will be constructed and operated in compliance with applicable regulations, 3) assess whether the project will result in significant environmental impacts, 4) assess whether the facilities will be constructed and operated in a safe, efficient and reliable manner, and 5) assess potential mitigation measures, if necessary.

These data requests (#1- 106) address the areas of air quality, biological resources, cultural resources, land use, noise, project description, reliability, socioeconomics, soil and water resources, traffic and transportation, and visual resources. Written responses to the enclosed data requests are due to the Energy Commission staff on or before August 24, 2001, or on such date as may be mutually agreed.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, please send a written notice to both Commissioner William Keese, Presiding Member of the Committee for the Russell City Energy Center proceeding, and to me, within 10 days of receipt of this notice. The notification must contain the reasons for not providing the information, the need for additional time and the grounds for any objections (see Title 20, California Code of Regulations section 1716 (f)). If you have any questions regarding the enclosed data requests, please call me at (916) 654-4176.

Sincerely,

Kae C. Lewis  
 Energy Facility Siting Project Manager

Enclosure

cc: Keith Lichten, SF Bay Regional Water Quality Control Board  
 Waymen Lee, Bay Area Air Quality Management District  
 Alex Ameri, City of Hayward

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Air Quality  
**Author:** Gabriel D. Behymer

**BACKGROUND**

Best Available Control Technology (BACT) Analysis

In AFC Appendix 8.1F "Evaluation of Best Available Control Technology" the applicant proposes a short term average NO<sub>x</sub> BACT of 2.5 ppm and a CO BACT of 6.0 ppm. However, the USEPA, in a recent letter to the San Luis Obispo County Air Pollution Control District concerning the Morro Bay project (*attached*), has commented that the BACT limit for gas turbines should be set at 2 ppm for NO<sub>x</sub> (1-hour average corrected to 15% O<sub>2</sub>) with no greater than 5 ppm NH<sub>3</sub> slip. In addition, EPA indicated that the BACT for CO should be 2 ppm (3-hour average).

Appendix 8.1F presents a discussion of BACT in the Bay Area Air Quality Management District (District), however the applicant did not address the possibility of using a SCONOX system in the facility. Staff believes a BACT analysis including such a possibility will be needed.

**DATA REQUEST**

1. Please provide a discussion of how the Russell City Energy Center (RCEC) will address the revised BACT levels recommended by USEPA.
2. Please provide a BACT analysis that includes a discussion of SCONOX technology comparable to the "Top Down Analysis for BACT for NO<sub>x</sub>" prepared for the Metcalf Energy Center project (dated August 3, 2000).

**BACKGROUND**

Startup and Shutdown Emissions

The text on page 8.1-23 specifies that "startup *and shutdown* emissions are shown in Table 8.1-18," however, that table only contains information regarding startup emissions. In addition, no vendor data or other evidence has been provided regarding startup and shutdown emissions estimates.

**DATA REQUEST**

3. Please provide either an updated Table 8.1-18 or an explanation for the discrepancy.
4. Please provide vendor documentation and details of all assumptions used regarding startup and shutdown emissions.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**BACKGROUND**

Emissions Reduction Credits (ERC)

AFC section 8.1.6.3 "Emissions Offsetting" seems to contain some inconsistencies. Please provide clarification of the following issues.

**DATA REQUEST**

5. District Rule 2-2-302 indicates an emissions offset ratio of 1.15:1.0 for precursor organic compounds (POC) and the text on page 8.1-46 of the Russell City Application For Certification (AFC) agrees with this offset ratio. However, Table 8.1-35 indicates an offset ratio of 1:1 was used for POC. Please resolve this discrepancy and provide the details of the exact ERC numbers and ERC allocation proposed for offsetting the RCEC.
6. AFC section 8.1.6.3 (pg. 8.1-46) mentions District Rule 2-2-302.1 and indicates that the rule allows NOx ERC to be used to offset increased emissions of POC. This District Rule was deleted on May 17, 2000. Please indicate if the deletion of this rule will impact the proposed ERC allocation, and if so please provide details of all changes.

**BACKGROUND**

Architectural Treatment

Appendix 8.1B, Table 8.1B-1A lists the onsite structure coordinates for use in the air quality modeling of the emissions impacts from the RCEC. However, the applicant has proposed to include an "architectural treatment" surrounding the stacks & heat recovery steam generator (HRSG) for visual impact mitigation and it is not clear if this structure was taken into account in the modeling.

**DATA REQUEST**

7. Please provide a detailed analysis of the impacts of the "architectural treatment" on the air quality modeling. If the "architectural treatment" has not been included in the existing air quality modeling and if it is determined to have a significant effect on the modeling, please submit revised modeling results.
8. Please provide a detailed analysis of the impacts of the "architectural treatment" on the modeled fumigation impacts. If the "architectural treatment" has not been included in the existing fumigation modeling and if the "architectural treatment" is determined to have a significant effect on the modeled fumigation impacts, please submit revised modeling results.

**BACKGROUND**

Duct Burners

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

AFC Section 8.1.5.1 (pg. 8.1-20) specifies that both HRSGs will be equipped with a 200 MMBtu/hr duct burner, however, no supporting manufacturer or vendor documentation concerning design specifications or emissions estimates has been included.

**DATA REQUEST**

9. Please provide documentation of the manufacturer name, vendor emissions estimates and design specifications for the proposed duct burners.

**BACKGROUND**

Emergency Natural Gas Generator

AFC Section 8.1.5.1 (pg. 8.1-20) specifies that the RCEC design includes a 600 kW natural gas emergency generator set, however, no supporting manufacturer or vendor documentation has been included.

**DATA REQUEST**

10. Please provide documentation of the manufacturer, vendor emissions estimates and design specifications for the proposed 600 kW natural gas fired emergency generator.

**BACKGROUND**

Diesel Fire Pump

Table 8.1-16 presents the emission rates from the fire pump engine "per vendor guarantee" however, no manufacturer or vendor information has been provided to substantiate these figures. In addition, the District may have rules, regulations and/or policies that govern diesel engines of this type and yet were not discussed in the AFC.

**DATA REQUEST**

11. Please provide documentation of the manufacturer, model number and vendor emissions specifications for the proposed 300 bhp diesel fire pump engine.
12. Please provide a discussion of how RCEC will insure that the specified diesel fire pump engine will comply with all District rules, regulations and policies.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

June 19, 2001

Mr. David W. Dixon  
Engineering Division Supervisor  
San Luis Obispo Air Pollution Control District  
3433 Roberto Court  
San Luis Obispo, CA 93401

Re: Preliminary Determination of Compliance for Duke Energy Morro Bay LLC  
CEC Docket Number 00-AFC-12

Dear Mr. Dixon:

I am writing to you concerning the Preliminary Determination of Compliance ("PDOC") for the proposed Duke Energy Morro Bay LLC project. We appreciate the opportunity to comment on the PDOC for this project. We have two comments concerning Best Available Control Technology ("BACT"):

1. BACT for NO<sub>x</sub> Emissions

Although we have not seen the San Luis Obispo Air Pollution Control District ("District") top-down BACT analysis for this project, we believe the BACT limit for NO<sub>x</sub> should be set at 2.0 ppmvd on a 1-hour rolling average. The San Joaquin Valley Unified Air Pollution Control District recently determined NO<sub>x</sub> BACT to be 2 ppmvd @ 15% O<sub>2</sub> averaged over 1-hour for a similar project, the Midway Sunset Cogeneration Company 500 MW natural gas-fired combined-cycle power plant project nears Fellows, California (December 14, 2000, Notice of Final Determination of Compliance, CEC Docket No. 99-AFC-9). We also expect that 5 ppmvd ammonia slip can be achieved at the 2.0 ppmvd NO<sub>x</sub> level.

2. BACT for CO Emissions

EPA believes that presumptive BACT for CO for this project, unless the data from the BACT analysis show otherwise, to be 2.0 ppmvd on a 3-hour rolling average, not the 6.0 ppmvd 3-hour rolling average that is specified in the PDOC.

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**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Biological Resources  
**Author:** Stuart Itoga, Rick York

**BACKGROUND**

In order to analyze the potential significant impacts of the proposed RCEC (Russell City Energy Center) to biological resources in the project area, CEC staff is requesting additional information as listed below.

**DATA REQUEST**

13. Please provide sensitive plant survey results for Point Reyes bird's-beak (*Cordylanthus maritimus palustris*), Hispid bird's-beak (*Cordylanthus mollis hispidus*), Delta tule pea (*Lathyrus jepsonii*), California seablite (*Suaeda californica*) and any other sensitive plant species known to occur in the project region. If botanical surveys have not been completed, provide an estimated time for completion.
14. Staff experienced difficulty interpreting the map provided in the AFC (Figure 8.2.3). Please provide a map at a scale of 1"/6000' which clearly identifies the biological communities, and their locations, within the RCEC project area. Improvements to the legend and its corresponding symbols are needed.
15. Please provide a discussion of how the proposed project will alter hydrologic inputs, specifically, storm water runoff, to areas surrounding the proposed RCEC project area, including the storm water retention pond, the HARD Marsh and the salt marsh harvest mouse preserve.

**BACKGROUND**

Radio transmission towers currently occupy the proposed project site; however, much of it is open space. Seasonal wetlands have been identified, and there is a mixture of native and nonnative vegetation on site. The proposed project site is located adjacent to an area of upland habitat. Beyond the uplands are a storm water retention pond and brackish marsh. A variety of wildlife species have been observed in the storm water retention pond and brackish marsh. Additionally, vegetation in these habitats includes pickleweed, a habitat requirement for the endangered (federally and state-listed) salt marsh harvest mouse. Wildlife move between habitats in managing their daily energy budgets and it is likely that some wildlife species are utilizing the upland habitat and proposed project site for activities such as movement, feeding, nesting and as refugias.

**DATA REQUEST**

16. Please quantify ambient noise levels associated with the RCEC during normal, as well as peak, levels of operation. Provide a discussion of potential

**Russell City Energy Center Project  
Data Requests  
(01-AFC-7)**

significant impacts to wildlife on the adjacent upland habitat from elevated noise levels associated with construction and operation of the RCEC.

17. Please provide a list of mitigation measures the applicant will employ to avoid or reduce impacts to biological resources caused by construction and operation of the RCEC. Include the compensation ratio that will be used for calculation of mitigation acreage.
18. Please provide updated information on the status of informal consultations with the U.S. Fish and Wildlife Service. Indicate if a letter of concurrence will be issued or a Section 7 consultation will be initiated. If a Section 7 consultation is needed, indicate the agency that will initiate consultation.
19. Please provide updated information on the status of the U.S. Army Corps of Engineers Section 404 permit.
20. Please indicate steps taken to obtain applicable permits from the California Department of Fish and Game (DFG), including a DFG incidental take permit. If an Incidental Take Permit is not required, provide any supporting information.

**BACKGROUND**

Because of the sensitive biological resources found in the project region, the applicant will need to develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP will address all measures the applicant will employ to mitigate impacts to biological resources in the project region during construction and operation of the project. Upon request, Energy Commission staff will provide a current example of a BRMIMP.

**DATA REQUEST**

21. Please provide an outline of what will be included in the draft BRMIMP for the RCEC. Contents of the BRMIMP should include, but not be limited to: impact avoidance measures (including erosion control measures), compensation strategies, appointment of a Designated Biologist (and associated duties), pre-construction/construction monitoring and any other biological measures to be implemented for any applicable local, state and federal permits.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Cultural Resources  
**Author:** Roger Mason

**BACKGROUND**

It cannot be determined from the AFC and Data Adequacy Responses whether local historical societies and local jurisdictions (cities and counties) were contacted to determine if any historical resources in or near the project area are listed in local historical inventories or registers. Such local inventories are often not reflected in information obtained from a records search at the appropriate Archaeological Information Center.

**DATA REQUEST**

22. Please provide a list of any historical resources listed on local inventories or registers within one half mile of the power plant site and all linear routes that are part of the project. If local historical societies and archaeological societies were not contacted, please contact them and provide copies of any inquiries and responses from such societies. If contact is made through interviews rather than by letter, please provide a written description of contact methods used and information obtained.
23. Please contact The Shoreline Interpretive Center to obtain any information they may be able to provide regarding cultural resources in the vicinity of the project and project linears.

**BACKGROUND**

In order to document that all cultural resources studies necessary for the CEQA process have been completed, staff needs to have cultural resources technical reports on file.

**DATA REQUEST**

24. Please provide copies of the cultural resources survey report or reports (technical reports) that document the field surveys conducted by the applicant's consultant for this project. These surveys include those summarized in the AFC and the Supplement to the AFC. These reports should be prepared following the portions of the SHPO's guidelines for "Archaeological Resource Management Reports" that pertain to survey reports. The report should contain a copy of relevant portions of USGS quads at 1:24,000 scale showing the project site and all linear routes and showing what areas were surveyed. Please provide completed DPR 523 forms in an appendix to the report for cultural resources identified as a result of the survey. The report should also have an appendix that contains a copy of the letter and bibliography from the Archaeological Information Center received as part of the records search. Another appendix should provide resumes for cultural resources specialists that contributed to the report.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**BACKGROUND**

Information regarding permits and easements is necessary for staff to ensure compliance with federal, state and local LORS. At times permits or easements granted under state law include requirements regarding cultural resources. If there are no requirements concerning cultural resources included in an easement or permit, staff will need to know that to ensure compliance with law.

**DATA REQUEST**

25. Please provide a schedule for acquiring any permits or easements required by state law.
26. Please identify any federal permits required for this project that are defined as a federal undertaking under 36 CFR Part 800, Section 106 of the National Historic Preservation Act.

**BACKGROUND**

The Supplement to the AFC, submitted June 19, 01, included a discussion of the built environment surrounding the RCEC project site. The discussion compared buildings and structures observed during a drive-by-architectural reconnaissance to buildings and structures on several historic maps. Page 8.3-10 identifies two transmission lines that date prior to the 1920's and prior to 1939.

**DATA REQUEST**

27. Please discuss features or objects that may have been identified during a drive-by-architectural reconnaissance that would not necessarily appear on an historic map. Examples of possible features are fences or irrigation ditches.
28. Please provide a discussion of the power poles that will be replaced and the transmission lines that will be affected by the project and provide a context statement authored by an architectural historian or a specialist in industrial or architectural history that addresses the history of the feature. Please also record the feature(s) on a DPR 523. (Use of an appropriate specialist is essential to provide the level of information necessary for this analysis).
29. Please have an architectural historian or a specialist in industrial or architectural history provide an evaluation of the transmission line's eligibility to the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). (Use of an appropriate specialist is essential to provide the level of information necessary for this analysis).
30. Please provide a resume for the person(s) authoring the context statement and evaluating the transmission line for eligibility to the NRHP or the CRHR.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Land Use  
**Author:** Jon Davidson

**BACKGROUND**

In order to assess potential land use impacts, it is necessary to have a clear understanding of existing land uses at the project site and in the surrounding area.

**DATA REQUEST**

31. Section 1.1 of the AFC states that approximately 11 acres of the 14.7-acre RCEC site is occupied by the transmitter facilities of Radio Station KFAX.
  - a. Please describe these facilities.
  - b. Describe how the remainder of the site is currently utilized.
32. While Section 8.6.1.2 of the AFC describes existing land uses in the area, the only adjacent uses specifically identified are the Water Pollution Control Facility (north) and a multi-company trucking terminal (west). Please identify the other adjacent land uses (southwest, south, southwest, east, northeast, and northwest).
33. Section 8.6.1.3 of the AFC indicates that the Hayward Area Shoreline Plan as an applicable land use plan. However, in Section 8.6.5 (Applicable Laws, Ordinances, Regulations, and Standards) there is no discussion of the Hayward Area Shoreline Plan.
  - a. Describe the Hayward Area Shoreline Plan.
  - b. Discuss the consistency of the proposed project with the policies and provisions of the plan.

**BACKGROUND**

We would like to fully understand all aspects of the proposed project affecting the use of land, including required easements or other agreements affecting private property.

**DATA REQUEST**

34. The AFC (Section 5.1) indicates that the proposed route for the natural gas supply line follows an existing utility easement across private property (Berkeley Farms). Please describe this easement. Discuss whether the supply line will be located within this existing easement, or whether a new or expanded easement is required.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Noise  
**Author:** Brewster Birdsall

**BACKGROUND**

The CEC typically assesses a 5 dB noise level increase threshold of potential significance by comparison of the steady state noise level due to the power plant to the average (or typical)  $L_{90}$  values obtained during nighttime hours, as noted by the applicant. The applicant has summarized the average nighttime  $L_{90}$  values collected during the monitoring periods in the text and Table 8.7-5 of the AFC. However, the hourly noise level data were not provided.

**DATA REQUEST**

35. Please provide the hourly  $L_{eq}$ ,  $L_{50}$ , and  $L_{90}$  values for noise measurement sites 1 through 5 in tabular format. Note any time periods where it is believed that extraneous noise sources affected the noise level data.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Project Description  
**Authors:** Kae Lewis

**BACKGROUND**

There are three construction laydown location options mentioned on page 2-27 (Project Description) of the AFC. One of these sites appears to be adjacent to the RCEC site and would be expected to have environmental impacts similar to the project site. The other two sites are not adjacent to the project site and may have environmental impacts which are different from those identified to the RCEC.

**DATA REQUEST**

36. Please identify which option for a construction laydown location will be chosen and provide an environmental and mitigation analysis of any impacts which may be associated with that site (if different from the project site).

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Reliability  
**Authors:** Shahab Khoshmashrab and Steve Baker

**BACKGROUND**

As designated in the AFC (RCEC 2001a, Table 2-2, Major equipment redundancy), the applicant proposes to install one – 100 percent HRSG feed-water pump per HRSG and maintain one – 100 percent HRSG feed-water pump in the plant warehouse. To fully achieve the applicant's estimate of plant availability and to provide reliability in line with common industry practice, RCEC could install the third HRSG feedwater pump.

**DATA REQUEST**

37. Please indicate how the RCEC will provide the estimated level of availability and match the level of reliability common in the industry without installing this third pump.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Socioeconomics  
**Author:** Dan Gorfain/Amanda Stennick

**BACKGROUND**

In the AFC the Applicant states that there may be some relocation of construction workers that may temporarily affect hotel/motel conditions (page 8.10-8). In order to better assess the potential impact on all sources of available housing, please provide the following:

**DATA REQUEST**

38. Data on the availability of mobile home and RV park spaces within Alameda County; the number of current vacant spaces; and a map showing the location of mobile home parks and RV sites in Alameda County.

**BACKGROUND**

In order to better assess the economic impacts and benefits of the project, please provide the following information:

**DATA REQUEST**

39. Will the applicant pay an annual franchise fee to the City of Hayward? If so, what will this fee be and will it be tied over time to an inflation index such as the Consumer Price Index? Are there any financial agreements between the City and the applicant regarding payment of fees or payment for service, other than property and other normal taxes?
40. Will the applicant reimburse the City for the actual cost of security guards and security services, traffic diversion during construction, and any other emergency services associated with the project?
41. Is the applicant responsible for providing portable toilets during construction?
42. Will the applicant erect and maintain a security fence around the construction site?

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**Technical Area:** Soil and Water Resources  
**Authors:** Joe Crea, John Scroggs, Jim Henneforth & John Kessler

## **BACKGROUND**

Construction and operation of the Russell City Energy Center (RCEC) may induce water and wind erosion at the power plant site. Stormwater runoff may also contribute to erosion and sedimentation as well as transport of pollutants off-site. The AFC describes existing and proposed stormwater management as follows: Currently, stormwater drains from a small portion of the RCEC Site near the West boundary onto adjacent wetlands, and to a greater extent, drains South for the balance of the site into a Flood Control Channel along the Southern boundary, which flows into marsh and wetland areas at the margin with San Francisco Bay. Once the Advanced Wastewater Treatment Plant (AWT) is constructed, site stormwater will be collected and pumped to the headworks of the City of Hayward's Water Pollution Control Facility (WPCF). Stormwater from the RCEC would be managed in two systems, separating stormwater from Process vs. Non-Process Areas. For Process Areas, stormwater would be collected and passed through an Oil/Water Separator before being contained in a Holding Tank. Stormwater contained in the Holding Tank would then be tested, and if of adequate quality, would be pumped to the headworks of the City of Hayward's WPCF. If stormwater contained in the Holding Tank tested poorly, it would be treated before being pumped to City of Hayward's WPCF. Stormwater originating from Non-Process Areas, such as parking lots and roof-top drains, would be collected in a Stormwater Impoundment Pond, tested for adequate quality, and then released into a Flood Control Channel along the South boundary.

The June 19, 2001 Supplemental Information provides a Drainage Plan and supporting calculations for stormwater management which appears to exclude BMP's identified in the AFC, such as the Holding Tank for retaining stormwater drainage from RCEC Process Areas.

A Stormwater Pollution Prevention Plan (SWPPP) will be necessary, which addresses how drainage into the Holding Tank and Stormwater Impoundment will be monitored for contaminants to determine adequate quality of stormwater before being released. In addition, an Erosion Control and Sedimentation Plan is needed to address construction activities at the AWT and RCEC, and any associated linear or other facilities, such as transmission lines, pipelines, lay-down areas, and staging/storage areas. Also, relatively shallow depths to groundwater may be encountered, and as identified in the Phase I ESA; therefore, the potential for soil and/or groundwater contamination may exist and potentially encountered during construction.

## **DATA REQUEST**

43. Please provide a conceptual Erosion and Sedimentation Control Plan that identifies all measures that will be implemented at various locations of the project during construction and operation of the proposed RCEC Project. The conceptual

**Russell City Energy Center  
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(01-AFC-7)**

Erosion and Sedimentation Control Plan shall identify all permanent and temporary measures in written form and depicted on a construction drawing(s) of appropriate scale. The purpose of the plan is to minimize the area disturbed, to protect disturbed and sensitive areas, to retain sediment on-site and to minimize off-site effects of stormwater runoff. The elements of the plan shall include specific best management measures to be employed to control stormwater runoff during construction and operation at identified locations. In addition, any Best Management Practices (BMP's) necessary to address Nationwide Permits, as required, should be identified. The plan should also identify maintenance and monitoring efforts for all erosion control measures.

44. Include in the Erosion and Sedimentation Control Plan a discussion and description of how this plan will address encountering non-contaminated groundwater during excavations, as well as any contaminated soil or groundwater that may be excavated or encountered during construction. Specifically address how stormwater coming into contact with any contaminated materials will be collected, treated, and discharged.
45. Please provide a draft Storm Water Pollution Prevention Plan (SWPPP) consistent with the requirements for both General Stormwater Construction Activity and General Industrial Stormwater Activity Permits for the RCEC property that includes site modifications necessary to accommodate the power plant.
46. Please clarify if current plans for managing stormwater during plant operations include routing stormwater from Process Areas into a separate Holding Tank, allowing retention and tests for adequate quality, before discharge into the headworks of the Hayward Water Pollution Control Facility (WPCF). If not, please address what BMP's are planned in lieu of stormwater retention and monitoring to assure that no hazardous material pollutants are discharged into the Hayward WPCF.
47. Please explain how storm water management during plant operations from Non-Process Areas will accommodate monitoring of quality before release into the flood control channel along the southern property boundary, if the two storm water basins are only serving to detain, rather than retain storm water. If retention is not part of the current plans, please address what BMP's are planned in lieu of storm water retention and monitoring to assure that no hazardous material pollutants are discharged into the flood control channel, and under more intense rainfall events, could potentially discharge into sensitive wetlands.
48. In reference to the manual "Hydrology and Hydraulics Criteria Summary for Western Alameda County" issued by Alameda County Public Works Agency, please consider if any tidal backwater effects from San Francisco Bay or flood inundation effects in reference to the FEMA 100-year storm should be taken into account in the analysis for designing storm water facilities.
49. In reference to Supplement 1, Sheets 4 and 7 of the Preliminary Storm water Management Basin Sizing Calculations, please explain in the calculation of Time

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of Concentration for Pre and Post-Development Runoff, why a value of "P" was used applicable to a 2-Year, 24-Hour Depth rather than a 15-Year Recurrence event.

50. Please provide evidence of consultation with City of Hayward, Alameda County and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) regarding application of the appropriate design criteria, and plans for implementing appropriate BMP's as specified in a Draft SWPPP.
51. Please include in the Draft SWPPP a component for monitoring stormwater quality, identifying the parameters and frequency of monitoring. In addition, please identify procedures to be followed in the event that stormwater monitored in the stormwater management basins exceeds allowable discharge limits.

**BACKGROUND**

In reference to the June 19, 2001 Supplemental Information, Figure 8.15(s)-4, FEMA Flood Zones, the 100-year inundation limits are shown to include area within the southwest corner of the site where the AWT is to be located. In addition, Response 9 on Page S-35 indicates that the property is currently protected by berms at the southern end of the property, and that ground level will be increased by 5 feet with fill material before construction in order to protect from 100-year flood events.

**DATAREQUEST**

52. Please identify the 100-year flood elevation and discuss the elevation of existing and proposed berms and other proposed measures, including specifying the extent of raising critical project facilities, equipment and hazardous material storage/containment areas, in order to accomplish protection from the 100-year flood elevation. Please illustrate these plans on an enhanced plan map and profile, showing proposed facilities and protection measures, and the pre and post-project inundation limits.
53. Please provide evidence of consultation with, and acceptance of plans by City of Hayward, Alameda County and FEMA.

**BACKGROUND**

In reference to Figure 2.2-4 in the AFC, Water Balance Diagram, several revisions appear necessary to correspond with current project plans.

**DATA REQUEST**

54. Please remove the Sewage Treatment Plant and redirect this stream to the Hayward WPCF if plans are as described in the AFC, or clarify if this is not the case.

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55. Please redirect the Building/Roof Drains (non-process area) stormwater stream to the Stormwater Management Basin, rather than the Hayward WPCF if plans are as described in the AFC, or clarify if this is not the case.
56. Please indicate current plans for stormwater management, including the process for streams that are accepted by City of Hayward as influent to their WPCF.
57. Please indicate supply of Firewater from Hayward's Potable Supply, rather than Reclaimed Water if plans are as described in the AFC, or clarify if this is not the case.
58. Please provide any other updates to the Water Balance Diagram, add a legend indicating that all flow units are in gallons per minute (gpm), and provide a revised diagram when completed.

**BACKGROUND**

In reference to Section 2.2.12, Fire Protection, the section states that the backup pump will consist of a diesel driven pump. A diesel engine requires storage and containment of diesel fuel, and may not be as reliable as utilizing the primary electric pumps with a standby generator supplied with natural gas or propane, and automatic transfer switch.

59. Please evaluate design of the backup fire pump system considering use of a standby generator and automatic transfer switch. The generator could be fueled with either natural gas or propane.

**BACKGROUND**

Data is either missing or duplicated in two areas of AFC Section 8.15. In reference to Page 8.15-10, Table 8.15-3 and Page 8.15.16, Table 8.15-3, both tables have the same data. The table on Page 8.15-10 should be representative of water quality data for storm water runoff. On Page 8.15-14, Section 8.15.2.2 – Water Supply Impacts, the fifth paragraph refers to water quality constituents of the Hayward Water Supply being listed in Table 8.15-3. However, Table 8.15-3 characterizes quality of cooling tower blowdown.

**DATA REQUEST**

60. Please provide the appropriate data for the table on Page 8.15-10 (AFC) to represent water quality of storm water runoff.
61. Please provide the appropriate data characterizing the City of Hayward Water Supply as referred to on Page 8.15-14 of the AFC.

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**BACKGROUND**

In reference to Supplemental Information Figure 8.15(s)-3a and AFC Figure 2.3-2, Water Supply Pipeline Routes, water required for domestic and fire fighting uses will be provided by the City of Hayward. A new connection will be made to the existing 12-inch potable water line that is located on Enterprise Avenue.

**DATA REQUEST**

62. Please show locations of the needed backflow-devices on the piping plans and specify preliminary makes and models of devices that would be acceptable.

**BACKGROUND**

The proposed Advanced Wastewater Treatment of secondary effluent includes plans to use microfiltration and reverse osmosis processes. Microfiltration is typically used to treat relatively low turbidity and low suspended solid water supplies to meet drinking water standards. In addition, a continuous sodium hypochlorite (chlorine) feed system is proposed ahead of the microfiltration system for bio-fouling control. The leading manufacturer of microfiltration equipment uses hollow fiber membranes manufactured from polypropylene material, which is subject to degradation when exposed to oxidants such as chlorine.

In reference to Page 2-34 of the AFC, it is suggested that two standby Continuous Microfiltration (CMF) units are included in the AWT design to provide redundancy in the event of malfunction and during routine cleanings. Under peak water supply conditions, a demand flow rate of 3,660 gpm is projected. According to Table 2.3 -1, a total of nine units comprised of 90 modules/unit are proposed with a total 24-hour peak capacity of: [(4.43 gpm/module) (90 modules/CMF unit) (9 CMF units) = 3,588 gpm]. This calculation suggests that with all 9 CMF's in operation, 24-hours per day that the microfiltration design capacity is not adequate to meet peak water supply conditions, nor supply any redundancy during malfunction or cleaning.

**DATA REQUEST**

63. Please provide written confirmation from a microfiltration process manufacturer, who has regularly furnished and installed units of comparable size, that the microfiltration process as proposed is an appropriate technology for treatment of secondary effluent compatible with water quality characteristics of supply from the Hayward WPCF and the USD/EBDA.
64. Please provide an explanation on how the proposed microfiltration membrane will not be damaged by exposure to chlorine.

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65. Please evaluate the proposed peak day water demands with respect to capacity of filtration provided by nine CMF's. Evaluate the need to provide additional CMF units to provide adequate redundancy.

**BACKGROUND**

In reference to Supplemental Information Table 7(s)-7 on Page S-33, the data is intended to show AWT waste stream quality using USD/EBDA secondary effluent. However, the data is labeled in reference to Hayward WPCF effluent.

**DATA REQUEST**

66. Please confirm the data in Table 7(s)-7 applies to USD/EDBA secondary effluent, or if not, provide a table with applicable data.

**BACKGROUND**

Secondary effluent conveyed by the USD/EDBA Force Main is proposed as a backup source of water for RCEC in the event that there is an upset at the Hayward WPCF which causes deterioration of water quality.

**DATA REQUEST**

67. Please describe how the Hayward WPCF effluent will be monitored and measured for adequacy of water quality for the proposed RCEC use.
68. Generally describe the hydraulic controls, including valves, pumps and operating logic that will be used to transfer from primary to backup water supply. Will transfer be automatically actuated or controlled based on water quality results and set points, or will transfer be manually controlled?

**BACKGROUND**

In reference to AFC Section 7 (Pages 7-1, 7-2 and 7-8), each waste stream "will be monitored prior to discharge to the existing sewer to assure that it meets appropriate discharge limits". Reject streams from the AWT, cooling tower blowdown and plant drainage are proposed with separate monitoring points to assure they meet discharge limits.

**DATA REQUEST**

69. Please identify the waste stream constituents to be monitored (e.g. copper, BOD, TSS?). Is monitoring proposed by continuous sampling or with grab samples?
70. Please describe the control system (or procedure) that would be initiated if a waste stream does not meet discharge limits.

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71. If a waste stream does not meet limits, is an alarm automatically activated? Does a plant shutdown occur? Are wastes discharged to a holding facility under these conditions?

**BACKGROUND**

In reference to AFC Section 8.14 – Waste Management, a Phase I ESA was conducted for the RCEC site, and revealed recognized environmental conditions in contamination to soil and groundwater. The contamination appears to have occurred during historical uses of the property by a metal finishing company as a result of its processes and use of underground storage tanks. Although the metal finishing company, Runnels Industries, is still currently in operation, it appears that development of the RCEC will utilize the land currently occupied by Runnels Industries, which is located on the east end of the proposed RCEC site near Whitesell Drive. Results of soil sampling conducted by Runnels Industries in 1996 indicate the presence of chromium, lead and zinc in soil and up to four feet of potentially contaminated fill from dumping of sand blasting waste. Results of groundwater monitoring revealed groundwater contamination from VOCs and petroleum hydrocarbon, with the highest concentrations existing near the center of the Runnels parcel, and lower concentrations detected along the east property boundary and down-gradient near the west property boundary. Site closure for the materially recognized conditions has not been obtained by Runnels Industries.

**DATA REQUEST**

72. Please provide an analysis of the potential for the construction or operation of the RCEC to impact existing soil or groundwater contamination, and the identification, containment and treatment measures that would be employed in order to mitigate the contamination as may be required prior to, during and following construction of the RCEC. The analysis should include the following:
- a) Documentation of consultation with Alameda County Health Care Services Agency – Environmental Protection Division and Hayward Fire Department regarding the planned disturbance to soils associated with the RCEC development and the recommendations or requirements of these agencies for any additional soil and groundwater sampling, pre-construction treatment/remediation, testing during excavation activities, handling/treatment and disposal techniques if contaminated soil or groundwater is encountered, and post-construction monitoring. If possible, please identify the activities and schedule necessary to obtain site closure of the recognized environmental conditions.
  - b) Clarification if the Applicant is assuming the environmental liability for any ongoing remediation and monitoring for contamination to soil and groundwater that may be required following acquisition of the Runnels Industries and KFOX parcels.

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- c) Submittal of Draft Sediment Control and Stormwater Pollution Prevention Plans which incorporate measures identified in consultation with Alameda County and Hayward Fire Department to prevent the spread of soil and groundwater contamination, and prevent degradation of surface water quality.

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**DATA REQUEST**

77. Please provide observed data regarding construction employee arrival and departure patterns for at least three comparable projects, preferably in the seven-county San Francisco Bay Area.

**BACKGROUND**

In order to identify whether or not the AFC (AFC page 8.12-2 , Table 8.12-2) results in a significant impact to any of the study intersections, City of Hayward thresholds for acceptable level of service conditions are required.

**DATA REQUEST**

78. Please provide City of Hayward level of service thresholds and significance criteria.

**BACKGROUND**

On AFC page 8.12-18 it states "Though actual counts were not available for one of the new intersections, State Route 92 at Clawiter, this intersection is at LOS "F", and the project would not make it significantly worse."

**DATA REQUEST**

79. Please provide technical data supporting this conclusion, including number of construction phase trips and operation phase trips.

**BACKGROUND**

Table 8.12-9 presents "Construction and operation phase LOS for selected roadway intersections".

**DATA REQUEST**

80. Please provide reasoning why only certain intersections and peak hours are presented in the AFC.

**BACKGROUND**

Appendix 8.12-A only provides Existing AM and PM peak hour intersection level of service calculations.

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**DATA REQUEST**

81. Please provide detailed level of service calculation for all study intersections included in the AFC, including Existing, Construction Phase and Operation Phase AM and PM peak hour conditions.

**BACKGROUND**

Table 8.12-7 presents "Construction Phase trip generation, daily traffic and peak hour".

**DATA REQUEST**

82. Please provide an operation phase trip generation, daily traffic and peak hour .

**BACKGROUND**

To assess the potential for impact associated with accidental hazardous materials releases during transportation to the facility, it necessary to know the specific preferred transportation route(s) and the land uses along that route(s). The transport of hazardous materials to the facility during operations is addressed in the section on Traffic and Transportation. Information on the number of hazardous material deliveries is provided, as are several different routes from a major highway to the facility.

**DATA REQUEST**

83. Please provide a more detailed map indicating the preferred hazardous materials transportation route from either Interstate 880 or State Route 92 to the facility entrance gate and include a brief description of the land uses along the route(s) (commercial, industrial, residential, parks, schools, open space, etc.).

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**Technical Area:** Visual Resources  
**Author:** Eric Knight and William Walters

**BACKGROUND**

Staff will need to include in the Staff Assessment the Applicant's figures presented in Chapter 1.0 Executive Summary, Chapter 2.0 Project Description, Section 8.13 Visual Resources, and those provided in response to these data requests.

**DATA REQUEST**

84. Please provide electronic files of Figure 1-1 from Chapter 1.0 Executive Summary, and the following Chapter 2.0 Project Description figures: 2.2-1, 2.3-1, 2.2-2a, and 2.2-2b.
85. Please provide electronic files of all figures presented in Section 8.13 Visual Resources and in response to these data requests.

**BACKGROUND**

Seven key observation points (KOPs) were established in order to evaluate both the visual setting and the potential for project-induced visual impacts. Photographs were obtained at each KOP and presented along with visual simulations of the proposed project. Section 8.13.2.1 Analysis Procedure (page 8.13-10) states that photo simulations were prepared "providing the viewer with a clear image of the location, scale, and visual appearance of the proposed project." However, based on a field reconnaissance, all of the images (existing view photographs as well as simulations) are presented at substantially less than life-size scale. Most images are approximately 50% (or less) of life-size scale when held at a standard reading/viewing distance of 18 inches. The presentation of images at such a reduced scale does not accurately represent the views that would be experienced at the various KOPs because the images substantially understate the prominence of visible landscape features as well as potential visual impacts.

**DATA REQUEST**

86. Please re-scale all existing view<sup>1</sup> and simulation images to achieve life-size scale. If re-scaling results in substantial degradation of the image, please provide new setting and simulation images at life-size scale. After obtaining appropriately scaled images, please provide high quality 11"x17" color photocopies of the existing views and simulations.

**BACKGROUND**

As discussed under Assessment of Visual Effects (Section 8.13.2.4) and seen in Figure 8.13-4b, the project would substantially block the view of Mount Diablo from the

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<sup>1</sup> It is not necessary to re-scale the visual character photographs (Figures 8.13-2a and 8.13-2b).

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Hayward Shoreline Interpretive Center (KOP 2). This is a potentially significant adverse visual impact under the criterion set forth in Appendix G of the CEQA Guidelines that reads: "Would the project have a substantial adverse effect on a scenic vista?" The AFC does not identify the impact as significant, and consequently, no mitigation is proposed. However, the Applicant states that they "will donate funds to the Hayward Area Recreation and Park District (HARD) for providing benches and other amenities on its trail system." The AFC continues: "If the District desires, some of these funds can be used to provide enhancements on portions of the trail to the northwest of the Interpretive Center where views toward Mt. Diablo will not be affected by the RCEC."

**DATA REQUEST**

87. Please indicate whether the Applicant has had any communications with HARD about the project's potential to block views of Mt. Diablo from the Interpretive Center.
88. If the Applicant has communicated with HARD, please discuss whether HARD personnel indicated they would accept the funds and whether they considered "benches and other amenities on its trail system" adequate to compensate for the lost view of Mt. Diablo from the Interpretive Center. Please provide complete contact information for any HARD representatives the Applicant has communicated with.
89. Please provide detailed information on the types and locations of amenities that the Applicant believes would be appropriate to include as enhancements along the trail system.

**BACKGROUND**

The intent of the architectural treatment for the power plant is "to simplify the complexity of the plant's equipment and create a unified visual element that has a sculptural quality" (page 8.13-13). However, the screening structure would be massive, blocking some views of the surrounding hillsides, and from the Hayward Shoreline Interpretive Center, the view of Mt. Diablo. While simplifying the complexity of the power plant's equipment is appropriate, it seems that this could be accomplished with a screening structure or structures that would not block as much of the view of the surrounding hillsides and Mt. Diablo. In particular, it may be possible to open up the view in the area between and around the HRSGs and stacks. Some elements of the power plant behind the proposed screening structure may not require the full height and mass of the screening structure to be effectively screened.

Another intent of the architectural treatment is to make the project a "landmark visual element" at the City of Hayward's western entry. In a letter to the Applicant (AFC Appendix 1C), the City stated that "some kind of architectural treatment is both desirable and appropriate for Russell City Energy Center and that Calpine/Bechtel is moving in the right direction with your plans for architectural treatment." The letter

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continues: "The City will continue to work with Calpine/Bechtel to develop the best possible architectural design for all concerned."

**DATA REQUEST**

90. Please provide simulations of the project (as seen from KOPs 1 – 4) with an architectural treatment that would serve as a landmark visual element and simplify the complexity of the power plant, but would also preserve as much of the Interpretive Center's view of Mt. Diablo as possible. Please provide 11" x 17" high-resolution color photocopies of the visual simulations at life-size scale.

**BACKGROUND**

Table 8.13-2 (RCEC Equipment Dimensions) lists the height of the product water storage tanks at the proposed Advanced Wastewater Treatment Plant (AWT) as 36 feet. However, Figure 2.3-1, a site plan for the AWT, lists the height of these tanks as 42 feet.

**DATA REQUEST**

91. Please clarify the height of the product water storage tanks.
92. If the correct height is 42 feet, please indicate if these tanks would be visible above the landscaping depicted in the simulation of the project from KOP1 (Figure 8.13-3b). If the tanks would be visible, please revise the simulation accordingly.

**BACKGROUND**

Section 8.13.2.3 (page 8.13-14) and Section 8.13.4.1 (page 8.13-21) generally describe the landscaping the Applicant proposes to reduce the visual impacts of the project. Along street frontages, trees will be planted to comply with the requirements of the City of Hayward zoning ordinance. On other sides of the site, tall, fast-growing broadleaf trees will be planted to provide maximum screening of views toward the site. Staff will need to review a conceptual landscape plan in order to conduct the visual analysis of the proposed project and determine the project's compliance with LORS.

**DATA REQUEST**

93. Please provide a conceptual landscape plan with locations of trees, shrubs, and other plants to be used and time to maturity for each species.

**BACKGROUND**

Proposed perimeter landscaping is depicted in simulations of the project ten years after installation. To accurately evaluate potential visual impacts and the effectiveness of this mitigation measure, Staff will need simulations that depict the proposed landscaping, as it would appear at installation and at maturity.

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**DATA REQUEST**

94. Please provide simulations of the project as seen from KOPs 1 - 4 that depict proposed landscaping as it would appear at installation and at maturity. Please provide 11" x 17" high-resolution color photocopies of the visual simulations at life-size scale.

**BACKGROUND**

Section 8.13.2.3 (page 8.13-13) states that three areas may be used for laydown of equipment and parking for construction workers. These areas are generally described as a 10-acre site located north of the project on Depot Road; a four-acre site on the east side of Whitesell Street and South of Enterprise Avenue; and vacant land around PG&E's Eastshore Substation. Staff needs a map showing the exact location of the proposed laydown areas in order to assess the visual impacts from use of the laydown areas.

**DATA REQUEST**

95. Please provide a map at a specified reasonable scale that shows the location of the three proposed laydown areas.

**BACKGROUND**

The AFC (page 8.13-13) states that since the proposed gas pipeline would be buried and the surface conditions restored, the pipeline would not be a source of long-term changes to the visual environment. Staff needs clarification on whether there would be any aboveground features such as a gas metering station at the tie-in point or at other locations along the proposed gas pipeline.

**DATA REQUEST**

96. Please specify whether the proposed gas line would include any aboveground features. If it would, please provide a description of the location, setting, visibility, appearance, visual impacts, and any aesthetic treatment for any and all aboveground features associated with the proposed gas pipeline.

**BACKGROUND**

In the AFC (Section 8.13.2.3, page 8.13-4), the Applicant has proposed a plume-abated cooling tower design. However, the Applicant has not provided any technical specifications or plume modeling information to support their conclusion that the "cooling tower will be designed to prevent the formation of visible plumes under all but the most extreme meteorological conditions." In order to confirm the Applicant's assessment and complete the visual analysis, staff requires additional information regarding the plume mitigation design features of the cooling tower.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**DATA REQUEST**

- 97. Please provide the design basis for the plume-abated cooling tower indicating the ambient condition (temperature and relative humidity) limits at which plumes may form and the associated exhaust conditions of the cooling tower.
- 98. For staff to conduct Combustion Stack Visibility Program (CSVP) modeling of the plume-abated cooling tower exhaust, please provide at a minimum cooling tower operating data to fill the following table. The values must correspond to maximum heat rejection operating conditions at the specified ambient conditions.

Ambient Condition	Exhaust Velocity (m/s)	Exhaust Flow Rate (lbs/hr/cell)	Moisture Content (% by weight)	Exhaust Temperature (°F)
30°F, 80% RH				
30°F, 60% RH				
30°F, 40% RH				
40°F, 80% RH				
40°F, 60% RH				
40°F, 40% RH				
50°F, 80% RH				
50°F, 60% RH				
50°F, 40% RH				

Please note that staff intends to model the plume-abated cooling tower using hourly estimated exhaust conditions based on the hourly ambient conditions of the meteorological file used to perform the modeling. The cooling tower exhaust conditions will be interpolated based on the exhaust values given. Therefore, additional combinations of temperature and relative humidity, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions.

- 99. Please indicate if the Applicant is willing to stipulate to a Condition of Certification that specifies the level of plume mitigation as described above. If so, please provide an example of what the Applicant would consider an acceptable cooling tower plume mitigation Condition of Certification.
- 100. Please provide a plume frequency and size modeling assessment of the proposed cooling tower and provide electronic copies of the modeling input and output files and the meteorological files.
- 101. Please indicate whether there are any other sources of water vapor plumes within the project viewshed. If there are other sources of plumes, please show the locations of these facilities on a map at a specified reasonable scale.

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

**BACKGROUND**

The visible water vapor plume discussion in the AFC (pages 8.13-4 and 8.13-18) does not provide detailed information regarding the frequency and size characteristics of the HRSG exhaust stack water vapor plumes. The AFC states: "With the design being used for the HRSGs, water vapor plumes will not be seen emanating from the plant's HRSG stacks, under nearly any circumstances. However, on a few occasions during the year when temperatures are extremely low and humidity is extremely high, very wispy-plumes coming from the stacks may be visible." In order to confirm the Applicant's assessment and complete the visual analysis, staff requires additional information regarding the plume mitigation design features of the HRSGs.

**DATA REQUEST**

102. Please provide the design basis for the plume-abated HRSG exhaust indicating the ambient condition (temperature and relative humidity) limits at which plumes may form and the associated exhaust conditions.
103. For staff to conduct CSVP modeling of the plume-abated HRSG exhaust, please provide at a minimum HRSG exhaust parameter data to fill the following table. The values must correspond to maximum heat rejection operating conditions at the specified ambient conditions.

Ambient Condition	Moisture Content (% by weight)	Exhaust Flow Rate (lbs/hr)	Exhaust Temperature (°F)
<b>load with Duct Firing and Power Augmentation</b>			
30°F, 80% RH			
30°F, 60% RH			
30°F, 40% RH			
40°F, 80% RH			
40°F, 60% RH			
40°F, 40% RH			
50°F, 80% RH			
50°F, 60% RH			
50°F, 40% RH			
<b>load with Power Augmentation no Duct Firing</b>			
30°F, 80% RH			
30°F, 60% RH			
30°F, 40% RH			
40°F, 80% RH			
40°F, 60% RH			
40°F, 40% RH			

**Russell City Energy Center  
Data Requests  
(01-AFC-7)**

50°F, 80% RH			
50°F, 60% RH			
50°F, 40% RH			
<b>load no Duct Firing and no Power Augmentation</b>			
30°F, 80% RH			
30°F, 60% RH			
30°F, 40% RH			
40°F, 80% RH			
40°F, 60% RH			
40°F, 40% RH			
50°F, 80% RH			
50°F, 60% RH			
50°F, 40% RH			

Please note that staff intends to model the HRSG exhausts using hourly estimated exhaust conditions based on the hourly ambient conditions of the meteorological file used to perform the modeling. Therefore, additional combinations of temperature and relative humidity, if provided by the Applicant, will be used to more accurately represent the HRSG exhaust conditions.

104. Please indicate if the Applicant is willing to stipulate to a Condition of Certification that specifies the level of HRSG plume mitigation as described above. If so, please provide an example of what the Applicant would consider to be an acceptable HRSG plume mitigation Condition of Certification.
105. Please provide a plume frequency and size modeling assessment of the proposed HRSGs and provide electronic copies of the modeling input and output files and the meteorological files.

**BACKGROUND**

The Hayward Air Terminal is located about 1.5 miles north of the project site. The discussion on night lighting (page 8.13-14) does not indicate if the HRSG stacks and architectural screening structure will require aviation safety lighting.

**DATA REQUEST**

106. Please specify whether the HRSG stacks and architectural screening structure will require illumination to meet Federal Aviation Administration (FAA) or other federal, state, or local aviation safety requirements. If so, please provide a description of lighting, including the locations and heights where lights will be installed.



Calpine Corporation

Clean Energy for the 21st Century



Bechtel Enterprises Holdings, Inc.

May 22, 2001

RECEIVED  
FISH & WILDLIFE OFFICE

DOCKET  
01-AFC-7  
DATE MAY 22 2001  
RECD. MAY 22 2001

Mr. Steve Larson  
Executive Director  
California Energy Commission  
1516 Ninth Street  
Sacramento, California 95814

Dear Mr. Larson:

In accordance with the provisions of Title 20, California Code of Regulations, Calpine Corporation (Calpine) and Bechtel Enterprises Holdings, Inc. (Bechtel), hereby submit this Application for Certification (AFC) seeking authority to construct and operate the Russell City Energy Center, a 600-megawatt, natural gas-fired, combined-cycle power plant to be located in the City of Hayward, California. Calpine/Bechtel respectfully request that the Russell City Energy Center AFC be reviewed under the expedited six-month licensing process as set forth in Public Resources Code 25550.

Approximately 10 acres of the 14.7-acre proposed site for the Russell City Energy Center is currently occupied by the transmitter facilities of Radio Station KFAX, AM 1100. The owner of KFAX has applied to the City of Hayward for permission to construct and operate new transmitter facilities on a closed City of Hayward landfill located approximately 1.25 miles from the existing transmitter facility. The City of Hayward is currently preparing an environmental document, in compliance with the provisions of the California Energy Quality Act (CEQA) that addresses the demolition of the existing KFAX transmitter facility and construction of the new transmitter facility. Calpine/Bechtel has been advised that completion of the City of Hayward's CEQA review is anticipated by mid summer 2001. A copy of the City's environmental clearance document will be submitted to the California Energy Commission Docket Office when it becomes available.

As officers of the respective Companies, we hereby attest, under penalty of perjury, that the contents of this application are truthful and accurate to the best of our knowledge.

Dated this 22nd day of May, 2001

Sincerely,

Curt Hildebrand  
Vice-President-Calpine Corporation  
General Manager-Calpine/Bechtel Joint Development

Robert Duncan  
Vice President and Manager  
Bechtel Enterprises Holdings, Inc.

Attachments



"Alex Ameri" <AlexA@ci.hayward.ca.us>

06/19/2001 10:00 AM

To: jimd@calpine.com  
cc: andrea@argonautconsulting.com, ddavy@fwenc.com  
Subject: RCEC's Sanitary Wastewater Flows

Mr. Dunstan:

It is my understanding that the California Energy Commission (CEC) staff has requested that the City of Hayward clarify that it is willing and able to accept sanitary wastewater flows from the proposed Russell City Energy Center. The City would accept these wastewater flows, subject to the standards and provisions of the City's wastewater discharge regulations. We do not anticipate any difficulty in accepting the sanitary wastewater flows described in your Application for Certification to the CEC.

Alex Ameri, P.E.  
Deputy Director of Public Works for Utilities  
777 "B" Street  
Hayward, CA 94541-5007  
Tel. (510)583-4720  
Fax (510) 583-3610  
email: alexa@ci.hayward.ca.us



bhartman@fwenc.co  
m

07/30/01 04:10 PM

To: don\_hankins@fws.gov  
cc:  
Subject: Re: Russell City Energy Center

Hi Don,

I don't know if you remember me, but I work for Foster Wheeler Environmental. One of my projects is the proposed Calpine/Bechtell Russell City Energy Center, located in the City of Hayward, Alameda County. On April 30 we had a meeting with you and Dan Buford, in which we discussed potential biological issues associated with the project. I am following up on our meeting, to discuss whether the USFWS can issue a letter of concurrence, or if Section 7 consultation is needed.

As a brief reminder:

There was concern about the effect of noise on wildlife. The property adjacent to the proposed power plant site has marginal habitat (diked seasonal wetland with sparse Salicornia, Cotula, and several ruderal species) for the Salt Marsh Harvest Mouse as well as bird species that frequent diked seasonal wetlands. No federally listed bird species were observed in surveys; however, it was agreed that the presence of suitable habitat can be used as an indicator of the presence of the harvest mouse.

A second issue of concern was the relocation of the radio transmission towers that are currently on the proposed property, to the Old West Winton Landfill. USFWS expressed concern about the potential for bird collisions with the transmission towers, as well as creation of raptor perches. An analysis of these issues was requested.

Last, there was concern about the potential for the landscaping trees to provide nesting habitat for species such as crows.

Calpine/Bechtell has submitted the Application for Certification (AFC) to the California Energy Commission (CEC). Potential project effects on biological resources are discussed in detail in Chapter 8.2. The radio transmission tower relocation is addressed in an Initial Study prepared by the City of Hayward. Hopefully these parties have submitted the documents to your office for review. If you require any additional documentation, please let me know.

I understand you are often in the field or in meetings, and e-mail is the best mode of communication. Otherwise I can be reached at 916-928-4825.

Thank you,  
Brett D. Hartman  
Ecologist  
Foster Wheeler Environmental Corp.  
916-928-4825 (phone)  
916-928-0594 (fax)

*→ Waste mgmt. may not be willing to sell wetland habitat, could we come up w/ a ratio to preserve habitat.*



**bhartman@fwenc.co**  
**m**

07/31/01 11:36 AM

To: don\_hankins@fws.gov  
cc:  
Subject: Re: Russell City Energy Center

Don,

I just got off the phone with Stuart Itoga, biologist from the CEC. He confirmed that the Radio Transmission tower relocation is not part of the AFC. It is being handled as a separate project by the City of Hayward. Any mitigation measures for that project should be addressed in the NEPA/CEQA Initial Study prepared by the City of Hayward, not by Calpine/Bechtell.

I'll be looking forward to your letter, and we'll talk soon.

Brett

----- Forwarded by Brett Hartman/Sacramento/FWENC on 07/31/01 11:36 AM

-----

Brett Hartman

07/30/01  
06:10 PM CDT

To: don\_hankins@fws.gov  
cc:  
Subject: Re: Russell City Energy

Center

Hi Don,

I don't know if you remember me, but I work for Foster Wheeler Environmental. One of my projects is the proposed Calpine/Bechtell Russell City Energy Center, located in the City of Hayward, Alameda County. On April 30 we had a meeting with you and Dan Buford, in which we discussed potential biological issues associated with the project. I am following up on our meeting, to discuss whether the USFWS can issue a letter of concurrence, or if Section 7 consultation is needed.

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Last, there was concern about the potential for the landscaping trees to provide nesting habitat for species such as crows.

Calpine/Bechtell has submitted the Application for Certification (AFC) to the California Energy Commission (CEC). Potential project effects on biological resources are discussed in detail in Chapter 8.2. The radio transmission tower relocation is addressed in an Initial Study prepared by the City of Hayward. Hopefully these parties have submitted the documents to your office for review. If you require any additional documentation, please let me know.

I understand you are often in the field or in meetings, and e-mail is the best mode of communication. Otherwise I can be reached at 916-928-4825.

Thank you,

Brett D. Hartman  
Ecologist  
Foster Wheeler Environmental Corp.  
916-928-4825 (phone)  
916-928-0594 (fax)



DDavy@fwenc.com  
10/29/01 06:11 PM

To: don\_hankins@fws.gov  
cc: jileahy@calpine.com, jimd@calpine.com, pmason@calpine.com,  
andrea@argonautconsulting.com, glw@eslawfirm.com,  
bhartman@fwenc.com  
Subject: Russell City Energy Center

Don,

Thank you for your quick response to my inquiry about the Russell City Energy Center today. In response to your question about the potential for salt marsh habitat at the East Shore Substation, the following is Brett Hartman's analysis.

Doug Davy  
Foster Wheeler Environmental Corporation  
3947 Lennane Drive, Suite 200  
Sacramento, CA 95834  
(916) 928-4805  
(916) 928-0594 (fax)  
ddavy@fwenc.com

----- Forwarded by Douglas Davy/Sacramento/FWENC on  
10/29/2001 06:07 PM -----

From: Brett Hartman on 10/29/2001 02:22 PM CST

To: Douglas Davy/Sacramento/FWENC@FWENC  
cc:  
Subject: Salt marsh harvest mouse habitat at the substation

Doug,

The PG&E substation does not provide habitat for the salt marsh harvest mouse for several reasons. First, the area does not receive any marine influence, and the harvest mouse is generally found in the high marsh and marsh/upland ecotone.

Second, while the substation probably provided upland refugia (e.g. escape areas during flood events) at one time, the area is currently isolated viable salt marsh habitat by industrial/commercial development. i.e. the distribution corridor is too adverse for use during flood events, and the energetics are not favourable.

Third, the area is periodically disked, destroying any salt grass habitat and allowing the invasion of ruderal weeds.

Hope this helps, any more questions just let me know.

Brett



"Stuart Itoga"  
<Sitoga@energy.state  
.ca.us>

11/09/01 02:08 PM

To: <don\_hankins@fws.gov>  
cc: "Dick Ratiiff" <Dratliff@energy.state.ca.us>, "Jim Brownell"  
<Jbrownel@energy.state.ca.us>, "Kae Lewis"  
<Klewis@energy.state.ca.us>, "Rick York"  
<Ryork@energy.state.ca.us>

Subject: Russell City Energy Center

Hi Don,

As per your request, here's the list of potential impacts and associated mitigation measures we would like the applicant to address.

- **Perch deterrent monitoring and contingency plan.** As we discussed at our meeting on 8 November 2001, the applicant proposed perch deterrent methods in the Biological Assessment submitted on 21 September 2001. Although the proposed methods to prevent perching/roosting seemed acceptable, the monitoring plan was not included in the BA, as per USFWS guidance. In a meeting on 30 August 2001 at the USFWS offices in Sacramento, Dan Buford specifically stated the need for a perch deterrent monitoring plan. Further, Dan also stated that a management plan would be needed if monitoring indicated perch deterrents were ineffective. In a conference call on 7 September 2001, the applicant, yourself and CEC staff discussed what should be included in the Biological Assessment. Specifically requested were the monitoring and contingency plans. During a conversation with Doug Davey and Brett Hartman of Foster Wheeler on 26 September 2001, I was informed that the monitoring and contingency plans were not submitted because the applicant was nearing closure on the informally proposed habitat compensation. Habitat compensation, in our opinion, does not mitigate for other impacts associated with the project. Staff has written a condition which would require the applicant to provide monitoring and contingency plans for agency review and approval (see Staff Assessment, Biological Resources Condition of Certification *BIO-14*, pages 3.2-26-3 2-27 ).
- **Habitat compensation.** Although the applicant has informally discussed habitat compensation, no formal proposal has been received. Although staff would accept applicant's informal proposal (22 acre upland parcel adjacent to plant site) as compensation for habitat impacts associated with the project, staff does not consider habitat compensation and an endowment fund mitigation for other project impacts. For its analysis, staff considered all habitats permanently or temporarily affected by the proposed project. In addition to wetlands and annual grasslands, areas of ruderal vegetation were considered habitat (see Staff Assessment, Biological Resources Section, Discussion of Impacts section, *Permanent and Temporary Habitat Loss*, pages 3 2-11-3 2-12 ). Should the upland parcel informally discussed be unavailable as compensation, habitat ratios would be used to develop suitable habitat compensation. This strategy was also discussed with Dan Buford at the meeting on 30 August 2001. Staff has written a condition that would require suitable compensation for the project's permanent and temporary habitat impacts (Biological Resources Condition of Certification, *BIO-10*, page 3.2-25 ).
- **Construction and operational noise levels.** Staff and the East Bay Regional Park District are concerned that construction noise associated with pile driving and steam blows will have an adverse affect on sensitive breeding/nesting species in the area (see Biological Resources Discussion of Impacts, *Construction and Operational Noise*, page 3.2-10). Staff used 60 dBA as a reference point in assessing possible impacts to sensitive species in the project area. Dan Buford concurred with staff at the 30 August 2001 meeting that 60 dBA is used by the USFWS as a reference point when evaluating noise impacts to wildlife. Staff also expressed concern that operational noise could hinder the intraspecific communication abilities of wildlife (i.e. bird vocalizations) in the upland area adjacent to the proposed site. Dan conveyed his opinion that this was a legitimate concern. Staff would like to see a more pro-active approach to mitigate noise impacts than what has been proposed by the applicant. Staff has written a condition to mitigate construction and operational noise associated with the RCEC (see Biological Resources Condition of Certification, *BIO-12*, pages 3.2-25-3.2-26 ).
- **Bird Flight Diverters.** Dan Buford, in the 30 August meeting, expressed concern about the potential for bird collisions with RCEC transmission lines. This is also a concern of staff and the East Bay Regional Park District. The applicant has expressed the opinion that collisions will probably not be significant, but has proposed the use of streamers on transmission lines associated with the project. Staff has written a condition that would require all ground wires associated with RCEC transmission lines be fitted with agency approved bird flight diverters (see Biological Resources Condition of Certification, *BIO-13*, page 3.2-26 ).

Please call me at 916-654-4161 with any questions/comments. I hope this is of assistance to you when you draft your letter to the applicant. I'm still working on pulling together the noise info. I'll get that to you early next week. Thanks for coming down and meeting with us.



JOE DIDONATO  
<jdidonat@ebparks.org>  
rg>

12/05/01 10:13 AM

To: don\_hankins@fws.gov  
cc: rbeers@beerslaw.com, HAYWARD@ebparks.org,  
LTONG@ebparks.org  
Subject: Russel City Energy Plant

Hi Don,

Consider this an "official" request for information regarding exposure limits of sensitive species to noise, pollutants, emissions and bioaccumulants which can occur as a result of factories, power plants, etc.

We have had a consultant, Dr. Phyllis Fox, analyze the CalPine document for it's ability to recognize and mitigate these impacts. Briefly, she has identified acrolein as one of the most toxic substances in turbine exhaust. Acrolein emissions are higher during start up and shut down operations as a result of reduced combustion efficiency. There are at least 832 hours of start up mode scheduled for the plant.

For one opinion on acrolein, here is a website  
<http://www.atsdr.cdc.gov/tfacts124.html>

Additionally, Dr. Fox has identified chlorination, as a result of the water utilized by the cooling towers, as a process which forms a class of toxic compounds known as THMs (trihalomethanes, including chloroform, bromodichloromethane and others.

Nitrogen, ammonia, and phosphorus residues emitted through the cooling towers can stimulate the growth of plants in the marshes, most notably *Spartina alterniflora*, the invasive cordgrass, which has severely affected the clapper rail habitat in Cogswell and other nearby marshes, including the Don Edwards NWR complex.

As I mentioned earlier, the "standard" location for noise impacts is recorded at 5 feet above ground. This is based on average height for humans. I think the noise and vibration anticipated from both construction and operation of the plant have been inadequately addressed as it pertains to ground-dwelling species like SMHM and rails.

Anyway, I'd appreciate any information or references you can share. My fax is 510-635-3478 or just return info via this email response. Looking forward to hearing from you.  
Thanks

Todd Marse - EPA  
Russell City

↳ lead agency for air and water

# 415 972-3976  
fax 415 947-3579

[marse.todd@epa.gov](mailto:marse.todd@epa.gov)

↳ email also questions re? previous  
burns.


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[Division of Toxicology](#)
[CAS#](#)
[Highlights](#)
[What is it?](#)
[What happens to it in the environment?](#)
[How might I be exposed to it?](#)
[How can it affect my health?](#)
[How likely is it to cause cancer?](#)
[Is there a medical test for exposure?](#)
[Are there federal recommendations?](#)
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## Acrolein

**CAS# 107-02-8**
**July 1999**

*This fact sheet answers the most frequently asked health questions about acrolein. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.*

**HIGHLIGHTS:** Exposure to acrolein occurs mostly from breathing it in the air. Cigarette smoke and automobile exhaust contain acrolein. Acrolein causes burning of the nose and throat and can damage the lungs. This chemical has been found in at least 7 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What is acrolein? (Pronounced ak'roh-line)

Acrolein is a clear or yellow liquid with a disagreeable odor. It dissolves in water very easily and quickly changes to a vapor when heated. It also burns easily. Small amounts of acrolein can be formed and can enter the air when trees, tobacco, other plants, gasoline, and oil are burned. Acrolein is used as a pesticide to control algae, weeds, bacteria, and mollusks. It is also used to make other chemicals.

### What happens to acrolein when it enters the environment?

- Acrolein may be found in soil, water, or air.
- It breaks down fairly rapidly in the air (about half will disappear within 1 day) by reacting with other chemicals and sunlight.
- Acrolein evaporates rapidly from soil and water.
- Once dissolved in water, acrolein can be broken down to other chemicals by reactions with water or bacteria.
- Acrolein does not build up in the food chain.

### How might I be exposed to acetone?

- Breathing contaminated air near hazardous waste sites that contain acrolein.
- Smoking tobacco or breathing air containing tobacco smoke or automobile exhaust.
- Working in, or living near, industries where it is manufactured or used to make other chemicals.
- Drinking water containing small amounts of acrolein.
- Eating foods, such as fried foods and roasted coffee, that may contain small amounts of acrolein.

### How can acrolein affect my health?

There is very little information about how exposure to acrolein affects people's health. The information we have indicates that breathing large amounts damages the lungs and could cause death. Breathing lower amounts may cause eye watering and burning of the nose and throat and a decreased breathing rate

Animal studies show that breathing acrolein causes irritation to the nasal cavity, lowered breathing rate, and damage to the lining of the lungs

We do not know if acrolein causes reproductive effects or birth defects in people or animals.

#### **How likely is acrolein to cause cancer?**

There are no definitive studies on the carcinogenic effects of acrolein in people or animals. The International Agency for Research on Cancer (IARC) has determined that acrolein is not classifiable as to human carcinogenicity

#### **Is there a medical test to show whether I've been exposed to acetone?**

Methods have been developed to detect acrolein or breakdown products of acrolein in biological or environmental samples, however, there are no specific medical tests available in a doctor's office to determine if you have been exposed to acrolein.

#### **Has the federal government made recommendations to protect human health?**

The EPA recommends that levels in lakes and streams should be limited to 0.32 parts of acrolein per million parts of water (0.32 ppm) to prevent possible health effects from drinking water or eating fish contaminated with acrolein. Any release to the environment of more than 1 pound of acrolein must be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.1 ppm over an 8-hour workday, 40-hour workweek

The National Institute of Occupational Safety and Health (NIOSH) recommends that average workplace air should not exceed 0.1 ppm acrolein averaged over a 10-hour period or a 40-hour workweek.

The federal recommendations have been updated as of July 1999

#### **Glossary**

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

National Priorities List: A list of the nation's worst hazardous waste sites.

Pesticide: A substance that kills pests

ppm: Parts per million

#### **Source of Information**

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for acrolein. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Animal testing is sometimes necessary to find out how toxic substances might harm people and how to treat people who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

**Where can I get more information?**

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns

**For more information, contact:**

Agency for Toxic Substances and Disease Registry  
 Division of Toxicology  
 1600 Clifton Road NE, Mailstop E-29  
 Atlanta, GA 30333  
 Phone: 1-888-422-8737  
 FAX: (404)498-0057

**External safety and chemistry information (please see our disclaimer):**

**Acrolein**  
 $C_3H_4O$

Stereo Image  
 MDL [Molfile](#)



NFPA Label Key

[Vermont SRI MSDS Archive](#)

ATSDR Information Center / [ATSDR/IC/atcdc.gov](http://ATSDR/IC/atcdc.gov) / 1-888-422-8737

This page last updated on June 11, 2001

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 U.S. Department of Health and Human Services



"Stuart Itoga"  
<Sitoga@energy.state  
.ca.us>

To: <Don\_Hankins@fws.gov>  
cc:  
Subject: Re: Russell City

09/28/01 09:12 AM

Hi Don,

I had an interesting conversation with Doug Davy the other day concerning the BA Calpine recently submitted. Apparently, the omission of the perch deterrant monitoring plan was not inadvertent. I was informed(off the record) that the applicant is close to finalizing the deal to purchase the Waste Mangement property adjacent to the proposed site. They seem to feel that if they provide this property as compensation, that the agencies involved will consider habitat compensation as mitigation for other impacts as well. I wanted to let you know that I do not think this will work as far as the Commission is concerned. Please let me know what your thoughts are on this matter.

Stuart Itoga  
Staff Biologist  
California Energy Commission  
1516 9th Street, Sacramento, CA 95814  
916-654-4161  
fax 916 654 4421  
[stoga@energy.state.ca.us](mailto:stoga@energy.state.ca.us)

>>> <Don\_Hankins@fws.gov> 09/26/01 10:13AM >>>

I haven't received the BA.

Don Hankins  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95841  
(916) 414-6625 Fax (916) 414-6713

"Stuart Itoga"  
<Sitoga@energy.state.ca.us> To: <don\_hankins@fws.gov>  
cc:  
Subject: Russell City  
09/26/01 09:55 AM

Don,  
I am reviewing the Biological Assessment for Russell City now. Appendix F  
(the monitoring plan is missing from both the electronic and hard copies I  
received. I was wondering if your copy contained Appendix F?



"Priestley, Tom/SFO"  
<tpriestl@CH2M.com  
>

To: "don\_hankins@fws.gov" <don\_hankins@fws.gov>  
cc: "Koford, EJ/SAC" <ejkoford@CH2M.com>  
Subject: Pacific Shores tree list

09/28/01 03:25 PM

Don.

As I mentioned in the voice mail message I just left for you, I am interested in learning more about the tree list developed for the Pacific Shores project that you e-mailed to Andrea Grenier on September 12.

Some of my questions include:

the location and nature of the project

who it was that developed the tree suitability assessment (was it the developer? a consultant? USFWS staff?)

what the raptor species of interest were

the research studies used in developing the tree rating system

whether there is any documentation of the assumptions and sources used in developing the rating

the availability of any similar plant ratings that you might be aware of

I can be reached at the phone number indicated below.

Thank you,

Thomas Priestley  
Senior Environmental Planner  
CH2M Hill  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612

Telephone: 510.251.2888 Ext. 2153  
Fax: 510.622.9153

e-mail: tpriestl@ch2m.com



**andrea@argonautcon  
sulting.com**  
Sent by:  
andrea@argonautcon  
sulting.com

09/06/01 09:20 AM  
Please respond to  
andrea

To: sitoga@energy.state.ca.us;klewis@energy.state.ca.us;ryork@energy.state.ca.us;don\_hankins@fws.gov;ddavy@fwenc.com;bhartman@fwenc.com;dcarrier@fwenc.com;;;;;  
cc: jileahy@calpine.com;jimd@calpine.com;misaacs@calpine.com;;  
Subject. Conference call re: Russell City Energy Center

Hello everyone:

We have scheduled a conference call for this Friday, September 7th, at 2:00 pm to discuss comments received from the USFWS regarding the proposed Russell City Energy Center Project. I have set up an AT&T call in number (details are below) to facilitate the conference call. If you have any questions, please do not hesitate to contact me.

Dial in #: 1-800-403-2002  
Host code (Andrea only): 163039  
Participant code: 613454

Andrea Grenier  
(916) 722-4068



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

September 21, 2001  
SO-2449-092101-DD

Ms. Jan C. Knight  
Chief, Endangered Species Division  
United States Department of the Interior  
Fish and Wildlife Service  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

**SUBJECT: BIOLOGICAL ASSESSMENT, RUSSELL CITY ENERGY CENTER  
HAYWARD, CALIFORNIA**

Dear Ms. Knight:

Attached are three copies of a Biological Assessment for the Russell City Energy Center project in Hayward, California. This Biological Assessment addresses the Fish and Wildlife Service's comments on the Russell City Energy Center Application for Certification before the California Energy Commission, as expressed in your letter of August 21, 2001 to Mr. Calvin Fong of the U.S. Army Corps of Engineers. We believe that the Biological Assessment addresses all of your concerns regarding the potential effect of the Russell City Energy Center on threatened or endangered species. With the mitigation measures proposed in the Biological Assessment, we believe that the project would not be likely to have significant adverse effects on the salt marsh harvest mouse, California clapper rail, California least tern, or western snowy plover.

If you have any questions about this matter, please contact me or Brett Hartman at (916) 928-0202.

**RECEIVED**  
SEP 21 2001  
SACRAMENTO  
FISH & WILDLIFE OFFICE

Sincerely,

Douglas M. Davy, Ph.D.  
AFC Project Manager

cc: Calvin Fong, USACE  
Stuart Itoga, CEC  
Andrea Grenier, Calpine/Bechtel



3947 LENNANE DRIVE, SUITE 200, SACRAMENTO, CA 95834-1973  
TEL: 916-928-0202 FAX: 916-928-0594

2899 00081



# FOSTER WHEELER ENVIRONMENTAL CORPORATION

April 22, 2001

Mr. Dan Buford  
Chief, Delta and Coastal Bay Programs  
U.S. Fish & Wildlife Service  
2800 Cottage Way, Rm W-2605  
Sacramento, CA  
95825-1846

RECEIVED

APR 23 2001

U.S. FISH & WILDLIFE SERVICE

Dear Mr. Buford,

At the request of Jan Knight (Chief, Endangered Species Division), we are sending relevant materials for the proposed Russell City Energy Project, Alameda County, California. Enclosed, please find:

1. Correspondence with Mr. Don Henkins, dated March 22, 2001.
2. List of special status plant and animals potentially occurring in the Russell City Energy Project area.
3. List of plant and animal species observed in the Russell City Energy Project area.
4. Results of the CNDDDB/Rare Find database search plotted on a topographic map.
5. Two aerial photographs delineating significant biological resources in the Russell City Energy Project area.

We are in the process of arranging a meeting to begin informal consultation on the project as soon as possible. Thank you for your attention to this matter, and I look forward to meeting you.

Sincerely,

Brett D. Hartman  
Ecologist

Cc: Jan Knight  
Andrea Grenier  
Marriana Isaacs  
Dean Carrier





# FOSTER WHEELER ENVIRONMENTAL CORPORATION

March 22, 2001

Mr. Don Henkins  
US Fish & Wildlife Service  
2800 Cottage Way  
Suite 2605  
Sacramento, CA  
95825

Dear Mr. Henkins,

This letter is a follow up to our conversation of March 15, 2001, in which we discussed the Application for Certification (AFC) for the Russell City Energy Center in Hayward, California. We would like to begin informal consultation regarding potential project effects on the salt marsh harvest mouse, the California least tern, and the California clapper rail.

The proposed Russell City Energy Center is a 600 MW is a natural gas-fired combined-cycle baseload merchant power plant. It will have 2 combustion turbines and 1 steam turbine. The proposed site is 3636 Enterprise Avenue, in the City of Hayward, Alameda County (Figure 1). The site is currently occupied by the KFAX radio station transmission towers. The four 224 – foot high radio transmission towers will be relocated to the Old West Winton Landfill panhandle, located on the northern end of the City of Hayward sewage treatment ponds.

The habitat at the KFAX property is dominated by annual grassland, with patches of seasonal wetland dominated by saltgrass (*Distichlis spicata*). The proposed site is located northeast of the Hayward Area Recreation District (HARD) Marsh (Figures 2 & 3), known habitat for the salt marsh harvest mouse, the California least tern, and the California clapper rail. The issues discussed in our phone conversation were:

1. The project would fill adjacent upland habitat at the KFAX property. There is no designated critical habitat for the salt marsh harvest mouse; however, adjacent upland habitat is sometimes utilized by this species as a refugium during flood and high tide events.
2. The potential creation of roosting habitat for raptors on the power plant stacks. Raptors are predatory species that could impact the salt marsh harvest mouse, the California least tern, and the California clapper rail.
3. Potential bird collision and mortality associated with the relocated radio transmission towers.
4. The potential growth inducing effect of the proposed power plant.

I am currently in the process of gathering data to evaluate these issues, and will be providing this information to facilitate informal consultation. If you have any additional data needs, or if additional issues arise, please don't hesitate to contact me.

I look forward to working with you.

Sincerely,

Brett D. Hartman

Encl: Figures 1, 2 & 3



3947 LENNANE DRIVE, SUITE 200, SACRAMENTO, CA 95834-1973  
TEL: 916-928-0202 FAX: 916-928-0594

2899 00083

**Tabl 8.2.1.** Special status plant species potentially occurring in the Russell City Energy Center project area.

Scientific Name	Common Name	Federal/ State/ CNPS <sup>a</sup>	Source <sup>b</sup>	Habitat in impact area?	Blooms
<i>Astragalus tener</i> var. <i>tener</i>	Alkali milk-vetch	SC/--/1B	1,2	Yes	Mar-May
<i>Atriplex depressa</i>	Brittlescale	SC/--/1B	1	No	May-Oct
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	Big-scale balsamroot	--/--/1B	2	No	Mar-June
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	Point Reyes bird's-beak	SC/--/1B	1	Yes	Jun-Oct
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	SC/R/1B	2	Marginal	Jul-Sep
<i>Fritillaria liliacea</i>	Fragrant fritillary	SC/--/1B	2	No	Feb-Apr
<i>Helianthella castanea</i>	Diablo rock rose	SC/--/1B	1	No	Apr-Jun
<i>Hemizonia parryi</i> ssp. <i>congdonii</i>	Congdon's tarplant	SC/--/1B	2	No	Jun-Nov
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellog's horkelia	SC/--/1B	2	No	Apr-Sept
<i>Lasthenia conjugens</i>	Contra Costa goldfields	E/--/1B	1,2	No	Mar-Jun
<i>Lathyrus jepsonii</i>	Delta tule pea	SC/--/1B	1	Marginal	May-Jun
<i>Lilaeopsis masonii</i>	Masons lilaeopsis	SC/R/1B	1	No	Apr-Oct
<i>Plagiobothrys glaber</i>	Hairless popcorn-flower	SC/--/1A	2	Yes	Apr-May
<i>Suaeda californica</i>	California seablite	PE/--/1B	1	Marginal	Jul-Oct

<sup>a</sup> **Status Categories:**

Federal status determined from a USFWS letter (\_\_\_\_). State status determined from *Special Plants List* (June 1999), and/or *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (April 1999), prepared by DFG Natural Diversity Data Base. CNPS status determined from *CNPS Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994). Codes used in table are as follows:

**E** = Endangered; **T** = Threatened; **R** = California Rare; **PE** = Proposed Endangered

**C** = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

**SC** = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

**SSC** = DFG "Species of Special Concern."

CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere; **3** = Need more information; **4** = Plants of limited distribution.

-- = Species not state-listed.

<sup>b</sup> **Source:** 1 = From USFWS letter (\_\_\_\_). 2 = From CNDDDB/ RareFind.

**Tabl 8.2-2. Special status wildlife species evaluated in the RCEC project areas.**

Scientific Name	Common Name	Federal/ State <sup>a</sup>	Habitat in impact area?	Source <sup>b</sup>
<b>Mammals</b>				
<i>Corynorhinus townsendii townsendii</i>	Pacific western big eared bat	SC/CSC	No	1
<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC/CSC	No	1
<i>Myotis evotis</i>	Long eared bat	SC/--	No	1
<i>Myotis thysanodes</i>	Fringed myotis bat	SC/--	No	1
<i>Myotis volans</i>	Long legged myotis bat	SC/--	No	1
<i>Myotis yumanensis</i>	Yuma myotis bat	SC/CSC	No	1
<i>Neotoma fuscipes annectens</i>	San Francisco dusky footed woodrat	SC/CSC	No	1
<i>Reithrodontomys raviventris</i>	Salt-marsh harvest mouse	E/E	Yes	1,2
<i>Sorex vagrans halicoetes</i>	Salt-marsh wandering shrew	SC/CSC	Yes	1,2
<b>Birds</b>				
<i>Accipiter striatus</i> (nesting)	Sharp-shinned hawk	--/SSC	No	2
<i>Agelaius tricolor</i> (nesting colony)	Tricolored blackbird	SC/CSC	Yes	1,2
<i>Amphispiza belli belli</i>	Bell's sage sparrow	SC/CSC	No	1
<i>Aquila chrysaetos</i> (nesting & wintering)	Golden Eagle	--/SSC	No	2
<i>Ardea herodias</i> (rookery)	Great blue heron	--/--	No	2
<i>Asio flammeus</i> (nesting)	Short-eared owl	--/SSC	No	2
<i>Athene cunicularia hypugea</i> (burrow sites)	Western burrowing owl	SC/CSC	Yes	1,2
<i>Branta canadensis leucopareia</i>	Aleutian Canada goose	T/--	No	1
<i>Buteo regalis</i>	Ferruginous hawk	SC/CSC	Winter foraging	1
<i>Charadrius alexandrinus nivosus</i> (nesting)	Western snowy plover	T/CSC	No	1,2
<i>Circus cyaneus</i> (nesting)	Northern harrier	--/CSC	Yes	2
<i>Elanus leucurus</i> (nesting)	White-tailed kite	--/--	Yes	2
<i>Falco peregrinus anatum</i>	American peregrine falcon	--/E	Yes-foraging	1
<i>Geothlypis trichas sinuosa</i>	Saltmarsh common yellowthroat	SC/CSC	Marginal foraging	1,2
<i>Haliaeetus leucocephalus</i>	Bald eagle	T/E	No	1,2
<i>Laterallus jamaicensis coturniculus</i>	California black rail	SC/T	Marginal	2
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	SC/CSC	Yes	1
<i>Pelecanus occidentalis californica</i>	California brown pelican	E/E	No	1
<i>Phalacrocorax auritus</i>	Double-crested cormorant	--/SSC	Yes	2
<i>Rallus longirostris obsoletus</i>	California clapper rail	E/E	Yes	1,2
<i>Rynchops niger</i>	Black Skimmer	--/SSC	Yes	2
<i>Riparia riparia</i> (nesting)	Bank swallow	--/T	No	2
<i>Sterna antillarum browni</i> (nesting colony)	California least tern	E/E	No	1,2
<b>Reptiles</b>				
<i>Clemmys marmorata marmorata</i>	Northwestern pond turtle	SC/CSC	Marginal	1
<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	SC/CSC	Marginal	1

**Tabl 8.2-2 (cont.)**

Scientific Name	Common Name	Federal/ State <sup>a</sup>	Habitat in impact area?	Source <sup>b</sup>
<b>Reptiles (cont.)</b>				
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	T/T	No	1,2
<i>Phrynosoma coronatum frontale</i>	California horned lizard	SC/CSC	No	1
<b>Amphibians</b>				
<i>Ambystoma californiense</i>	California tiger salamander	C/CSC	No	1
<i>Rana aurora draytonii</i>	California red legged frog	T/CSC	No	1
<i>Rana boylei</i>	Foothill yellow legged frog	SC/CSC	No	1
<b>Fish</b>				
<i>Hypomesus transpacificus</i>	Delta smelt	T/T	No	1
<i>Oncorhynchus kisutch</i>	Coho salmon	T/E	No	1
<i>Oncorhynchus mykiss</i> *	Central California Valley steelhead **	T/E	No	1
<i>Oncorhynchus mykiss</i> *	Central California Coast steelhead	T/E	Yes	1
<i>Oncorhynchus tshawytscha</i>	Winter run chinook salmon	E/E	No	1
<i>Pogonichthys macrolepotus</i>	Sacramento splittail	PT/CSC	No	1
<i>Spirinchus thaleichthys</i>	Longfin smelt	SC/CSC	No	1
<b>Invertebrates</b>				
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	T/--	No	1
<i>Danaus plexippus</i>	Monarch butterfly	--/--	No	2
<i>Hydrochara rickseckeri</i>	Ricksecker's scavenger beetle	SC/--	Marginal	1
<i>Tryonia imitator</i>	Mimic tryonia (California brackishwater snail)	SC/--	Marginal	2

<sup>a</sup> **Status Categories:**

Federal status determined from the USFWS letter. State status determined from *State and Federally Listed Endangered and Threatened Animals of California* (January 1999) and *Special Animals* (March 1998), prepared by DFG Natural Diversity Data Base. Codes used in table are as follows:

**E** = Endangered; **T** = Threatened; **R** = California Rare; **PT** = Proposed Threatened

**C** = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

**SC** = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

**SSC** = DFG "Species of Special Concern."

**FP** = DFG "Fully Protected"

CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere; **3** = Need more information; **4** = Plants of limited distribution.

-- = Species not state-listed.

<sup>b</sup> **Source:** 1 = From USFWS letter. 2 = From CNDDDB/ RareFind. 3 = Field observation.

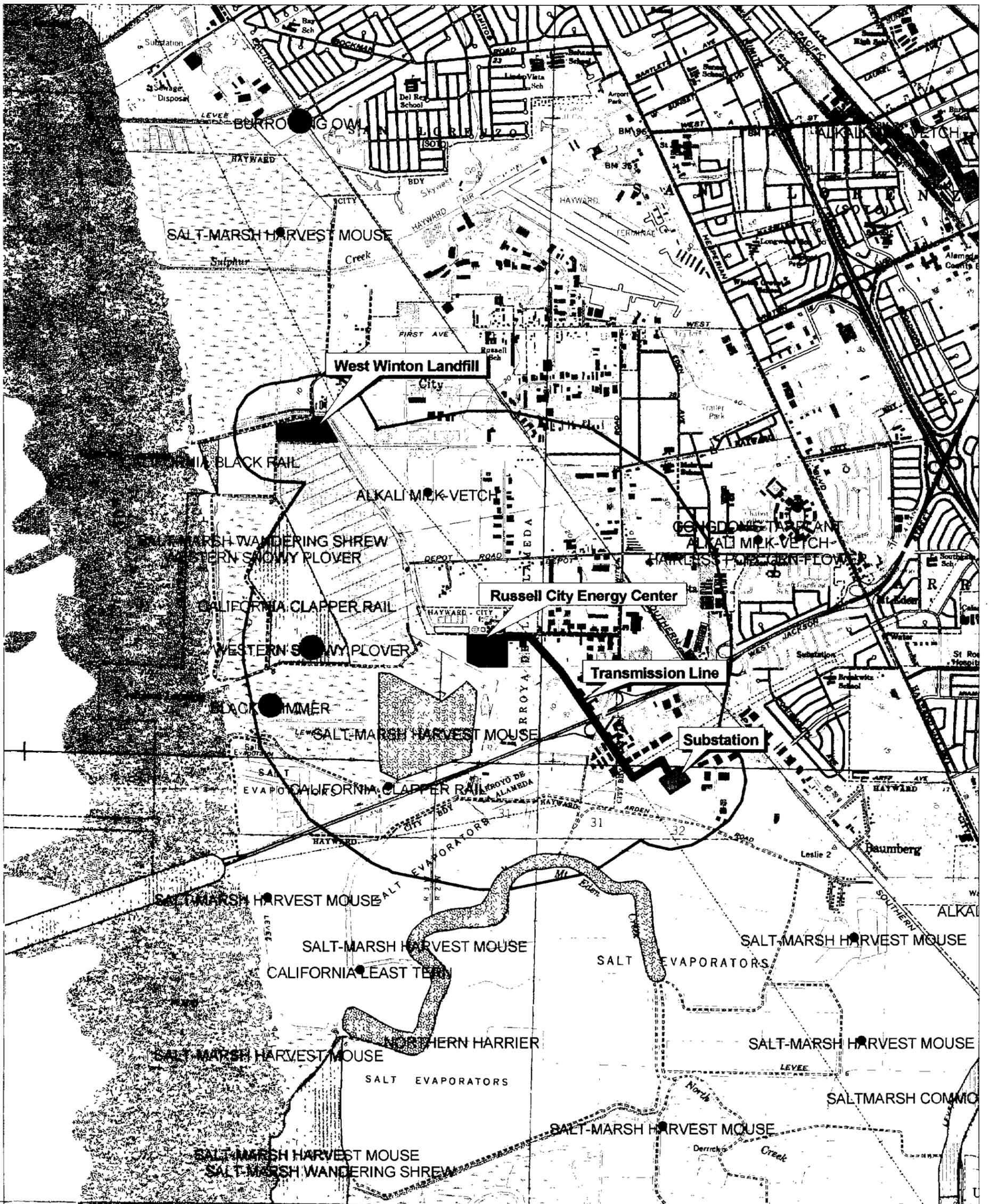
\* The *O. mykiss* taxon has an Ecological Significant Unit (ESU) designation, based on genetic isolation resulting from geographic separation.

Table 8.2-3. Plant species observed during 1999 botanical surveys for the RCEC project.

Family	Genus	Species/ subspecies/ variety	N/I	Common name	Power plant site	Old West Landfill	Winton Panhandle	Natural Gas & Water Pipelines
<b>DICOTS</b>								
Apiaceae	<i>Foeniculum</i>	<i>vulgare</i>	I	Fennel			✓	
Asteraceae	<i>Conyza</i>	<i>canadensis</i>	I	Horseweed	✓		✓	
	<i>Baccharis</i>	<i>pilularis</i>	N	Coyote brush	✓		✓	
	<i>Cotula</i>	<i>coronopifolia</i>	I	Brassbuttons	✓		✓	
Brassicaceae	<i>Grindelia</i>	<i>Stricta</i> var. <i>angustifolia</i>	N	Gumweed	✓		✓	
	<i>Sonchus</i>	<i>oleraceus</i>	I	Common sow thistle	✓		✓	✓
	<i>Brassica</i>	<i>nigra</i>	I	Black mustard	✓		✓	✓
Chenopodiaceae	<i>Chenopodium</i>	<i>album</i>	I	Lamb's quarters	✓		✓	
	<i>Salicornia</i>	<i>virginica</i>	N	Pickleweed	✓		✓	
Fabaceae	<i>Lathyrus</i>	Sp.	N	Wild pea	✓		✓	
Frankeniaceae	<i>Frankenia</i>	<i>salina</i>	N	Alkali heath	✓		✓	
Geraniaceae	<i>Geranium</i>	<i>molle</i>	I	Wild geranium	✓		✓	✓
	<i>Erodium</i>	<i>cicutarium</i>	I	Filaree	✓		✓	✓
Malvaceae	<i>Malva</i>	<i>nicaeensis</i>	I	Bull mallow	✓		✓	
Myrtaceae	<i>Eucalyptus</i>	<i>globulus</i>	I	Blue gum	✓		✓	
Papaveraceae	<i>Eschscholzia</i>	<i>californica</i>	N	California poppy	✓		✓	
Plantaginaceae	<i>Plantago</i>	<i>lanceolata</i>	I	English plantain	✓		✓	✓
Polygonaceae	<i>Rumex</i>	<i>crispus</i>	I	Curly dock	✓		✓	
Prunellaceae	<i>Anagallis</i>	<i>arvensis</i>	I	Scarlet pimpernell	✓		✓	
Solanaceae	<i>Nicotiana</i>	<i>glauca</i>	I	Tree tobacco	✓		✓	
Urticaceae	<i>Urtica</i>	<i>urens</i>	I	Dwarf nettle	✓		✓	
<b>MONOCOTS</b>								
Poaceae	<i>Avena</i>	<i>faiua</i>	I	Wild oat	✓		✓	✓
	<i>Bromus</i>	<i>dianthus</i>	I	Rippgut grass	✓		✓	
	<i>Cortadaria</i>	Sp.	I	Pampas grass	✓		✓	
Juncaceae	<i>Cynodon</i>	<i>dactylon</i>	I	Bermuda grass	✓		✓	✓
	<i>Distichlis</i>	<i>spicata</i>	N	Saligrass	✓		✓	
	<i>Elymus</i>	sp.	I	Wild-rye	✓		✓	
Juncaceae	<i>Hordeum</i>	<i>murinum</i> ssp. <i>leporium</i>	I	--	✓		✓	
	<i>Lolium</i>	<i>multiflorum</i>	I	Italian ryegrass	✓		✓	✓
	<i>Vulpia</i>	<i>microstachys</i>	N	Three-week fescue	✓		✓	
Juncaceae	<i>Scirpus</i>	sp.	Rush	✓		✓		

**Table 8.2-4. Wildlife species observed during 2001 wildlife surveys.**

Common Name	Power plant site	Old West Winton landfill panhandle	Transmission line	Natural gas pipeline
Alameda song sparrow		✓		
Barn swallow		✓		
Black-necked stilt		✓		
Brewer's blackbird		✓		
Canada goose	✓	✓		
Common raven	✓	✓	✓	
Cormorant (in flight)		✓		
Forster's tern		✓		
Killdeer	✓			
Great egret				
Least sandpiper	✓			
Long-billed dowitcher		✓		
Mallard	✓	✓		
Mourning dove	✓			
Northern harrier	✓	✓		
Red-winged blackbird	✓	✓		
Rock dove			✓	
Ruddy duck		✓		
Turkey vulture		✓		
Western Gull	✓			
Western meadowlark		✓		



**Biological Resources at the Russell City Energy Center**

**EOs as regions**

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)

- Terrestrial Community (80)
- Terrestrial Community (specific)
- Terrestrial Community (non-specific)
- Terrestrial Community (circular)
- Aquatic Community (80)
- Aquatic Community (specific)
- Aquatic Community (non-specific)
- Aquatic Community (circular)

**EOs as points**

- Plant
- Animal
- Terr. Comm
- Aqu. Comm.
- Facility Buffers



State of California

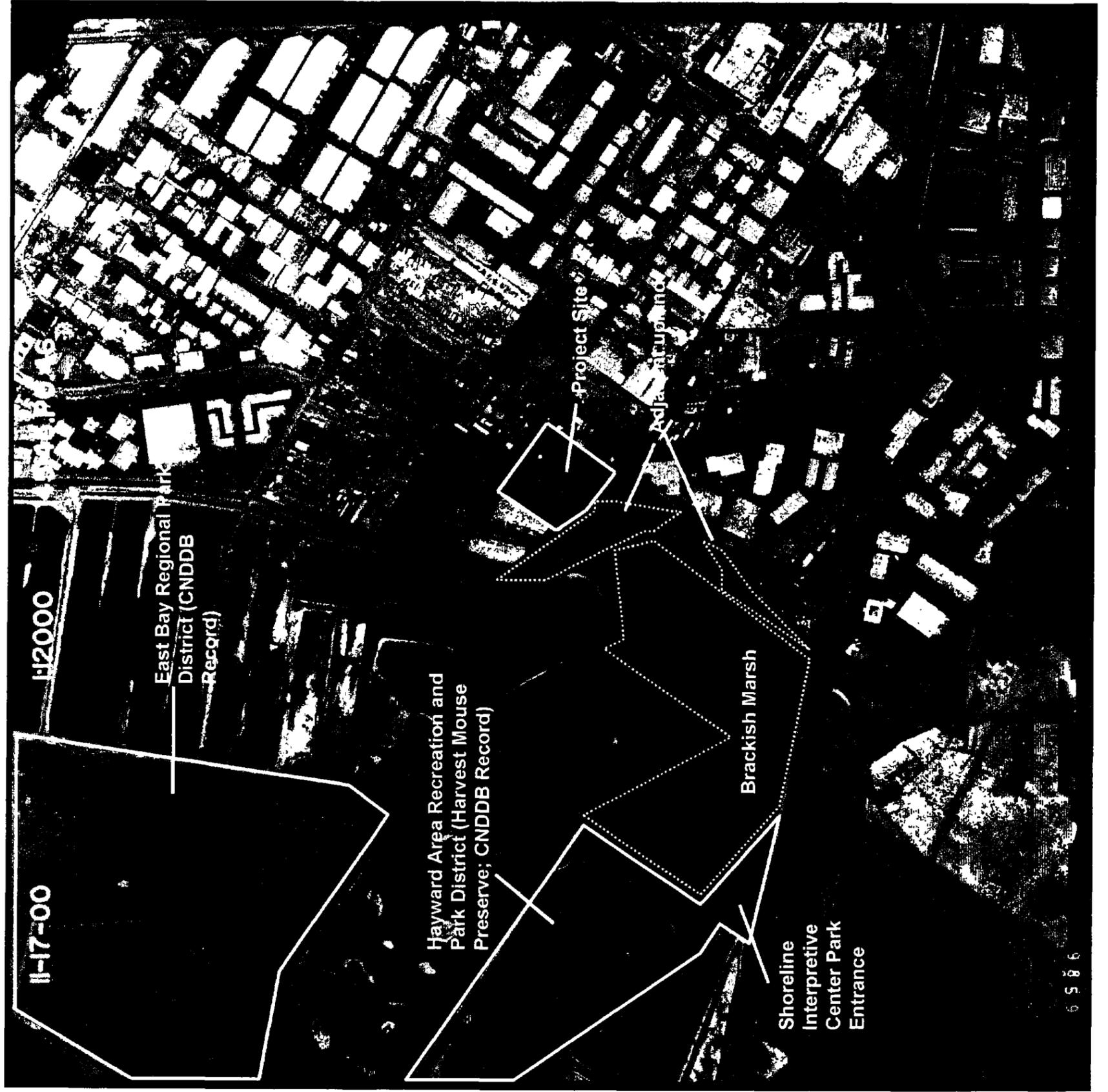


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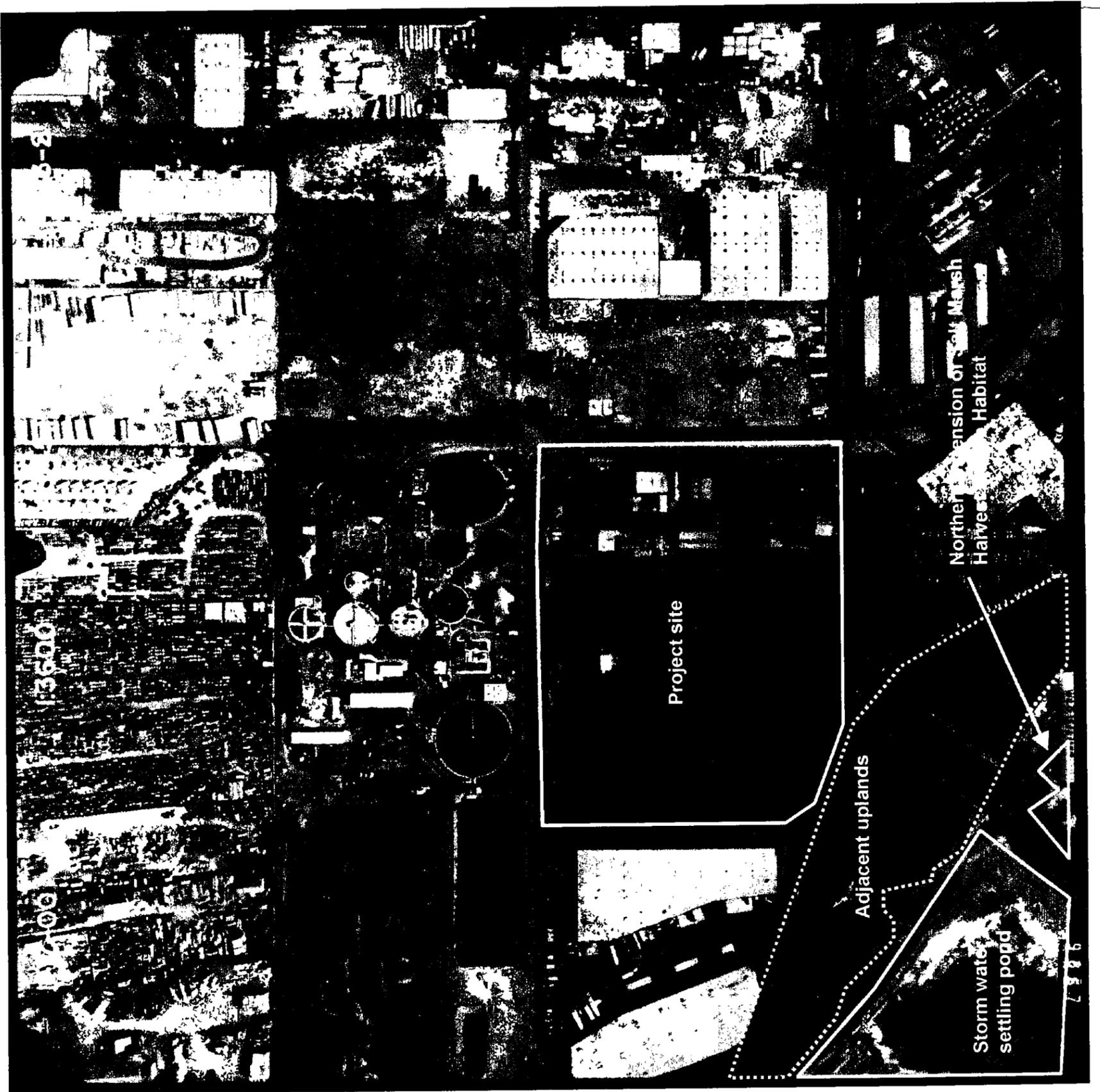
**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

Figure 2: Regional Habitat for the Salt Marsh Harvest Mouse in Relation to the Proposed Project Site



6 5 8 6

Figure 3: Salt Marsh Harvest Mouse Habitat Adjacent to the Project Site





## FOSTER WHEELER ENVIRONMENTAL CORPORATION

March 22, 2001

Mr. Don Henkins  
US Fish & Wildlife Service  
2800 Cottage Way  
Suite 2605  
Sacramento, CA  
95825

Dear Mr. Henkins,

This letter is a follow up to our conversation of March 15, 2001, in which we discussed the Application for Certification (AFC) for the Russell City Energy Center in Hayward, California. We would like to begin informal consultation regarding potential project effects on the salt marsh harvest mouse, the California least tern, and the California clapper rail.

The proposed Russell City Energy Center is a 600 MW is a natural gas-fired combined-cycle baseload merchant power plant. It will have 2 combustion turbines and 1 steam turbine. The proposed site is 3636 Enterprise Avenue, in the City of Hayward, Alameda County (Figure 1). The site is currently occupied by the KFOX radio station transmission towers. The four 224 – foot high radio transmission towers will be relocated to the Old West Winton Landfill panhandle, located on the northern end of the City of Hayward sewage treatment ponds.

The habitat at the KFOX property is dominated by annual grassland, with patches of seasonal wetland dominated by saltgrass (*Distichlis spicata*). The proposed site is located northeast of the Hayward Area Recreation District (HARD) Marsh (Figures 2 & 3), known habitat for the salt marsh harvest mouse, the California least tern, and the California clapper rail. The issues discussed in our phone conversation were:

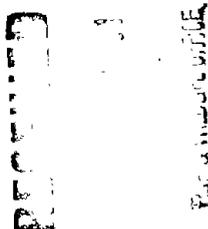
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2. The potential creation of roosting habitat for raptors on the power plant stacks. Raptors are predatory species that could impact the salt marsh harvest mouse, the California least tern, and the California clapper rail.
3. Potential bird collision and mortality associated with the relocated radio transmission towers.
4. The potential growth inducing effect of the proposed power plant.

I am currently in the process of gathering data to evaluate these issues, and will be providing this information to facilitate informal consultation. If you have any additional data needs, or if additional issues arise, please don't hesitate to contact me.

I look forward to working with you.

Sincerely,

Brett D. Hartman

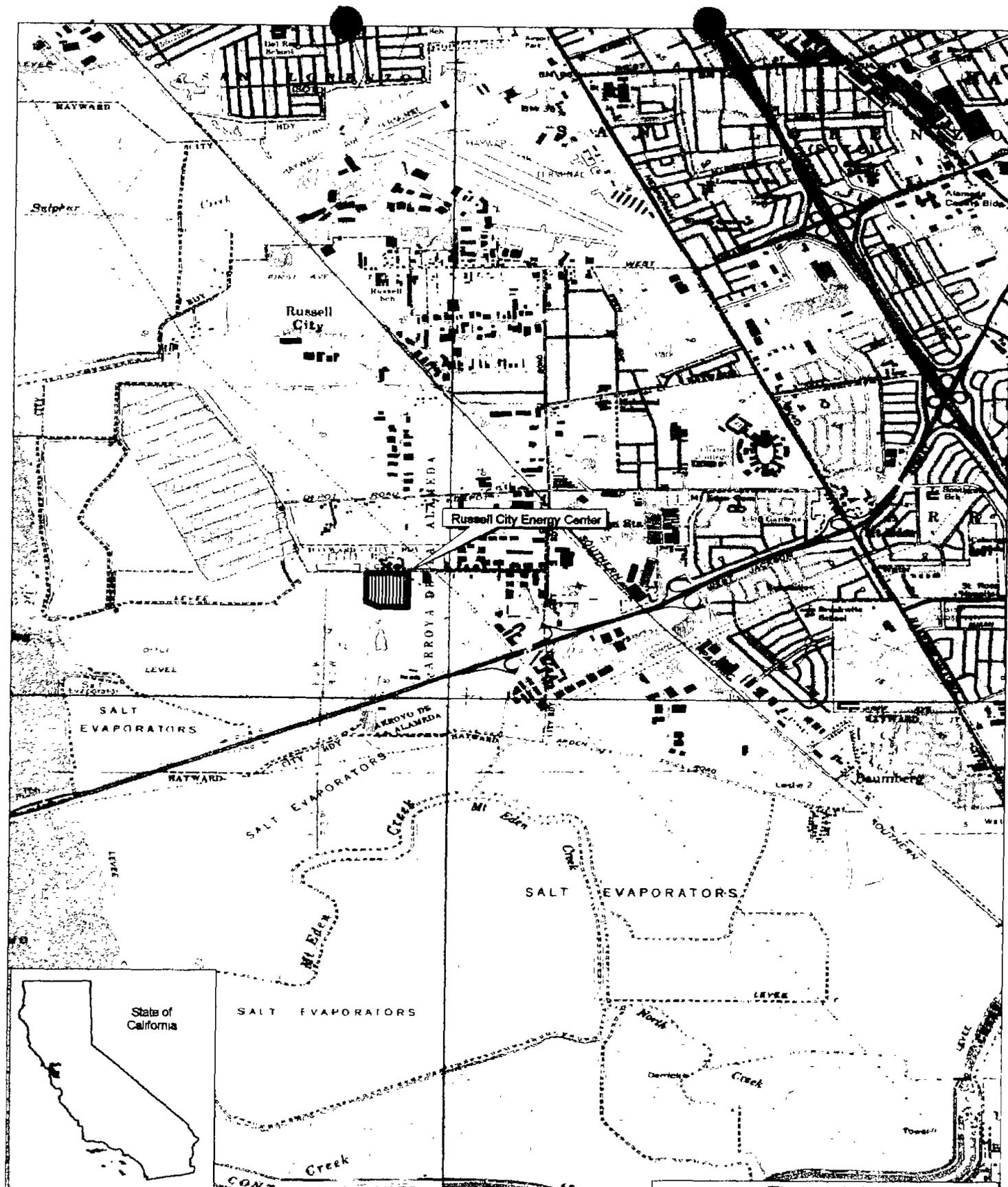


Encl: Figures 1, 2 & 3



3947 LENNANE DRIVE, SUITE 200, SACRAMENTO, CA 95834-1973  
TEL: 916-928-0202 FAX: 916-928-0594

2899 00092



State of California

Sources: Geographic Data Technology,  
Environmental Systems Research Institute,  
USGS Quad DRGs - GIS Data Depot



Figure 1.1-1  
Project Location  
Russell City Energy Center

FOSTER WHEELER ENVIRONMENTAL CORPORATION

*Gary T.*

**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION  
OF THE STATE OF CALIFORNIA**

**APPLICATION FOR CERTIFICATION FOR THE  
RUSSELL CITY ENERGY CENTER  
(RUSSELL CITY)**

**DOCKET NO. 01-AFC-7  
(AFC ACCEPTED 07/11/01)**

**NOTICE OF INFORMATIONAL HEARING AND SITE VISIT**

**I. INFORMATIONAL HEARING AND SITE VISIT**

**PLEASE TAKE NOTICE** The Committee designated to conduct proceedings on the Application for Certification for the *RUSSELL CITY ENERGY CENTER* will hold an **INFORMATIONAL HEARING** and **SITE VISIT** as follows:

**TUESDAY, AUGUST 7, 2001**

**Beginning at 5:30 pm  
City of Hayward, City Hall  
777 "B" Street  
Hayward, California 94541  
[Wheelchair accessible]**

**(Map Attached)**

AFS-FWR		AFS-FA		AFS-PC		AFS-F	
IMPL	HC	ESD	EC	CP	ADMIN		
	✓	✓					

*Gary T.  
ESD - Cant B.D.*

The Informational Hearing will convene at 5:30 p.m. and then recess to allow for a Site Visit during daylight hours. Bus transportation to the site will leave from the hearing location at 6:00 p.m. Reservations for bus transportation must be made through the Public Adviser's Office; please call (916) 654-4489 or toll-free (800) 822-6228 no later than Thursday, August 2, 2001. Following the Site Visit, the buses will return to the hearing location and the Informational Hearing will reconvene at approximately 7:15 p.m.

Landowners, members of the general public, and interested agencies are invited to attend this event or any portion of this event, and question the Applicant and Energy Commission staff concerning the project. The Energy Commission's Public Adviser, Roberta Mendonca, will be present to assist interested individuals and organizations and to provide information on participating in the Energy Commission's certification process. Ms. Mendoca may be reached at (916) 654-4489 or, (800) 822-6228 or email: [PAO@energy.state.ca.us](mailto:PAO@energy.state.ca.us)

## **Backgr und**

On May 22, 2001, Calpine Corporation and Bechtel Enterprises Holdings, Inc., known as the Calpine/Bechtel Joint Development filed an Application for Certification (AFC) with the Energy Commission seeking approval to construct and operate a 600-megawatt (MW), natural gas-fired, combined-cycle electric generating facility in the City of Hayward.

On July 11, 2001, the Energy Commission began its 6-month review of the AFC to determine whether the project will comply with all applicable laws. The Informational Hearing scheduled in this Notice is sponsored by the Energy Commission to inform the public about the project and to invite public participation in this review.

## **Project Description**

The Russell City Energy Center (RCEC) project site is located in the Industrial Corridor of the City of Hayward, Alameda County, California. The proposed 14.7-acre project site is located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility.

The proposed project consists of: two "F-Class" combustion turbine-generators; two multi-pressure, supplementary-fired heat recovery steam generators; a single, 3-pressure, reheat, condensing steam turbine-generator; and a hybrid, wet/dry plume-abated, mechanical draft cooling tower.

Related facilities include: a 230-kilovolt (kV) on-site switchyard; approximately 1.1 mile 230-kV, double-circuit, overhead transmission line (this line would connect the RCEC switchyard; to the existing Pacific Gas & Electric (PG&E) Eastshore substation via PG&E's existing Eastshore-to-Grant 115-kV transmission corridor); approximately 0.9 miles of underground natural gas pipeline that would extend from PG&E's gas distribution line 153 to the RCEC site; approximately 100 feet of new domestic water/firewater pipeline from the existing City water main under Whitesell Street; and approximately 2,000 feet of new industrial wastewater discharge pipeline.

## **Purpose of the Informational Hearing**

Licensing of the proposed RCEC and related facilities is under the Energy Commission's jurisdiction. The power plant certification process, which contains requirements equivalent to those under the California Environmental Quality Act, will examine all relevant engineering and environmental aspects of the proposed project. This process provides a public forum allowing:

- ⇒ Applicant,
- ⇒ Energy Commission Staff,
- ⇒ interested parties,
- ⇒ governmental agencies,
- ⇒ landowners, and
- ⇒ members of the general public

to consider the relative advantages and disadvantages of the project, and to propose changes or alternatives to the project as necessary.

At the Informational Hearing, any of the foregoing participants will have an opportunity to obtain information and to offer comments on the AFC. (Copies of the AFC can be obtained at your local library). Applicant will explain plans for developing the proposed site and related facilities. Energy Commission Staff will explain the administrative licensing process and their role in reviewing the application. Applicant and Energy Commission Staff will also discuss proposed schedules and possible issues that may be significant during this proceeding.

## **II. PROPOSED SCHEDULES AND ISSUE STATEMENTS**

In order to assist participants in understanding the project, Staff is directed to prepare and serve upon those listed on the Proof of Service List, an Issue Identification Report (IIR), which summarizes the potential major issues in this case no later than 5:00 p.m. on *Tuesday, July 31, 2001*. Copies of the IIR written statement may be obtained by calling Luz Manriquez-Uresti, the Project Secretary, at (916) 654-3928. The IIR will also be available on the Energy Commission's Internet home page at:  
<http://www.energy.ca.gov/sitingcases/russellcity/index.html>

In addition, Applicant and Energy Commission Staff shall file proposed schedules for the certification review. The proposed schedules must be submitted no later than *Friday, August 3, 2001*.

## **III. INFORMATION**

Members of the public may participate in all phases of the licensing process in a variety of ways. If you need information concerning public participation, please contact Roberta Mendonca, the Energy Commission's Public Adviser, at (916) 654-4489 or, toll free in California, at (800) 822-6228 or email: [PAO@energy.state.ca.us](mailto:PAO@energy.state.ca.us) Please contact Robert Sifuentes at (916) 654-5004 if you require special accommodation to participate at this meeting.

Technical questions concerning the project should be addressed to Kae Lewis, the Energy Commission's Project Manager, at (916) 654-4176 or email at: [klewis@energy.state.ca.us](mailto:klewis@energy.state.ca.us)

Questions of a legal or procedural nature should be directed to Gary Fay, the Hearing Officer, at (916) 654-3965 or email at: [gfay@energy.stat .ca.us](mailto:gfay@energy.stat.ca.us).

Media inquiries should be directed to Claudia Chandler, Assistant Executive Director for Media and Public Communications at (916) 654-4989 or email at: [energia@energy.ca.gov](mailto:energia@energy.ca.gov)

Information concerning the status of the project, as well as notices and other relevant documents, is also available on the Energy Commission's Internet home page at: <http://www.energy.ca.gov/sitingcases/russellcity/index.html>

Dated July 19, 2001, at Sacramento, California

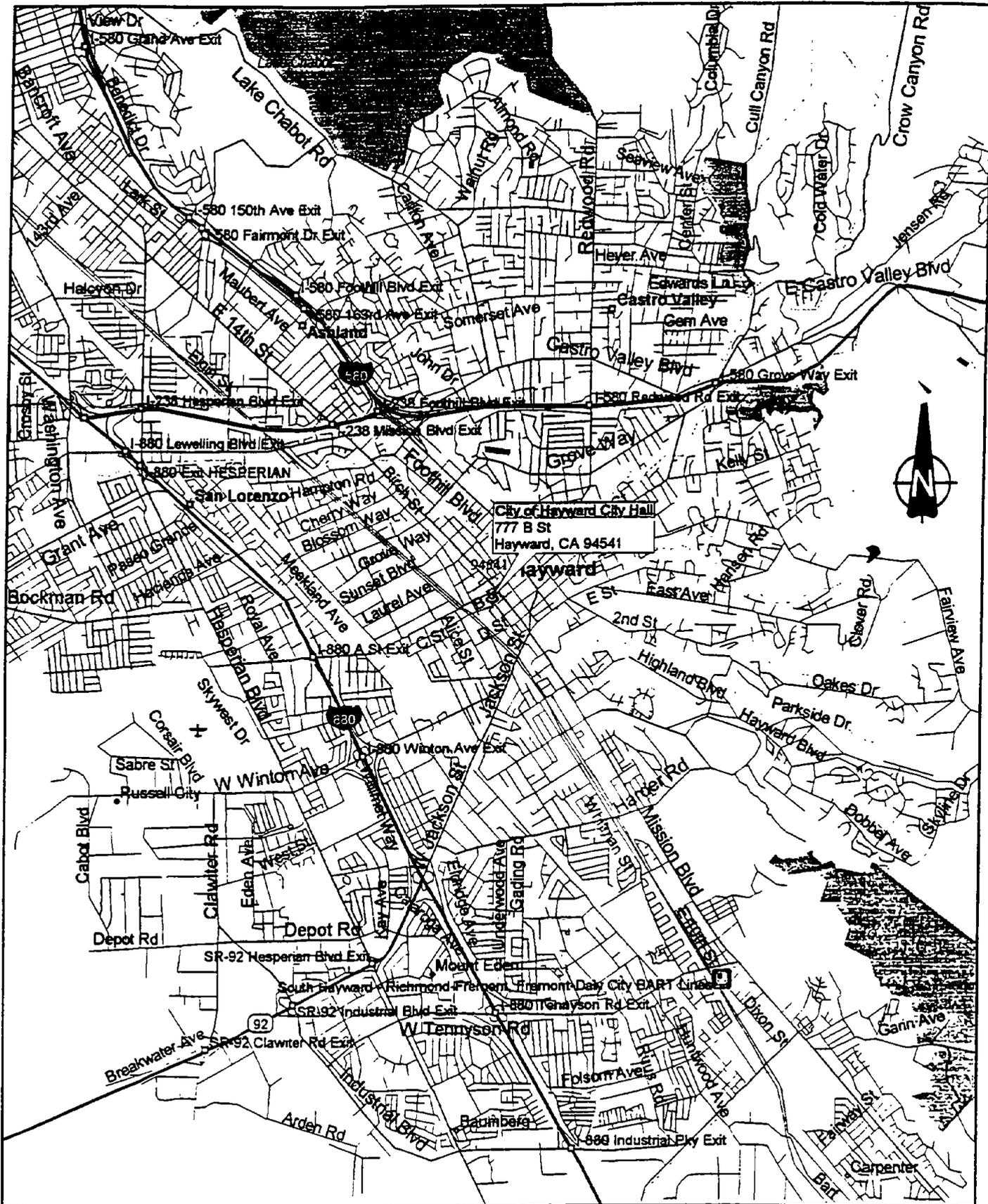


WILLIAM J. KEESE  
Chairman and Presiding Member  
Russell City AFC Committee



ROBERT PERNELL  
Commissioner and Associate Member  
Russell City AFC Committee

Proof of Service List (Revised on 7/19/01)  
filed with Original Document. Mailed from  
Sacramento on 7/19/01 BT.



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Streets98

STATE OF CALIFORNIA

Energy Resources Conservation  
and Development Commission

In the Matter of:

Application for Certification  
for the RUSSELL CITY  
ENERGY CENTER Project

Docket No. 01-AFC-7

PROOF OF SERVICE  
[\*REVISED July 19, 2001]

I, SANDRA M. HARRIS, declare that on JUNE 19, 2001, I deposited copies of the attached NOTICE OF PUBLIC INFORMATIONAL HEARING & SITE VISIT - with attached current- PROOF OF SERVICE LIST in the United States mail at Sacramento, CA with first class postage thereon fully prepaid and addressed to the following:

DOCKET UNIT

*Send the original signed document plus the required 12 copies to the address below:*

CALIFORNIA ENERGY COMMISSION  
DOCKET UNIT, MS-4  
Attn: Docket No. 01-AFC-7  
1516 Ninth Street  
Sacramento, CA 95814-5512

\* \* \* \*

In addition to the documents sent to the Commission Docket Unit, also send individual copies of any documents to:

APPLICANT

Ken Abreu  
General Manager  
Calpine/Bechtel Joint Development  
6700 Koll Center Parkway, Suite 200  
Pleasanton, CA 94566  
(925) 600-2000  
kena@calpine.com

Russell City Energy Center  
James R. Leahy  
Development Manager  
6700 Koll Center Parkway, Suite 200  
Pleasanton, CA 94566  
(925) 600-2000  
jileahy@calpine.com

Counsel for Applicant:

\*Gregg L. Wheatland, Esq.  
Ellison, Schneider & Harris L.L.P.  
Attorneys at Law  
2015 H Street  
Sacramento, CA 95814-3109  
(916) 447-2166  
glw@eslawfirm.com

\*Consultant for Calpine/Bechtel Joint Development

Andrea Grenier, Environmental  
Project Manager  
Argonaut Consulting  
7649 Sunrise Blvd., Ste. E  
Citrus Heights, CA 95610  
(916) 722-4068  
andrea@argonautconsulting.com

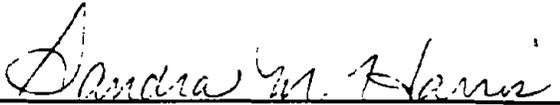
**\*Consultant for Calpin /Bechtel**

Dug Davy  
Foster Wheeler Environmental  
3427 Lennane Drive, Suite 200  
Sacramento, CA 95834  
(916) 928-4805  
ddavy@fwenc.com

**INTERESTED AGENCIES**

Bay Area Air Quality Management  
District  
Weyman Lee, PE  
939 Ellis Street  
San Francisco, CA 94109  
(415) 749-4708

I declare under penalty of perjury that the foregoing is true and correct

  
[signature]

**INTERNAL DISTRIBUTION LIST**

**FOR YOUR INFORMATION ONLY!** Parties **DO NOT** mail to the following individuals. The Energy Commission Docket Unit will internally distribute documents filed in this case to the following:

WILLIAM J. KEESE, Chairman  
Presiding Member  
MS-32

ROBERT PERNELL, Commissioner  
Associate Member  
MS-33

Gary Fay  
Hearing Officer  
MS-9

Sandra Fromm  
Project Manager  
MS-15

Dick Ratliff  
Staff Counsel  
MS-14

Jonathan Blee  
Assistant Chief Counsel  
MS-14

**PUBLIC ADVISER**

Roberta Mendonca  
Public Adviser's Office  
1516 Ninth Street, MS-12  
Sacramento, CA 95814  
[pao@energy.state.ca.us](mailto:pao@energy.state.ca.us)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

AB 1/22  
Dan

RECEIVED

DEC 5 2001

SACRAMENTO  
FISH & WILDLIFE OFFICE

December 19, 2001

Ellen Garvey  
Air Pollution Control Officer  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, CA 94109

**Re: Preliminary Determination of Compliance for the Russell City Energy Center (#2896)**

Dear Ms. Garvey:

I am writing to you in reference to the District's preliminary Determination of Compliance for the Russell City Energy Center (RCEC), a proposed 600 MW combined cycle combustion turbine electricity generation facility. EPA is concerned about the proposed Best Available Control Technology (BACT) determinations for oxides of nitrogen (NO<sub>x</sub>) and carbon monoxide (CO). We are also concerned that the proposed offset package may not be surplus, since the precursor organic compound (POC) emission reduction credits (ERCs) are pre-1990 reductions, and both the POC and NO<sub>x</sub> ERCs do not appear to be adjusted to reflect current federal requirements. Our concerns are explained in detail in the enclosure.

Additionally, under federal PSD delegation requirements, EPA retains responsibility to ensure compliance with Section 7 of the Endangered Species Act (ESA). We have been in contact with the U.S. Army Corp of Engineers and the U.S. Fish and Wildlife Service (FWS) concerning our role as lead federal agency in the ESA consultation process. Therefore, the final PSD permit shall not be issued until this office has notified the District that the ESA process, including consultation with FWS, is complete.

We look forward to working with you to address our comments on the proposed BACT determinations prior to the issuance of the final Determination of Compliance. Please contact Todd Marse of my staff at (415) 972-3976 if you have any questions.

Sincerely,

  
for  Gerardo C. Rios  
Chief, Permits Office

Enclosure

cc: James R. Leahy, Russell City Energy Center  
Kae Lewis, California Energy Commission  
Mike Tollstrup, California Air Resources Board  
Jan C. Knight, U.S. Fish and Wildlife Service

## U.S. EPA Comments on RCEC Preliminary Determination of Compliance

### *1. Best Available Control Technology (BACT) for Nitrogen Oxides (NO<sub>x</sub>)*

The District has proposed a BACT rate of 2.5 ppm averaged over one-hour, rather than 2.0 ppm averaged over one-hour. EPA requests that prior to issuing the permit, the District evaluate NO<sub>x</sub> BACT of no more than 2.0 ppmvd, corrected to 15 percent O<sub>2</sub>, averaged over one-hour. Recently, several non-attainment area NSR permits were issued for combined cycle gas fired turbines capable of achieving a NO<sub>x</sub> emission rate of 2.0 ppm, corrected to 15 percent O<sub>2</sub>, averaged over one-hour (Lowest Achievable Emission Rate, LAER). [Refer to Massachusetts Department of Environmental Protection (MDEP)/Region 1 PSD permits.] Your analysis should include a discussion of these (and other) permitting actions which required the lower NO<sub>x</sub> emission rate.

### *2. BACT for Carbon Monoxide (CO)*

As indicated in the PDOC, "The gas turbines and HRSG duct burners each trigger BACT for CO emissions...Furthermore, the HRSGs and (sic) will be designed and constructed such that an oxidation catalyst can be readily installed if necessary to achieve compliance with CO emission limitations. The gas turbine and HRSG duct burner combined exhaust will achieve a CO emission limit of 6 ppmvd @ 15% O<sub>2</sub>" (p. 7, PDOC, 11/19/01). Recent CO BACT analyses in EPA Region 1 identify CO oxidation catalysts and SCONOX as technically feasible control technologies that could attain up to 90% removal efficiency, and would be capable of achieving a CO emission rate of 2.0 ppmvd, corrected to 15 percent O<sub>2</sub>, averaged over one-hour. (Refer to MDEP Permits.) As such, the two options should be considered the top-ranking alternatives and equal in control effectiveness.

Therefore, EPA requests that the District consider a BACT limit of 2.0 ppmvd CO, corrected to 15 percent O<sub>2</sub>, averaged over one-hour. An oxidation catalyst typically can achieve this CO emission rate and would also reduce POC and hazardous air pollutant (HAP) emissions, effectively mitigating residual toxic risk impacts to human health and nearby endangered species. (See Section 4 on endangered species.) Of course, with any BACT analysis, please include a discussion on each technologies' energy, environmental, and economic impacts.

### *3. Proposed offsets for Precursor Organic Compounds (POCs)*

The certification date of the emission reduction credits (ERCs) proposed to offset the project's 28.5 tons/yr of POC emissions pre-date the 1990 amendments to the Clean Air Act (CAA). Therefore, if the proposed ERCs are not explicitly included in the District's EPA-approved ozone attainment plan emissions inventory as existing emissions or future emissions growth, the inventory must be amended before the District may grant the PSD permit. EPA is concerned that the District has not accounted for the pre-1990 shutdown credits in the current approved plan as new source growth. We are also concerned that the ERCs have not been incorporated in any modeling exercise used to demonstrate attainment. As you may know, EPA

has been working with CARB, BAAQMD, and other non-attainment area Districts in California on how districts must account for pre-1990 ERC before they can be used.

Please be reminded that any ERCs submitted for offsetting purposes must be surplus from CAA requirements at the time of use. Consequently, EPA requests that an analysis be included in the final DOC that demonstrates the credibility of the proposed ERCs.

#### *4. Endangered Species*

Pursuant to Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, and its implementing regulations at 50 C.F.R. Part 402, EPA is required to ensure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. EPA has determined that this delegated PSD permitting action triggers ESA Section 7 consultation requirements. EPA is therefore required to consult with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) if an endangered species or threatened species may be present in the area affected by the permit project and EPA's action (i.e., permit issuance) may affect such species. EPA is also required to confer with the Services on any action which is likely to jeopardize the continued existence of any species proposed for listing (as endangered or threatened) or result in the destruction or adverse modification of habitat proposed to be designated as critical for such species.

The District may proceed with final PSD permit issuance upon conclusion of ESA consultation, EPA review of FWS's Biological Opinion, and our determination that issuance of the PSD permit will be consistent with the ESA requirements.



FS/DFS	ADMIN	CVPIA	EC	ESD	HC	WR
Tree Dis.						
FILE						

LSA Associates, Inc.

Environmental Analysis  
 Transportation Engineering  
 Biology and Wetlands  
 Habitat Restoration  
 Resource Management  
 Community and Land Planning  
 Landscape Architecture  
 Archaeology and Paleontology

June 11, 1998

*Principals*

- Rob Balen
- Sheila Brady
- Les Card
- David Clore
- Steve Granholm
- Richard Harlacher
- Roger Harris
- Art Homrighausen
- Larry Kennings
- Carollyn Lobell
- Bill Mayer
- Rob McCann
- Rob Schonholtz
- Malcolm J. Sprout

*Associates*

- Deborah Baer
- James Baum
- Connie Calica
- Steven W. Conkling
- Ross Dobberteen
- Gary Dow
- Richard Erickson
- Kevin Fincher
- Clint Kellner
- Laura Lafler
- Benson Lee
- Judith H. Malamut
- Sabrina Nicholls
- M. W. "Bill" O'Connell
- Anthony Petros
- Lynette Stanchina
- Jill Wilson
- Lloyd B. Zola

Dan Bufford  
 Endangered Species Division  
 U.S. Fish and Wildlife Service  
 3310 El Camino Avenue, Suite 130  
 Sacramento, CA 95821

Subject: Pacific Shores Center, Corps File No. 16783S41, Amendment 2

Dear Dan:

As requested in our telephone conversation of June 11, the following additional conditions will be added to clarify and amend the February 1998 Mitigation and Monitoring Plan for the above referenced project. These issues address your request for leash requirements for dogs, mitigation for reduced project buffer, and acceptable landscaping trees.

**Section 4.2.1 Buffer Zones and Screening (page 4-3 to 4-5).** Appropriate language and/or additional signs will be added to the public access trail to remind trail and other open space users of leash requirements for dogs within open space areas.

**Section 4.2.1 Buffer Zones and Screening (page 4-3 to 4-5) and Section 4.1 Goal of Mitigation (Page 4-2 and 4-3).** As was discussed in our June 8, 1998 letter, we were only able to practicably provide an 85-foot buffer/setback between the trail and the adjacent salt ponds. The 15-foot difference between the available buffer and the requested 100-foot wide setback equates to approximately 1 acre. As mitigation for the reduced buffer, the applicant will provide 22 acres of compensatory wetland restoration as proposed in the mitigation plan. The additional 1 acre of mitigation is included within the proposed 22 acres and balances the impact and mitigation requirements resulting from the ratio calculation error on page 4-3. The revised calculation on page 4-2 and 4-3 will now read:

*A 2:1 ratio is proposed for the fill/loss of 7.1 acres of potentially suitable salt marsh harvest mouse habitat (14.2 acres) and 1: 1 replacement is proposed for the 6.8 acres of the highly degraded wetlands Seaport Boulevard, the roadside ditch, the four outfall locations on non-native soil /fill material on the development site (6.8 acres), and the approximately 1 acre*

06/28/98(H:\STEVE\FILES\PSC830\BUFFORD4)

157 Park Place  
 Pt. Richmond, California 94801

Telephone 510 236-6810  
 Facsimile 510 236-3480  
 E-mail lsa2@ix.netcom.com

Other offices located in Berkeley  
 Irvine, Riverside and Sacramento

of land within the reduced width perimeter buffer between the site and adjacent salt ponds (1 acre)(22 acres total).

**Section 4.4.2 Project Landscaping (pages 4-4 to 4-9).**

Only high landscape suitability trees will be used for project landscaping. The following trees on the initial plant palette landscaping suitability index meet the Service's criteria based on your facsimile of June 11, 1998:

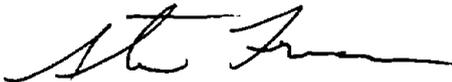
<i>Acacia baileyana</i>	<i>Cercis occidentalis</i>	<i>Crataegus phaenopyrum</i>
<i>Feijoa sellowiana</i>	<i>Geijera parviflora</i>	<i>Melaleuca nesophila</i>
<i>Schinus terebinthifolius</i>	<i>Cycas revoluta</i>	

As we discussed, some of the Service's suitability changes were in response several apparent discrepancies in tree height between our source, *The Western Garden Book* and your source, *Hortis Third*. Herma Lichtenstein, the project landscape architect, indicated that *Hortis Third* provides information on tree height and growth under ideal conditions (i.e., in the tree's natural habitat/climate). *The Western Garden Book* on the other hand addresses the height and growth form on what is more normal for this region. Actual tree heights will likely be lower at the project site given the local wind and salt spray conditions at this site.

I believe this addresses the items we discussed. If you have any questions or wish to discuss other measures to address the setback issue, please feel free to contact me.

Sincerely,

LSA ASSOCIATES, INC.



Steve Foreman  
Project Manager/Wildlife Biologist

cc Peter Brandon  
John Sanger  
Mark D'Avignon



FS/DFS	ADMIN	EC	ESD	FILE	WR
FILE					

LSA Associates, Inc.  
 Environmental Analysis  
 Transportation Engineering  
 Biology and Wetlands  
 Habitat Restoration  
 Resource Management  
 Community and Land Planning  
 Landscape Architecture  
 Archaeology and Paleontology

April 28, 1998

*Principals*

- Rob Balen
- Sheila Brady
- Les Card
- David Clore
- Steve Granholm
- Richard Harlacher
- Roger Harris
- Art Homrighausen
- Larry Kennings
- Carolyn Lobell
- Bill Mayer
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- Lynette Stanchina
- Jill Wilson
- Lloyd B. Zola

Dan Bufford  
 Endangered Species Division  
 U.S. Fish and Wildlife Service  
 3310 El Camino Avenue, Suite 130  
 Sacramento, CA 95821

MAY 01 1998

Subject: Pacific Shores Center, Corps File No. 16783S41

Dear Dan:

Enclosed is the preliminary tree species plant palette for the Pacific Shores Center Project for your review. The plant list was initially supplied by Merrill and Befu, the project's landscape architectural firm. We have analyzed the list with respect to the landscaping suitability criteria described in Section 4.2.2 on pages 4-7 to 4-9 of the February 1988 Mitigation and Monitoring Plan. As described in the mitigation and monitoring plan, only trees falling into the moderate to high suitability index values would be used for project landscaping. High index value trees would be used for general landscaping. Moderate suitability trees would be used in specific locations such as the screening barrier on the western edge of the site where taller trees are required as mitigation for other environmental affects.

The applicant has also proposed to fund regular monitoring and to implement control measures to eliminate specific problems should such conditions arise in the future (see Section 4.2.3, pages 4-9 to 4-10 of the plan). If you have any questions or require additional information, please feel free to contact me.

Sincerely,

LSA ASSOCIATES, INC.

Steve Foreman  
 Project Manager/Wildlife Biologist

Enclosure

04/28/98(H:\STEVE\FILES\PSC\BUFFORD1)

157 Park Place  
 Pt. Richmond, California 94801

Telephone 510 236-6810  
 Facsimile 510 236-3480  
 E-mail lsa2@ix.netcom.com

Other offices located in Berkeley  
 Irvine, Riverside and Sacramento

Pacific Shores Center  
 Suitability Analysis for Preliminary Landscape Palette  
 Relative to Minimizing Raptor and Raven Nesting Suitability

Tree Species	Tree Characteristics <sup>1</sup>	Landscaping Suitability Index <sup>2</sup>
<i>Acacia baileyana</i> Bailey acacia	20-30 feet; round form; closed dense crown	High
<i>Casuarina stricta</i> Drooping she-oak	20-35 feet, oval to dome shaped crown, upright fine branches	Moderate to High
<i>Casuarina cunninghamiana</i> River she-oak	to 70 feet; oval to dome shaped crown; crown with large branches and openings	Low
<i>Cedrus deodara</i> Deodar cedar	to 80 feet; pyramidal crown, large horizontal limbs	Very Poor
<i>Cercis occidentalis</i> Western redbud	10 to 18 feet; irregular crown; small upright limbs	High
<i>Cornus nuttallii</i> Western dogwood	to 50 feet; irregular crown; small limb structure; some openings in canopy at maturity	Moderate
<i>Cornus florida</i> Eastern dogwood	to 20 feet; irregular shape with fine horizontal branches <i>to 40'</i>	High
<i>Crataegus phaenopyrum</i> Washington hawthorn	to 25 feet; fine limb structure, spreading crown	High
<i>Cupaniopsis anacardioides</i> Carrot wood	to 40 feet; dome shaped form	Moderate
<i>Cupressus arizonica (glabra) pyramidalis</i> Arizona cypress	to 40 feet; oval, dense compact crown	High to Moderate
<i>Cupressus sempervirens</i> Italian cypress	to 60 feet; dense, narrow columnar form; upright fine branches <i>to 80'</i>	High
<i>Eucalyptus citriodora</i> lemon-scented gum	75 - 100 feet; irregular, open crown	Very Poor
<i>Eucalyptus ficifolia</i> Red flowering gum	to 40 feet; round-headed tree; compact crown	Moderate
<i>Feijoa sellowiana</i> Pineapple guava	18 to 25 feet; round to spreading form; dense crown	High
<i>Fraxinus ornus "Raywood"</i> Raywood ash	25 to 35 feet; compact, round headed crown; generally small narrow limbs <i>to 60'</i>	High
<i>Geijera parviflora</i> Australian willow	25 to 30 feet; dome shaped crown, with small upswept branches	High
<i>Gleditsia triacanthos</i> Moraine locust	35 to 70 feet; spreading, arching branches; open crown	Poor to Low
<i>Koelreuteria paniculata</i> Goldenrain tree	20 to 35 feet; spreading form with open branching crown	Low to Moderate
<i>Laurus nobilis</i> Sweet bay	12 to 40 feet; compact, broad-based, multistemmed cone-shaped crown	High

Tree Species	Tree Characteristics <sup>1</sup>	Landscaping Suitability Index <sup>2</sup>
<i>Liquidambar formosa</i> Sweet gum	to 25 feet; generally dense cone to pyramidal shaped crown <i>to 120'</i>	High
<i>Lyonothamnus floribundus</i> Catalina ironwood	30 to 60 feet; 20 to 40 foot dome-shaped spread	Moderate
<i>Melaleuca neophila</i> Pink melaleuca <i>neosephila</i>	15 to 20 feet, occasionally 30 feet; irregular to round dense crown; can develop heavy gnarled branches if unpruned; branches generally upright	High
<i>Melaleuca quinquenervia</i> Cajeput tree	20 to 40 feet; upright, open dome to round crown	Moderate to Low
<i>Nyssa sylvatica</i> Sour gum	30 to 50 feet, pyramidal when young to spreading at maturity; short horizontal branches	Poor
<i>Olea europea</i> European olive	25 to 30 feet; vase shaped;	Moderate to High
<i>Pinus canariensis</i> Canary island pine	60 to 80 feet; pyramidal when young to round crown at maturity; large open branches	Poor
<i>Pittosporum crassifolium</i>	to 25 feet; dense dome to round crown <i>to 35'</i>	High
<i>Podocarpus gracilior</i> Fern pine	to 60 feet; oval crown with heavy dense foliage	Low to Poor
<i>Populus nigra</i> Lombardy poplar	40 to 100 feet; dense columnar shape with upward reaching branches	Poor to Very Poor
<i>Pyrus calleryana</i> Bradford pear	25 to 50 feet; dense, round crown; horizontal branches	Moderate
<i>Quercus agrifolia</i> Coast live oak	20 to 70 feet, open round to spreading crown; large horizontal branches	Poor
<i>Schinus terebinthifolius</i> Pepper tree	to 30 feet; broad, umbrella-shaped crown; dense foliage	High
<i>Ulmus parvifolia</i> Chinese evergreen elm	40 to 60 feet; spreading with long, arching to weeping branches	Moderate to High
<i>Umbellularia californica</i> California bay	20 to 25 feet in cultivation; dense foliage	Moderate to High (if kept low)
<i>Cycas revoluta</i> Sago palm	<i>trunk</i> to 10 feet	High
<i>Syngus (Arecastrum) romanzoffianum</i> Queen palm	to 50 feet; dense growth of feather-type fronds	Moderate
<i>Washingtonia robusta</i> Mexican fan palm	to 100 feet	Moderate to Poor

---

<sup>1</sup> **Source:** Sunset Western Garden Book. 1988. Lane Publishing Co., Menlo Park, California

<sup>2</sup> **Landscaping Suitability Index**

Trees must possess at least two of the specified characteristics in order to fall within a designated index value. All characteristics refer to trees at maturity. Trees with high landscaping suitability have low potential for raptor and raven nesting and roosting where as trees with poor or very poor landscaping index values have high potential for raven and raptor nesting and roosting.

**High:** 20 to 25 feet or less in height; columnar shape; preponderance of fine limbs; or closed dense crown structure.

**Moderate:** 25 to 50 feet in height; moderate arch in limb structure; or crown with openings consisting of 20 percent on the crown area.

**Low:** 50 to 70 feet in height; fairly horizontal limbs structure; limbs 3 to 5 inches in diameter at trunk; or crown openings of 20 to 30 percent.

**Poor:** 50 to 70 feet in height; fairly horizontal limb structure; limbs > 8 inches in diameter at trunk at > 50 feet in height; or 50 percent crown area open.

**Very Poor:** >70 feet in height; horizontal limb structure; limbs > 8 inches in diameter at trunk at > 50 feet in height; crown structure > 50 percent open; or good potential for sentinel perches > 70 feet high from nearby trees.

4/30/07

600 megawatt  $\Rightarrow$  600,000 people in Alameda and San Mateo Counties.

$\rightarrow$  90%  $\downarrow$  in emissions

- Recycled water will be used for the project where does this come from?
- How many Tons of N will be produced daily?
- Where in Alameda co. will energy go.
- Similar to Metcalf.
- Substation adjacent to Baumberg w/in existing substation.
- < 2 ac. Seasonal Wetlands  $\rightarrow$  jurisdiction  $\rightarrow$  salt grass and other salt tolerant/non-native species.

Sumps will be used to treat / process used recycled water.

4/30/01

RUSSELL CITY ENERGY PROJECT

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USFWS

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don\_hankins@fws.gov

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CALPINE/BEARZ

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Andrea Grenier

CEC

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andrea@argonautconsulting.com

722-4288 Andrea → Fax #'s to send plant  
928 0594 Bret Palat

9/7/01 teleconference RUSSELL CITY

- Stuart Hoga, Bret Hartman, Doug [?] Davey, Andrea Grenier, Dean Carrier  
Rick York, Tim Brown

- Stuart → when ~~will~~ BA be completed ... landscaping plan + Study  
of effectiveness of perch deterrents + contingency plan (control program) → wildlife  
services)

Dean  
Carrier

- Santa Cruz Predatory Bird Research Group (Brian Walton)

↳ Does not increase vulnerability of species by structures

↳ wants to see data proving there is an issue.

↳ issues w/ our plant request

All veg. is considered nesting/roosting

↳ is the height negotiable for veg.? yes depends on location of  
respect to development.

- Monitor plan for effectiveness of perch deterrents (do we have one?)  
↳ they will develop a study

- Habitat compensation negotiations underway, some alternatives are being looked into.

- Effluent Discharge → will be e-mailed to Stuart

↳ into EBDA pipeline → 7.5 mi offshore

↳ additional info to come

↳ actually reduces quantity of freshwater into bay, Temp does not ↑

EBDA ⇒ 13.3 mgd

↳ 2.26 mgd evaporated via Russell City

60-70° F effluent (roughly same as existing... more  
info coming).

↳ 0.066 back into Hayward.

#'s will be submitted.

- Substation + Transmission lines

↳ 6 Towers Tubular

↳ substations ~~are~~ in open space area?

↳ average impacts unknown

- Storm water mgmt. Plan will be drafted in concert w/ HARD and EBRPD

- Noise → 106 dBA as distance doubles dB ↓ by 6 dB

- Bird flight diverters on ground waters

Roll Call 11/9/01

- Attendance @ hearing needed → TBA January

- Support

- Hab. Comp.

- HARD MARSH 3 what is compensation

- Federal

- Monitor Perch Detriments

↳ monitoring of detriments i.e. maintenance

- e-mail discussion points to me. I will reiterate in letter of support to CEC.

- Tower movement is still being analyzed.

- Noise - coast + steam blow

↳ Stuart will get one additional info.

12/12/01 RUSSELL CITY

Rebo Smith @ Corps OK w/ concept

EB Parks → likely long term manager.

~28 acres - no tidal influence. - need upland refugia

- adjacent to SMHM preserve

- Seasonal pond → vernal flooding - EB Parks desires these

- VPFS → request Salinity + PH

- Look into recovery plan

- Consultation requirements

- could EB Parks consult on their own

- what is best way to go.

- Noise

↳ need to see their reduction plan.

- Veg plan

Hayward requests

- Myoporum

- Cassin's Wren

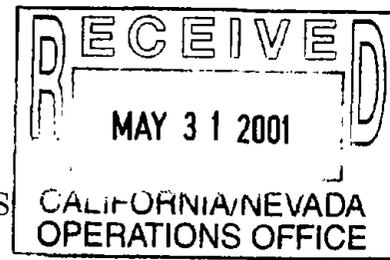
- Calif. Bay

- Ariz. Cypress

- Ca. pepper



CALPINE/BECHTEL POWER PLANT AND RELOCATION OF RADIO TRANSMISSION FACILITIES



NOTICE OF PUBLIC HEARINGS

Wayne

On Thursday, June 28, 2001, at 7:30 p.m., the Planning Commission of the City of Hayward will consider a request by Calpine/Bechtel Joint Development to make a determination that the construction of a power plant at 3636 Enterprise Avenue and the relocation of radio transmitter facilities is in compliance with City laws, ordinances, regulations and standards. As part of that undertaking, Golden Gate Broadcasting Company is seeking approval of a use permit (No. 01-160-11) to relocate its radio transmitter facilities from 3636 Enterprise Avenue to City-owned property near the western terminus of West Winton Avenue on a former landfill site. The meeting will be held in the Council Chambers, 2nd floor, City Hall, 777 B Street, Hayward, California, to obtain citizen input on the requests. The Planning Commission's action will constitute a recommendation to the City Council.

On Tuesday, July 10, 2001, at 8:00 p.m. the City Council of the City of Hayward will review the above-cited issues, taking into consideration the recommendation of the Planning Commission and input from the public.

As part of the review process, a mitigated negative declaration was prepared, which indicates that relocating the radio transmitter facilities will not have a significant impact on the environment provided that specified mitigation measures are incorporated into the project. The Planning Commission and the City Council will be considering the merits of this document. The environmental documents are on file at the City Hall, the Main Library, and at the Weekes Branch Library.

The public is invited to review and comment on the environmental documents and to speak or offer written evidence in support of or against the environmental documents, the use permit for the relocation of the radio transmitter facilities, and the request for compliance with City laws, ordinances, regulations and standards.

For questions or comments on these projects, please contact:

Dyana Anderly, AICP
Planning Manager
777 B Street
Hayward, CA 94541
Phone No. (510) 583-4214, Fax No. (510) 583-3649

Handwritten tracking form with grid and signatures. Grid includes columns for FS, OPS, AFS, S-EA, AFS-HC, AFS-ES, IMPL, CP, ADMIN. Includes handwritten signatures and dates like '6/22'.



Calpine Corporation



Bechtel Enterprises Holdings, Inc.

## **QUESTIONS AND ANSWERS:**

### **ABOUT THE RUSSELL CITY ENERGY CENTER**

#### **What is the Russell City Energy Center?**

The Russell City Energy Center is a proposed 600-megawatt combined-cycle electric generating facility that will bring much-needed energy capacity to Alameda and San Mateo counties. The facility will provide enough electricity for 600,000 people. The Energy Center, which will use natural gas for fuel, will allow for a greater than 90 percent reduction of emissions and will be 40 percent more fuel efficient than older, fossil-fueled generating facilities in the Bay Area.

#### **Where Will the Russell City Energy Center be Located?**

The Russell City Energy Center will be located on approximately 14 acres, zoned heavy industrial, at 3636 Enterprise Avenue in Hayward. The site is adjacent to the City of Hayward's wastewater treatment plant which will supply recycled water to the Energy Center.

#### **Who Is The Sponsor of this Project?**

San Jose-based Calpine Corporation and San Francisco-based Bechtel Enterprises Holdings, Inc. are the sponsors of the Russell City Energy Center. Calpine Corporation is a leading national power company that currently has 26,800 megawatts of energy capacity in operation, under construction or in development in 27 states. Calpine generates electricity using two proven and environmentally friendly technologies—natural gas combined-cycle and geothermal. Founded in 1984, Calpine is publicly traded on the New York Stock Exchange under the symbol CPN.

Bechtel Enterprises Holdings, Inc. is the development, financing and ownership affiliate of the Bechtel organization, a global engineering and construction firm. Bechtel has been at the center of energy development since the 1940s, having built more than 450 power stations with a total generating capacity exceeding 250,000 megawatts. Through

its power development affiliate, InterGen, and its own portfolio, Bechtel Enterprises also has more than 17,600 megawatts of energy capacity in operations, under construction, or in advanced development around the world.

### **Why Is a New Generating Facility Needed?**

In the summer of 2000, Californians began to experience the severe energy shortages now facing our state. Lack of adequate electrical resources have led to brown-outs and black-outs locally and sent electrical bills skyrocketing. Supply shortages have now continued into the winter months, making California's need for new reliable energy resources even more urgent. New electric generating facilities—located near where the power is needed—will help insulate residents and businesses in our area from the disruption and expense of inadequate electrical supplies.

### **What Is Causing Power Shortages in the Area?**

No major new generating facilities have been built in the Bay Area since the early 1970's, while the population has grown by over 50%. California depends on importing 20% of its electricity from other states and these imports are becoming unreliable as their own economies and electrical needs continue to grow.

The enormous growth of the Internet is also contributing to our energy shortages. Millions of computers, displays, printers and the widespread use of email for commerce contribute to hundreds of megawatts of new energy demand each year. And, additional household appliances and electronics demand more and more power. From the simplest digital clocks to complex "smart chips," California households and businesses now have dozens of devices that operate continuously, drawing electric power 24 hours a day, seven days a week. The Russell City Energy Center will help solve the supply problem facing consumers and businesses by providing clean, affordable and efficient new generating capacity.

### **Why Can't Conservation or Alternative Power Sources Remedy Our Power Shortages?**

A multi-faceted solution, including conservation, renewable power sources and new generating facilities such as Russell City will be required to solve our energy problems.

Conservation alone is not the answer because the amount of energy that can be conserved is limited and our energy needs continue to grow.

Renewable power sources such as wind and solar are used in some parts of the state but do not provide a constant and reliable energy source. In addition, expanding these alternative power sources would require the use of thousands of acres of land, raising a number of other environmental considerations.

## **What Makes This a Good Site for the Russell City Energy Center?**

The site is located in an area zoned for heavy industrial use and it is located next to the City of Hayward's wastewater treatment plant—where the Energy Center will obtain recycled water for the facility. The site is located near natural gas lines and close to a transmission substation that will carry this much needed energy throughout the region.

## **Why Not Put the Facility in a More Remote Area?**

New electric generating facilities—located near where the energy is needed—will help insulate the residents and businesses in our area from the disruption and expense of inadequate electrical supplies. In fact, many electric generating facilities are located in urban areas, allowing the energy to be efficiently distributed where it is most needed. In the Bay Area, large, older plants are located in San Francisco and the East Bay and smaller plants are located at Agnews State Hospital, San Francisco International Airport and on the campuses of Stanford University, UC Berkeley, and San Jose State University.

## **Why Can't More Transmission Lines Solve Our Energy Problems?**

The construction of additional transmission lines is not only expensive, but requires 5 years or more for permitting and 2 years of construction time. A new electric generating facility can be permitted, built and begin delivering energy to the local population in approximately 4 years. Further, miles and miles of new transmission lines would negatively impact our open spaces. In addition, local generating facilities strengthen the regional electrical grid, enhancing the reliability and quality of our power supplies in a way that new transmission lines cannot.

## **How Clean and Safe is the Energy Center?**

The Russell City Energy Center will use combined-cycle technology, the same tested, proven technology that is currently being utilized in hundreds of modern electric generating facilities across the country and around the world. Through the use of advanced environmental technologies, these facilities allow for a greater than 90 percent reduction of emissions and are 40 percent more fuel efficient than older, fossil-fueled generating facilities in the Bay Area.

Calpine and Bechtel incorporate advanced safety features into the design of all of their electric generating facilities, and their highly-skilled employees undergo extensive safety training. During the operation of the facility, all systems will be monitored 24 hours a day. Both the gas and electrical systems will be built to meet exacting industry and government environmental standards, and all potentially hazardous materials will be limited in size and securely contained above ground. Further, the California Energy Commission will complete an exhaustive review of the proposed facility's safety and operations and will monitor and inspect the facility's operations for the life of the project.

## **Will the Energy Center Affect Local Air and Water Quality?**

Calpine and Bechtel must submit detailed environmental reports to the California Energy Commission (CEC) before approval will be given for the Russell City Energy Center. These reports will include any effects that the facility will have on every aspect of the environment, including air and water quality, noise, traffic and aesthetics. The design and operation of the plant will mitigate adverse impacts to insignificant levels.

The Russell City Energy Center will use the Best Available Control Technology approved by the Bay Area Air Quality Management District. The Energy Center must also purchase and permanently retire emission reduction credits obtained from within Hayward and the Bay Area in excess of the emissions created by the facility's operation.

The Energy Center will use recycled wastewater from the City of Hayward's wastewater treatment plant in its operations. Most of the water will be reused at the facility until it is evaporated. This will prevent millions of gallons of wastewater a day from otherwise flowing into San Francisco Bay.

The facility will be built using extensive noise reduction technology. During the quietest hours of the night, the facility will operate with noise levels that will be barely detectable.

## **Aren't New Energy Centers in Northern California Supposed to Solve the Area's Energy Problems?**

Yes, they are, and the Russell City Energy Center is one of several facilities needed to help solve our region's energy supply problems. Along with Calpine and Bechtel projects in Contra Costa and Sutter counties and elsewhere, the Energy Center will satisfy a major portion of the ever-growing demand for power. As energy resources imported from outside the state (such as hydropower from Washington state and coal and nuclear power from Arizona) are increasingly needed to address growth inside those states, new facilities like the Russell City Energy Center will be crucial to California's ability to continue to supply clean, reliable and affordable energy to our families and businesses.

## **What Will Building the Facility Cost Taxpayers?**

Nothing. The Russell City Energy Center is sponsored by Calpine and Bechtel who will bear all financial risk for building the facility.

## **How Many Jobs Will the Energy Center Create?**

The Energy Center will create approximately 250 union construction jobs and 20-25 full-time, high-wage jobs.

## **How Will Hayward Benefit from the Russell City Energy Center?**

Hayward and Alameda County will benefit from the approximately \$10 million in purchases of construction materials, supplies and services from local companies and the sales tax revenue from these purchases that go to state and local governments. And, the facility will contribute more than \$3-4 million each year in property taxes.

Calpine and Bechtel will also work with the city and local agencies to implement a program of community benefits including major funding of a new main city library, grants to selected local foundations and improvements to hiking/biking trails.

## **Who Approves New Energy Centers?**

The California Energy Commission (CEC) is responsible for the licensing of new generating facilities in the state. To obtain approval, the Russell City Energy Center must go through a rigorous environmental review process that will be led by the CEC with the participation of federal, state and local governments, environmental agencies and the public. The purpose of the review is to ensure that the facility does not adversely impact public health or environment. The City of Hayward will advise the CEC and other agencies on the project's conformance with all local laws, ordinances, regulations and standards.

Copies of the full reports will be available at local public libraries and on the Internet. Before approval of a project is given, the community will be invited to participate in the environmental review process at public hearings and environmental workshops held in Hayward. Calpine and Bechtel welcome and encourage the participation of the community in this entire process.

## **How Can I Get More Information?**

Over the next few months, Calpine and Bechtel and the California Energy Commission will communicate with Hayward residents and provide information about open houses, community meetings and environmental workshops and hearings. Residents and businesses interested in learning more about the project can reach us by calling our Community Outreach line at 510-704-8475.

## **What is Russell City?**

The Energy Center will be located in a formerly unincorporated area of Hayward which was known as Russell City. Russell City was settled by Danish dairy farmers in the 1800's and by the 1940's had become a largely African American community. The post-war years saw the emergence of a music form known as West Coast Blues which

was performed in after-hours nightclubs in Russell City. This musical tradition lives on through the annual Hayward-Russell City Blues Festival.

CALIFORNIA ENERGY COMMISSION  
1516 NINTH STREET  
SACRAMENTO, CA 95814-5512



<b>DOCKET</b> 01-AFC-7
<b>DATE</b> JUN 20 2001
<b>RECD.</b> JUN 20 2001

June 20, 2001

TO: AGENCY DISTRIBUTION LIST

**REQUEST FOR AGENCY PARTICIPATION IN THE REVIEW OF THE RUSSELL CITY 600 MW (MEGAWATT) ENERGY CENTER, APPLICATION FOR CERTIFICATION (01-AFC-7) SUPPLEMENTAL INFORMATION**

We recently sent you an Application for Certification (AFC) on the above referenced project for your review and comments. On June 20, 2001, the project applicant filed the enclosed supplemental material to the AFC. This includes information on the following technical areas: electrical transmission, air quality, cultural resources, hazardous materials handling, noise, socioeconomics, visual resources, water resources, soil and water resources.

If you have questions about this material, or on how to participate in the Energy Commission's review of the project, please contact Sandra Fromm, Siting Project Manager, at (916) 654-4206. The status of the project, copies of notices and other relevant documents are also available via the Energy Commission's web site at: <http://www.energy.ca.gov/sitingcases/index.html>.

Sincerely,

PAUL RICHINS, JR.  
Energy Facilities Licensing Program Manager

Enclosure

FS	DES	AFS-FWR	AFS-EA	AFS-HC	AFS-ES	
OPS	IMPL	HC	ESU	LD	CP	ADMIN

Coordinate with (ES) as appropriate  
DOB 7/5/01  
Dan H. \_\_\_\_\_

FILE:

September 21, 2001  
SO-2449-092101-DD

Ms. Kae Lewis  
Project Manager  
California Energy Commission  
1516 9<sup>th</sup> Street  
Sacramento, CA 95814

**SUBJECT: BIOLOGICAL ASSESSMENT FOR THE RUSSELL CITY ENERGY CENTER  
PROJECT (01-AFC-07)**

Dear Ms. Lewis:

Attached for filing with the California Energy Commission Docket Unit are an original and 12 copies of a Biological Assessment for the Russell City Energy Center (01-AFC-07).

Sincerely,



Douglas M. Davy, Ph.D.  
AFC Project Manager

Attachment

cc: Alex Ameri, City of Hayward  
Service list

**Supplement**

to the

**Application for Certification**

for the

**Russell City Energy Center**

**Hayward, California**

**01-AFC-7**

**Submitted to the**

**California Energy Commission**

**Submitted by**

**Calpine/Bechtel Joint Development**

**June 2001**

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# 1. INTRODUCTION

This supplement to Calpine/Bechtel's Application for Certification (AFC) for the Russell City Energy Center (01-AFC-7), responds to comments that California Energy Commission (CEC) Staff have made with respect to data adequacy on data adequacy worksheets submitted to Calpine/Bechtel. The format for this supplement follows the order of the AFC, with comments on Electrical Transmission (Chapter 6.0), Air Quality (Chapter 8.1), Cultural Resources (Chapter 8.3), Hazardous Materials Handling (Chapter 8.5), Noise (Chapter 8.7), Socioeconomics (8.10), Visual Resources (Chapter 8.13), and Water Resources (Chapter 8.15). Discussion of the data adequacy worksheet for Soil and Water Resources (6-month) follows the Water Resources section, since comments in this worksheet have to do with water resources and repeat the questions posed in the 12-month Water Resources data adequacy worksheet. Only sections for which CEC Staff posed requests or questions related to data adequacy are addressed in this supplement. If the request asked for additional appended material, it is included at the end of each section.

## 6.0 ELECTRICAL TRANSMISSION

### **1. Power Flow Diagram (6-month expedited process [§2022(b)(3)(A)]):**

*An interconnection study identifying the electrical system impacts and a discussion of the mitigation measures considered and those proposed to maintain conformance with NERC, WSCC, Cal-ISO or other applicable reliability or planning criteria based on load flow, post transient, transient, and fault current studies performed by or for the transmission owner in accordance with all applicable Cal-ISO or other interconnection authority's tariffs, operating agreements, and scheduling protocols.*

#### **Information required to make AFC conform with regulations:**

*Provide power flow diagram for normal conditions, with and without the project, and for contingencies, which caused a criteria violation.*

*Provide a discussion of the mitigating measures considered and those proposed for criteria violations.*

**Response**—Power flow diagrams for normal conditions, with and without the project, are provided at the end of this section. We used the 996/1129 A ratings originally provided for the San Mateo-Eastshore line in the model rather than the ratings that may materialize from PG&E's ongoing assessment. These will be updated as information becomes available.

On Monday, June 11, 2001, Dan Wood of Utility System Efficiencies, Inc. confirmed with Al McCuen of the CEC via telephone that submission of these power flow diagrams provides sufficient information for the Transmission System Engineering component of the AFC to be declared data adequate. Per this telephone conversation, no discussion of mitigating measures will be required for data adequacy.

### **2. Power Flow Diagrams (12-month process [Appendix B(b)(2)(C)]):**

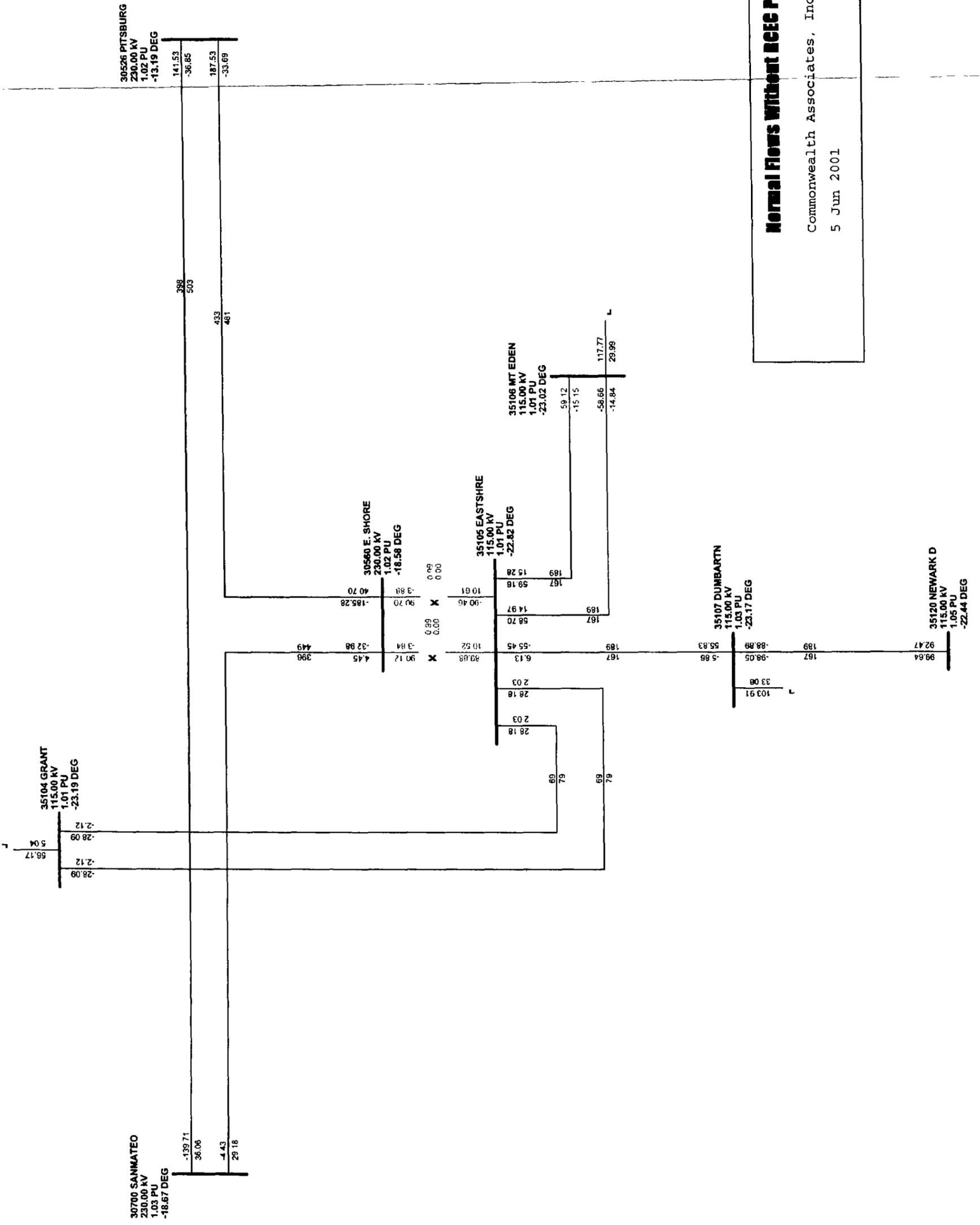
*A detailed description of the design, construction, and operation of any electric transmission facilities, such as power lines, substations, switchyards, or other transmission equipment, which will be constructed or modified to transmit electrical power from the proposed power plant to the load centers to be served by the facility. Such description shall include the width of rights of way and the physical and electrical characteristics of electrical transmission facilities such as towers, conductors, and insulators. This description shall include power load flow diagrams which demonstrate conformance or nonconformance with utility reliability and planning criteria at the time the facility is expected to be placed in operation and five years thereafter;*

#### **Information required to make AFC conform with regulations:**

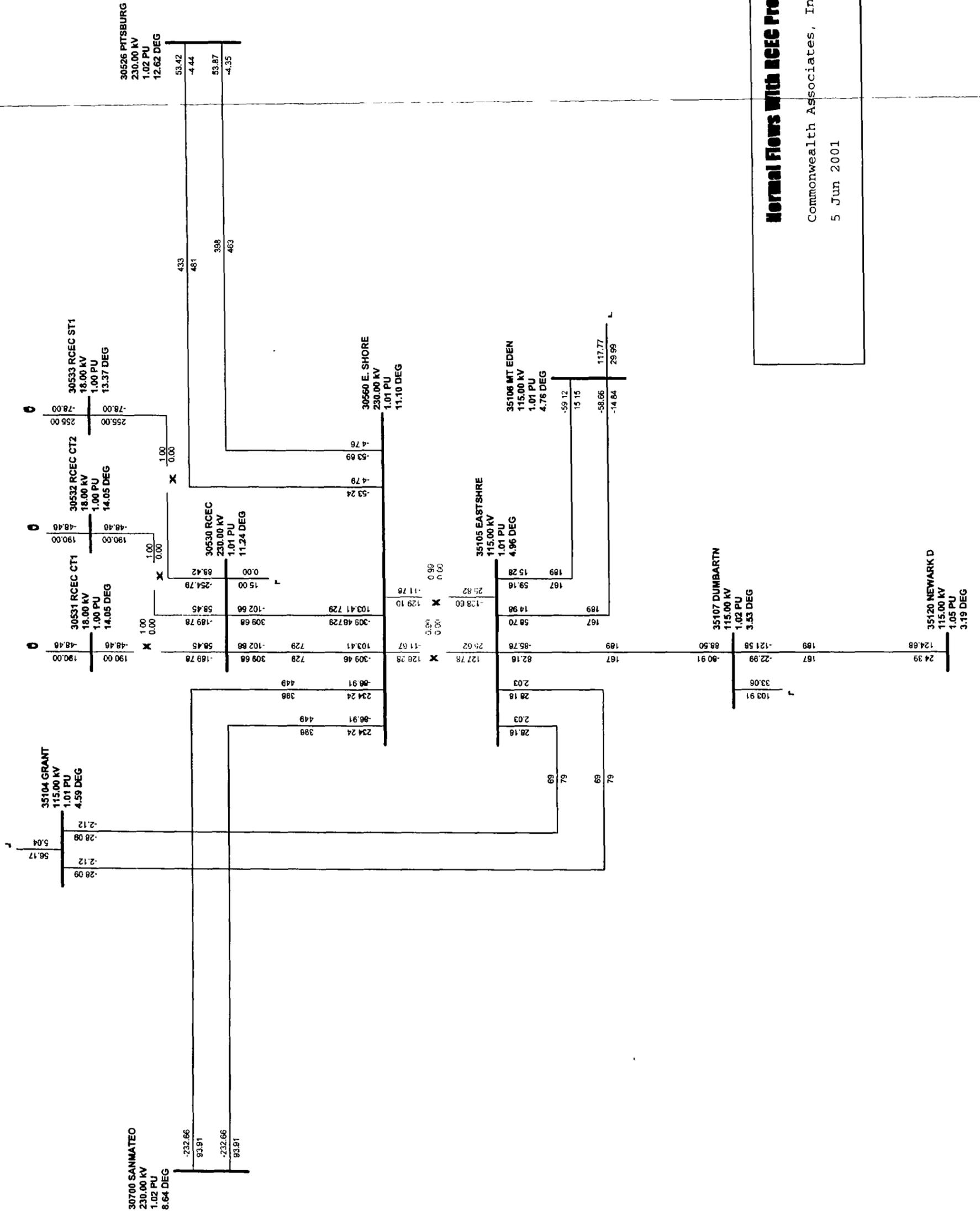
*Provide power flow diagrams for normal conditions, with and without the project, and for contingencies, which caused a criteria violation.*

**Response**—See 6-month data adequacy response above.

## POWER FLOW DIAGRAMS



**Normal Flows Without REC Project**  
 Commonwealth Associates, Inc.  
 5 Jun 2001



**Normal Flows With RCEC Project**  
 Commonwealth Associates, Inc.  
 5 Jun 2001

## 8.1 AIR QUALITY

### *1. Cumulative Impact Analysis (6-month expedited process [§2022(b)(2)(A)])*

*A detailed modeling analysis assessing whether the cumulative impacts of all inert criteria pollutants (NO<sub>x</sub>, SO<sub>2</sub>, CO, and PM<sub>10</sub>) from the project's typical operating mode in combination with all stationary emissions sources within a six-mile radius of the proposed site that have received construction permits, but are not yet operational, and all stationary emissions sources that are currently undergoing air district permit application review will cause or contribute to a violation of any ambient air quality standard.*

#### **Information required to make AFC conform with regulations:**

*Appendix 8.1H is a cumulative impact analysis protocol. Please provide the completed cumulative impact analysis.*

**Response**—A source emissions inventory was obtained from BAAQMD for the area surrounding the Russell City Energy Center (RCEC). BAAQMD identified a total of 17 facilities within 8 miles, or 12.9 kilometers, of the RCEC location at UTM coordinates 576,900 meters east and 4,165,400 meters north, that hold Authority to Construct permits but which have not yet commenced operation. Out of the 17 facilities identified, six were included in the multi-source modeling analysis. The remaining facilities are permitted only VOC emissions and were not included in the analysis. This six modeled facilities with PM, SO<sub>2</sub>, NO<sub>x</sub>, or CO emissions as shown below. The BAAQMD inventory printout is attached.

Plant ID	Facility Name	UTM Coord. (km)		Emissions (tons/year)			
		East	North	PM	NO <sub>x</sub>	SO <sub>x</sub>	CO
1209	Union Sanitary District	580,423	4,160,817	0.6	7.2	2.2	19.2
2815	Tuscarora Inc	577,279	4,165,336	0.0	0.8	0.0	1.2
3255	Bay Equip & Repair	577,633	4,165,381	1.8	0.0	0.0	0.0
7688	Emerald Packaging	585,470	4,161,765	0.2	3.1	0.0	12.3
12574	Cal Hi Tec Finishing	577,287	4,167,692	0.0	0.3	0.0	0.1
12687	Container Recycling	585,371	4,161,557	26.0	0.4	0.0	4.5

Each multi-source facility was conservatively modeled with ISCST3 as a low single stack (10 meters high) with negligible plume rise (ambient temperature, 0.01 m/s exit velocity, and a 0.1 meter stack diameter) at the facility location provided. Modeled emissions were based on 8760 hours/year of operation (i.e., 0.126 g/s per lb/hour x tons/year x 2000 lbs/ton / 8760 hours/year). NO<sub>x</sub> emissions were modeled with ISC3OLM to determine 1-hour NO<sub>2</sub> concentrations based on the Ozone Limiting Method and annual ISCST3 NO<sub>2</sub> concentrations were assumed to be 75% of the annual NO<sub>x</sub> concentrations modeled with ISCST3 based on the Ambient Ratio Method.

The facilities were modeled with the coarse, downwash, and facility fence-line receptor grids modeled earlier for the facility. In addition, fine 30-meter receptor grids were placed around all of the multisource facilities, which extended at least 200 meters in all directions. The methodology calls for maximum concentrations modeling to be refined with 30-meter receptor grids if the maximum concentrations are

located in the coarse receptor grid. For this analysis, this step was unnecessary since all maximum modeled concentrations occurred in the 30-meter multisource fine grid, the 30-meter facility downwash grid, or along the RCEC fenceline. Maximum modeled locations were verified to occur well within the edges of the 30 meter spaced receptor grids when appropriate. Results of the multisource analysis were added to maximum background concentrations and compared to state and federal ambient air quality standards.

Maximum modeled 1-hour CO and NO<sub>2</sub> concentrations are due to RCEC emissions and occur on the RCEC fenceline and 30-meter downwash grids, respectively. Maximum modeled concentrations for other pollutants and averaging times are caused by other facilities and occur in the 30-meter fine grids placed around each multisource facility. Maximum modeled 8-hour CO, annual NO<sub>2</sub>, and SO<sub>2</sub> concentrations are due to Union Sanitary District emissions and occur near this facility. Maximum modeled PM<sub>10</sub> concentrations are due to Container Recycling Alliance emissions and occur near this facility. As described earlier, 1-hour and annual NO<sub>2</sub> modeled concentrations are based on the Ozone Limiting Method (using ISC3OLM) and Ambient Ratio Method (using 75%), respectively.

These maximum modeled concentrations are added to maximum background concentrations and then compared to the state and federal ambient air quality standards. The maximum ambient (modeled plus background) concentrations are less than the applicable standards for all pollutants except PM<sub>10</sub>. For PM<sub>10</sub>, 24-hour and annual modeled concentrations exceeded the state and federal ambient air quality standards. The modeling indicates that Container Recycling Alliance emissions are responsible for over 99% of the maximum modeled PM<sub>10</sub> concentrations. RCEC's contributions to the modeled PM<sub>10</sub> exceedances are less than the significant impact levels for all modeled receptors. Therefore, RCEC is not considered to cause or contribute to the modeled PM<sub>10</sub> exceedances.

Pollutant	Averaging Time	Maximum Multi-source Concentration (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	Total Ambient Concentration (µg/m <sup>3</sup> )	RCEC Contribution (µg/m <sup>3</sup> )	State Standard (µg/m <sup>3</sup> )	Federal Standard (µg/m <sup>3</sup> )
NO <sub>2</sub>	1-hour	169.0	206.8	376	169.0	470	-
	Annual	10.4	41.5	52	0.018	-	100
SO <sub>2</sub>	1-hour	116.6	104.8	221	0	650	-
	3-hour	74.49	52	126	0	-	1300
	24-hour	18.8	18.4	37	0	109	365
	Annual	4.22	5.3	9.5	0.002	-	80
CO	1-hour	1230.6	6440	7671	1230.6	23,000	40,000
	8-hour	415.9	3617	4033	0	10,000	10,000
PM <sub>10</sub>	24-hour	292.2	88	380	0.071	50	150
	Ann.Geo.	60.1	21.9	82.0	0.060	30	-
	Ann.Arith.	60.1	24.3	84.4	0.060	-	50

**2. Initial Commissioning Phase (6-month expedited process [§2022(b)(2)(B)]):**

*A description of the project's planned initial commissioning phase, which is the phase between the first firing of emissions sources and the consistent production of electricity for sale to the market, including the types and durations of equipment tests, criteria pollutant emissions, and monitoring techniques to be used during such tests, and air dispersion modeling analyses of the impacts of those emissions on state and federal ambient air quality standards for NO<sub>2</sub>, SO<sub>2</sub>, CO, and PM<sub>10</sub>.*

**Information required to make AFC conform with regulations:**

*Please provide a description of the projects planned initial commissioning phase including the type and duration of equipment tests, proposed monitoring to be used during such tests, estimates of all criteria pollutant emissions, and air dispersion modeling analyses of the impacts of those emissions on state and federal ambient air quality standards for NO<sub>2</sub>, SO<sub>2</sub>, CO, and PM<sub>10</sub>.*

**Response**—Turbine commissioning emissions data and air quality modeling results are presented in the application. No violations of ambient air quality standards were predicted. The types and lengths of the source tests that Calpine/Bechtel will perform during the commissioning process for the selected Siemens-Westinghouse combustion turbines are not available at this time. However, the total time duration between first fire of the first CT and Source Testing will not exceed 300 hours. The CEC provided data with regards to commissioning, but this was for a GE-type turbine, and may not be precisely applicable to the Westinghouse engine.

The BAAQMD has established permit conditions for turbine commissioning for both the Calpine/Bechtel Delta Energy Center (DEC) and Metcalf Energy Center (MEC) projects. The same conditions are proposed for the Russell City Energy Center project. The following data was specifically developed for the Siemens-Westinghouse turbines to be used in all three projects.

**Proposed Conditions for the Commissioning Period:**

1. The owner/operator of the Russell City Energy Center (RCEC) shall minimize emissions of carbon monoxide and nitrogen oxides from the Gas Turbines and Heat Recovery Steam Generators (HRSGs), to the maximum extent possible during the commissioning period. The commissioning period is comprised of several equipment tests. The commissioning period shall not extend beyond 300 hours.
2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the combustors of the Gas Turbines and the Heat Recovery Steam Generators, shall be turned to minimize the emissions of carbon monoxide and nitrogen oxides.
3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the SCR Systems shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from the Gas Turbines and the Heat Recovery Steam Generators.
4. The owner/operator of RCEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of the Gas Turbines describing the procedures to be

followed during the commissioning of the turbines, HRSGs, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO<sub>x</sub> combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NO<sub>x</sub> continuous emission monitors, and any activities requiring the firing of the Gas Turbines and HRSGs, without abatement by their respective SCR Systems.

5. During the commissioning, the owner/operator of RCEC shall demonstrate compliance with conditions 7 through 9 and 11 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:
  - firing hours
  - fuel flow rates
  - stack gas nitrogen oxide emission concentrations
  - stack gas carbon monoxide emission concentrations
  - stack gas oxygen concentrations

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines and HRSGs. The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO<sub>x</sub> and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

6. The District-approved continuous monitors specified in condition 5 shall be installed, calibrated, and operated prior to first firing of the Gas Turbines and Heat Recovery Steam Generators. After first firing of the turbines, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NO<sub>x</sub> emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.
7. The total number of firing hours of a Gas Turbine and Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by the SCR System shall not exceed 300 hours during the commissioning period. Such operation of a Gas Turbine and HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.
8. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM<sub>10</sub> and sulfur dioxide that are emitted by the Gas Turbines and Heat Recovery Steam Generators during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in the permit application.

9. Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District- and CEC-approved source test using external continuous emission monitors to determine compliance the emission limits specified during commissioning. The source test shall determine NO<sub>x</sub>, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty calendar days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this condition. The district and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC CPM within the seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within 30 days of the source testing date.

**3. BAAQMD Determination of Compliance (12-month process [Appendix B(g)(8)(A)]):**

*The information necessary for the air pollution control district where the project is located to complete a Determination of Compliance.*

***Information required to make AFC conform with regulations:***

*On June 1<sup>st</sup> Mike Ringer (CEC) spoke to Ken Lim (BAAQMD) who indicated that BAAQMD had yet to receive a permit application. Please provide a letter from the BAAQMD indicating that they have all information necessary to complete a DOC.*

**Response**—BAAQMD received Calpine/Bechtel's Authority to Construction (ATC) application for the Russell City Energy Center on May 30<sup>th</sup>. The BAAQMD ruled the application data adequate on June 11<sup>th</sup>, 2001. A copy of the BAAQMD letter documenting receipt of the ATC application and its data adequacy is attached.



**BAAQMD NEW FACILITY INVENTORY**





BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

ALAMEDA COUNTY  
Roberta Cooper  
Scott Haggerty  
(Vice-Chairperson)  
Nate Miley  
Shelia Young

CONTRA COSTA COUNTY  
Mark DeSaulnier  
Mark Ross  
Gayle Uilkema

MARIN COUNTY  
Harold C. Brown, Jr

NAPA COUNTY  
Brad Wagenknecht

SAN FRANCISCO COUNTY  
Chris Daly  
Leland Yee

SAN MATEO COUNTY  
Jerry Hill  
Marland Townsend  
(Secretary)

SANTA CLARA COUNTY  
Randy Attaway  
(Chairperson)  
Liz Kniss  
Julia Miller  
Dena Mossar

SOLANO COUNTY  
William Carroll

SONOMA COUNTY  
Tim Smith  
Pamela Torliatt

Ellen Garvey  
Executive Officer/  
Air Pollution Control Officer

April 26, 2001

RTP Enviromental Associates Inc.  
7752 Fay Avenue, Suite C  
La Jolla, California 92037

Attention: Mr. Gregory Darwin

Subject: Calpine Russel City Project Request for Source Emission Inventory

Dear Mr. Darwin:

Enclosed are two printouts of criteria emission from stationary sources located within an eight mile radius of the site specified (UTM km 576.900E, 4165.400N). The first list contains the criteria emissions of seventeen facilities that have an Authority to Construct, but have not commenced operation. These emissions are potential to emit and may not reflect the future actual operating emissions. Individual stack parameters are not available for these facilities.

The second printout contains the criteria emission for 374 existing facilities. This list shows the emissions by individual sources and where available, the typical stack parameters and UTM coordinates. The individual source data units are as follows: Emissions in pounds per day, Stack height in feet, Stack cross section area in square feet, Gas temperature in degree Fahrenheit, Gas flow in actual cubic feet per minute, and UTM in kilometers. The -8888 character should be interpreted as "no data available".

If you have any questions on this matter please call me at (415) 749-4683.

Very truly yours,

Gene Willner  
Air Quality Engineer II

:csw  
Enclosures (2)

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.0	.7	.0	.0	.0

\*\*\*\*\*

Plant No.: 7688 [ 5.78 miles from the point spec] 585.470E 4161.765N

Emerald Packaging Inc  
33050 Western Avenue  
Union City, CA 94587

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.2	.0	3.1	.0	12.3

\*\*\*\*\*

Plant No.: 11677 [ 6.26 miles from the point spec] 571.878E 4174.140N

Treasure Chest Advertising Co, Inc  
1345E Doolittle Drive  
San Leandro, CA 94577

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.0	.0	.0	.0	.0

\*\*\*\*\*

Plant No.: 11816 [ .26 miles from the point spec] 576.950E 4165.810N

Xtra Lease Inc  
3600 Depot Road  
Hayward, CA 94545

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.0	4.1	.0	.0	.0

\*\*\*\*\*

Plant No.: 11984 [ 1.54 miles from the point spec] 578.224E 4167.503N

Jack's Cleaners & Shirt Laundry  
1214 W Winton Street  
Hayward, CA 94544

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.0	.7	.0	.0	.0

\*\*\*\*\*

Plant No.: 12068 [ 4.61 miles from the point spec] 580.386E 4171.952N

Francis Refinishing  
2620 Norbridge Avenue  
Castro Valley, CA 94546

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS TONS/YEAR	.0	.8	.0	.0	.0

\*\*\*\*\*

Plant No.: 12115 [ 4.30 miles from the point spec] 583.649E 4163.863N

Spectrum Label Corporation  
30803 San Clemente  
Hayward, CA 94544

	PART	0	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	.7	.0	.0	.0

\*\*\*\*\*

Plant No.: 7688 [ 5.78 miles from the point spec] 585.470E 4161.765N

Emerald Packaging Inc  
33050 Western Avenue  
Union City, CA 94587

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.2	.0	3.1	.0	12.3

\*\*\*\*\*

Plant No.: 11677 [ 6.26 miles from the point spec] 571.878E 4174.140N

Treasure Chest Advertising Co, Inc  
1345E Doolittle Drive  
San Leandro, CA 94577

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	.0	.0	.0	.0

\*\*\*\*\*

Plant No.: 11816 [ .26 miles from the point spec] 576.950E 4165.810N

Xtra Lease Inc  
3600 Depot Road  
Hayward, CA 94545

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	4.1	.0	.0	.0

\*\*\*\*\*

Plant No.: 11984 [ 1.54 miles from the point spec] 578.224E 4167.503N

Jack's Cleaners & Shirt Laundry  
1214 W Winton Street  
Hayward, CA 94544

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	.7	.0	.0	.0

\*\*\*\*\*

Plant No.: 12068 [ 4.61 miles from the point spec] 580.386E 4171.952N

Francis Refinishing  
2620 Norbridge Avenue  
Castro Valley, CA 94546

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	.8	.0	.0	.0

\*\*\*\*\*

Plant No.: 12115 [ 4.30 miles from the point spec] 583.649E 4163.863N

Spectrum Label Corporation  
30803 San Clemente  
Hayward, CA 94544

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	16.5	.0	.0	.0

\*\*\*\*\*

Plant No.: 12520 [ .70 miles from the point spec] 577.405E 4164.398N

Zyomyx Inc  
3911 Trust Way  
Hayward, CA 94545

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	1.3	.0	.0	.0

\*\*\*\*\*

Plant No.: 12574 [ 1.44 miles from the point spec] 577.287E 4167.692N

Cal Hi Tec Finishing LLC  
1680 W Winton Ave, Unit #1  
Hayward, CA 94545

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	1.9	.3	.0	.1

\*\*\*\*\*

Plant No.: 12687 [ 5.78 miles from the point spec] 585.371E 4161.557N

Container Recycling Alliance  
33333 Western  
Union City, CA 94587

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	26.0	.2	.4	.0	4.5

\*\*\*\*\*

Plant No.: 12838 [ 2.25 miles from the point spec] 577.783E 4168.916N

A & H Gas c/o Portico, Inc  
20450 Hesperian Blvd  
Hayward, CA 94540

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	.1	.0	.0	.0

\*\*\*\*\*

Plant No.: 12980 [ .48 miles from the point spec] 576.971E 4166.175N

Vuteq Corporation  
3624 Munster Avenue  
Hayward, CA 94545

	PART	ORG	NOX	SOX	CO
EMISSION TOTALS					
TONS/YEAR	.0	2.7	.0	.0	.0

\*\*\*\*\*

Total Number of Facilities Found 17

**BAAQMD LETTER DOCUMENTING  
RECEIPT OF INFORMATION FOR PERMIT APPLICATION REVIEW**



**BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT**

June 11, 2001

**Mr. Steve Larson  
Executive Director  
California Energy Commission  
1516 Ninth Street  
Sacramento CA 95814**

**ALAMOSA COUNTY  
Roberta Cooper  
Scott Hoggarty  
(Assoc-Chairperson)  
Hale Wiley  
Shawn Young**

**CONTRA COSTA  
COUNTY  
Mark DeSantis  
Mark Raso  
Gayle Williams**

**MARIN COUNTY  
Harold C. Brown, Jr.**

**SAN PIAZZA COUNTY  
Brent Wagonradt**

**SAN FRANCISCO  
COUNTY  
Chris Daly  
Leland Yoo**

**SAN MATEO COUNTY  
Amy Hill  
Marlene Townsend  
(Secretary)**

**SANTA CLARA COUNTY  
Randy Atkinson  
(Chairperson)  
Liz Kniss  
John Miller  
Dana Messer**

**SOLANO COUNTY  
William Carroll**

**SONOMA COUNTY  
Tim Smith  
Patricia Tarble**

**Other County  
EXECUTIVE OFFICERS  
AIR POLLUTION  
CONTROL OFFICER**

Dear Mr. Larson:

This is to inform you that we have completed our initial review of the Application for Certification (AFC) that was submitted by Calpine/Bechtel Joint Development for the Russell City Energy Center. In accordance with the requirements of Bay Area Air Quality Management District Regulation 2-3-402, we have determined that the AFC contains sufficient information for the District to undertake a Determination of Compliance review.

If you have any questions, please contact me at Tel: (415) 749-4708, Fax: (415) 749-5030, or E-mail: [wlee@baaqmd.gov](mailto:wlee@baaqmd.gov).

Very truly yours,

*William Lee*  
William Lee, PE  
Air Quality Engineer  
Permit Services Division

cc: James R. Leaby, Development Manager, Calpine/Bechtel Joint Development  
RTP Environmental Associates, Inc.

939 ELLIS STREET - SAN FRANCISCO CALIFORNIA 94109 - 415.771.6000 - [www.baaqmd.gov](http://www.baaqmd.gov)

## 8.3 CULTURAL RESOURCES

### ***1. Changes in LORS (6-month expedited process [§2022(b)(1)(C)]):***

*Where a standard, ordinance, or law is expected to change between the time of filing an application and certification, information from the responsible jurisdiction documenting the impending change, the schedule for enactment of the change, and whether the proposed project will comply with the changed standard, ordinance, or law.*

#### ***Information required to make AFC conform with regulations:***

*Please identify any ordinance or law that is expected to change and whether the project will comply with the changes. If no standards, ordinances or laws apply, please make that statement.*

**Response**—Foster Wheeler Environmental staff contacted the Advisory Council on Historic Preservation (ACHP) to determine if there would be any changes in applicable federal laws, ordinances, regulations, and standards pertaining to historic properties that may have an effect on the Russell City Energy Project. Ron Anzelone, of the Washington, D.C. ACHP office, was contacted on June 15, 2001. He said he did not foresee any upcoming changes in the laws. He did mention President's Executive Order 13212 would establish an interagency task force chaired by Council on Environmental Quality. This task force will look at any necessary streamlining of all environmental review requirements that would be required for power projects. Foster Wheeler staff also contacted Mr. Clarence Caesar of the California Office of Historic Preservation on June 18, 2001 to determine whether or not there might be laws, ordinances, regulations, or standards at the state level that would change in the near future. Mr. Caesar, similarly, did not foresee any such changes.

### ***2. Personnel Qualifications (12-month process [Appendix B(g)(2)(B)]):***

*A description of all literature searches and field surveys used to provide information about known cultural resources in the project vicinity. If survey records of the area potentially physically affected by the project are not available, and the area has the potential for containing significant cultural resources, the applicant shall submit a new or revised survey for any portion of the area lacking comprehensive survey data. A discussion of the dates of the surveys, methods used in completing the surveys, and the identification and qualification of the individuals conducting the surveys shall be included.*

#### ***Information required to make AFC conform with regulations:***

*Please identify and provide the qualifications (resumes) for the members of the project team who conducted the drive-by architectural reconnaissance.*

**Response**—Andrew Gorman and Douglas Davy, Ph.D., of Foster Wheeler Environmental Corporation conducted architectural reconnaissance for the RCEC project. Andrew Gorman's resume has been provided in Appendix 8.3-A of the AFC. Douglas Davy's resume is included at the end of this section.

### ***3. Historically Significant Structures (12-month process [Appendix B(g)(2)(C)]):***

*A discussion of the sensitivity of the project area described in subsection (g)(2)(A) and the presence and significance of any known archeological sites and other cultural resources that may be affected by the project. Information on the specific location of archeological resources shall be included in a separate*

*appendix to the application and submitted to the Commission under a request for confidentiality pursuant to Title 20, California Code of Regulations, § 2501 et seq.*

***Information required to make AFC conform with regulations:***

*Please identify the location of any buildings, features or objects that may be older than 45 years that are adjacent to the project or the linears (one property deep).*

**Response—**The project team conducted a drive-by-architectural reconnaissance to determine whether any potentially significant historic architecture is located within the project APE. In addition, USGS 1994 digital orthophoto aerial photographs and historical aerial photographs dated 1946, 1958, and 1969 were compared and examined against historic USGS topographic maps for buildings or structures adjacent to the Russell City Energy Center and linear alignments that might have survived redevelopment in the Hayward Industrial Corridor, which took place largely during in the 1960s, 1970s, and 1980s. The USGS topographic maps examined were the San Leandro 1947 and 1959 (revised 1968) quadrangle maps for the RCEC project site and the 1942 and 1946 Hayward quadrangles for the natural gas pipeline and electrical transmission line.

The drive-by and map examination showed that showed that the City of Hayward Water Pollution Control Facility (WPCF) was constructed in 1954, making it 47 years old. Most of the plant's treatment works, however, were constructed during the 1980s (Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward, personal communication, June 14, 2001). There are no other buildings or structures older than 45 years old in lots adjacent to the project or project facilities.

The 1942 and 1946 USGS Hayward 7.5-minute maps and the 1946 aerial photograph show a dirt road in the same location as today's Enterprise Avenue extending west from what is now the intersection of Enterprise Avenue and Clawiter Road. In 1946, there were farmsteads on the northwest and southwest corners of this intersection. In the 1950 edition of the Hayward quadrangle, only the two structures on the south side of the dirt road still remain. The 1959 USGS Hayward map shows only one structure remaining. Enterprise Avenue is shown as an improved street, rather than dirt road. By the time of the 1969 aerial photograph, industrial infilling has begun. The 1994 aerial photographs show that recent industrial developments have replaced any earlier structures.

The 1946 USGS Hayward topographic quadrangle and the 1946, 1958, and 1969 aerial photographs were reviewed to examine the area along the project electrical transmission line between the RCEC and the Eastshore Substation. The photographs show a farmstead located off of Eden Landing Road south of State Route 92 in 1946 and 1958. By 1969 (aerial photograph) the widening of State Route 92 and construction of the Clawiter Road/Eden Landing Road overpass had encroached on the farmstead, though some structures remained. The 1994 aerial photograph shows that these structures have been replaced by industrial buildings along Investment Drive.

# **CULTURAL RESOURCES RESUME**

**D.M. Davy, Ph.D.**

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**Douglas M. Davy, Ph.D.****Supervising Cultural Resources Scientist****EXPERIENCE SUMMARY**

Twenty years of experience in cultural resources management, including prehistoric and historic archaeology, traditional cultural properties, and historic architecture and engineering. Fifteen years experience as a manager of archaeological field projects in support of regulatory compliance programs for energy, transportation, mineral and water resources development, and hazardous materials management projects.

**EDUCATION**

Ph.D., Archaeology, Southern Illinois University, Carbondale, 1982

M.A., Ethnology, Southern Illinois University, Carbondale, 1978

B.A., Anthropology, University of California, Santa Cruz, 1970

**TRAINING**

General Services Administration, Federal Projects and Historic Preservation Law  
Project Management Training, Series 100 and 200, Foster Wheeler Environmental Corporation  
Hazardous Waste Operations and Emergency Response, OSHA 29-CFR 1910.120

**CERTIFICATION**

Register of Professional Archaeologists, 1999 (SOPA since 1985)

**REPRESENTATIVE PROJECT EXPERIENCE**

*Statewide Historic Buildings and Structures Inventory, DoD Installations, State of California; U.S. Army Corps of Engineers, Sacramento District.* Project Manager for inventory and overview of buildings and structures surveys for 93 military bases in California. Project involved literature search and historic context development for California as a region and for the Cold War and Korean War periods and a compilation of all historic buildings and structures at California military bases.. The resulting report will be used as a guide for all future historic buildings and structures inventories in California. Project review committee included representatives of the four military service branches, State Historic Preservation Office, Advisory Council on Historic Preservation, and National Park Service. This project was awarded the Governor's Preservation Award in 2001.

*Benicia Army Cemetery Historic Resources Management Plan; U.S. Army Corps of Engineers* - Project Manager for Historic Resources Management Plan and public interpretation plan for Benicia Army Cemetery, the oldest U.S. military post cemetery in the Pacific States. Directed archival research program at National Archives. Prepared a public interpretive program for the cemetery.

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**Douglas M. Davy, Ph.D.**

***Deseret Chemical Depot Integrated Cultural Resources Management Plan; US Army Corps of Engineers*** – Project Manager to prepare Integrated Cultural Resources Management Plan for Deseret Chemical Depot, Utah. Reviewed historic and archaeological resources including historic buildings and structures and prehistoric and historic archaeological sites. Prepared a cultural resources management planning guide for the installation.

***Historic Buildings and Structures Inventories, California Marine Corps Installations; US Army Corps of Engineers*** – Project Manager for historic buildings and structures inventory of all remaining uninventoried historic buildings and structures at US Marine Corps installations in California. Installations included Camp Pendleton and Marine Corps Air Ground Combat Center, Twentynine Palms.

***Historic and Archaeological Resources Protection Plan, Naval Weapons Station, Seal Beach and Fallbrook Detachment; US Army Corps of Engineers*** – Project Manager for a revised Historic and Archaeological Resources Protection (HARP) Plan for Naval Weapons Station, Seal Beach and Fallbrook Detachment. Plan includes consideration of all historic buildings and structures and historic and prehistoric archaeological sites on the installations.

***Eastern Transportation Corridor; Transportation Corridor Agencies*** - Project Archaeologist for 24-mile-long multi-lane toll road in Orange County, California. Directed construction monitors, consulted with 5 Native American Tribes, prepared Archaeological Resources Management Plan, and managed test excavation and laboratory analysis program to determine National Register eligibility of 22 archaeological sites discovered during construction. Directed scientific data recovery excavations to mitigate potential impacts to prehistoric rockshelter site and three deeply buried archaeological deposits discovered during construction.

***Northend Landfill Capping and Shoreline Protection Project; Naval Ordnance Center Pacific Division, U.S. Navy Engineering Field Activity Northwest*** - Project Archaeologist for landfill capping and shoreline protection project. Conducted test investigations to determine National Register eligibility of prehistoric shell midden site, consulted with 5 Native American tribes, prepared Archaeological Resources Treatment Plan and Memorandum of Agreement for data recovery to mitigate adverse effects on a prehistoric archaeological site. Directed scientific data recovery excavation as a mitigation measure at buried site in tidal zone.

***Devil's Nose/Cross County WaterPower Project FERC License Application; Amador County Water Resources Agency*** - Project Manager for cultural resources field inventory, National Register criteria evaluation, and Native American consultation, for a 121-MW water supply reservoir and hydroelectric project involving a 1,000-acre reservoir in central California. Recorded archaeological sites and conducted scientific field program to determine their eligibility for listing on the National Register of Historic Places. Coordinated cultural resources management activities with U.S. Forest Service, Office of Historic Preservation, Native American tribes, and other agencies.

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**Douglas M. Davy, Ph.D.**

***Vancouver to Sacramento Fiber Optic Conduit Installation Project; Worldwide Fiber Networks, Incorporated.*** Project archaeologist for fiber optic conduit installation project from Vancouver, British Columbia, to Sacramento, California. Managed literature search, field inventory, and site evaluation program for project permitting. Managed team of archaeological and Native American monitors for construction.

***Historic Properties Survey of Selected Areas at Fort Peck Lake; U.S. Army Corps of Engineers, Missouri River Division*** - Project Manager for archaeological survey of 4,000 acres at Fort Peck Lake, eastern Montana as a technical study in support of the EIS for the Missouri River Master Water Control Manual. Recorded 49 archaeological sites and analyzed reservoir shoreline erosion effects on historic properties.

***Stanford Oaks Golf and Residential Development; Landmark Land Company.*** Project Archaeologist and Project Manager for 1,100-acre golf course and residential community development. Recorded archaeological sites, and conducted archaeological excavations to evaluate the significance of 12 prehistoric and historic archaeological sites.

***Thomes-Newville Reservoir Archaeological Survey; California Department of Water Resources*** - Archaeological Field Director for 20,000-acre archaeological survey for water supply reservoir in northwestern California. Directed field operations and recorded more than 200 archaeological and historic sites.

***Regulatory Support Program; Federal Energy Regulatory Commission*** - Prepared Environmental Impact Statements and Environmental Assessments and conducted agency consultation to ensure compliance with Section 106 of the National Historic Preservation Act for hydroelectric projects in western United States in support of FERC staff. Prepared four major EISs and four EAs for hydroelectric projects in California, Oregon, Washington, Idaho, Nebraska, and Wisconsin. Prepared cultural resources portions of FERC's Licensing Handbook and Relicensing Handbook.

***SOFAR Upper Mountain Project; SOFAR Management Authority*** - Project Archaeologist for 110-MW hydroelectric project involving two large and two small reservoirs in central California. Conducted archaeological survey, prepared cultural resources management and monitoring plans, directed Native American consultation study to identify traditional cultural properties. Consulted with U.S. Forest Service, State Historic Preservation Office, and Native American tribes.

***Sly Park Flashboards EA; El Dorado Irrigation District*** - Project Archaeologist for National Register criteria evaluations of two prehistoric sites located on the shorelines of a reservoir in east-central California for reservoir expansion project. Planned and directed archaeological excavations to evaluate the sites, and prepared site evaluation report. Consulted with the Bureau of Reclamation, State Historic Preservation Office, and Native American tribes.

## Douglas M. Davy, Ph.D.

***Piñon Pine Power Project; Sierra Pacific Power Company*** - Project Archaeologist for historic properties survey and site evaluation program for a coal gasification project in west-central Nevada. Conducted field survey to identify sites, and directed test excavations to evaluate the National Register eligibility of a prehistoric archaeological site. Consulted with Native American tribe and State Historic Preservation Officer.

***Power Plant Site Certification Program; California Energy Commission*** - Assessed impacts of 10 proposed power plants in southern, central and northern California on archaeological, historical, Native American heritage, and paleontological resources. Proposed licensing conditions for power plant site certification. Presented expert testimony at site certification hearings. Prepared handbook for applicants for preparing applications for licensing. Projects located in Kern, San Mateo, Contra Costa, Monterey, and Los Angeles (3), counties.

***Columbia River System Operation Review EIS; Bonneville Power Administration*** - Prepared an EIS evaluating 21 alternatives for the reoperation of the 14 federal dams on the Columbia and Snake river systems. Analyzed potential effects of project operational alternatives on archaeological sites and Native American traditional cultural properties. Wrote computer program to analyze reservoir fluctuation effects on archaeological sites and authored data analysis chapters of technical appendix to EIS.

### PUBLICATIONS AND PRESENTATIONS

Davy, D.M. 1999. Early Holocene buried sites in the Tustin Plain. Society for California Archaeology, Sacramento, California.

Davy, D.M., R. Herbert, and J. Carrier. 1998. A Regional and Interservice Approach to Historic Buildings and Structures Evaluation. *Proceedings of the National Defense Industrial Association*.

Davy, D.M. in press. Lt. Colonel James Louis Mason, Corps of Engineers, 1817-1853. *Periodical: The Journal of America's Military Past*.

Davy, D.M. 1995. Simulating reservoir effects on archaeological sites for the Columbia River System Operation Review. Annual Meeting of the Northwest Anthropological Conference.

Davy, D.M. and B.A. Ramos. 1994. A statistical analysis of Gunther Barbed projectile points from two Northern California sites. *Proceedings of the Society for California Archaeology* 7.

Davy, D.M. 1994. River flow regulation as a measure to mitigate the effects of a hydroelectric project on a cultural landscape. Annual meeting of the National Council on Public History.

Davy, D.M. 1980. Borrowed concepts: a comment on Rhoades. *American Antiquity* 45:346-349.

## 8.5 HAZARDOUS MATERIALS HANDLING

### *1. Hydrogen Storage (6-month expedited process [§2022(b)(2)(I)]):*

*A demonstration that the proposed facility will not require storage of gaseous flammable or explosive materials in quantities greater than 25,000 standard cubic feet;*

### *Information required to make AFC conform with regulations:*

*While the application is data adequate it also indicates that the project does not comply with the requirements of the 6-month process. As proposed the project will involve storage of 95,000 scf of hydrogen.*

**Response**—Calpine-Bechtel will comply with this requirement by purchasing and storing make-up hydrogen in cylinders rather than a tube trailer. The total hydrogen quantity stored at the site will remain below 25,000 standard cubic feet. The estimated maximum storage quantity is 10,000 scf. This quantity will be sufficient to supply make-up hydrogen for three weeks, based on a leakage rate equal to the manufacturer's guaranteed maximum leakage rate of 475 scf per day.

## 8.7 NOISE

### *1. Switchyard and Transmission Line Noise (12-month process [Appendix B(g)(4)(F)]):*

*The audible noise from existing switchyards and overhead transmission lines that would be affected by the project and estimates of the future audible noise levels that would result from existing and proposed switchyards and transmission lines. Noise levels shall be calculated at the property boundary for switchyards and at the edge of the rights-of-way for transmission lines.*

#### **Information required to make AFC conform with regulations:**

*Description of noise levels at right-of-way of new 1.1-mile length 230 kV transmission line. Description of whether project will result in changes in existing noise levels at PG&E Eastshore Substation.*

**Response**—The 1.1-mile transmission line spanning from the RCEC to the Eastshore Substation is represented in Section 6.0 of the AFC as Cross Sections A1 and A2 for existing and post-RCEC construction transmission line configurations. An audible noise study was performed to assess existing (A1) and future (A2) noise levels generated by the transmission lines under worst-case conditions. Noise-level calculations were performed assuming line voltages of 121 kV (115kV plus five percent) for the existing conditions and 121 kV and 242 kV (230 kV plus five percent) for the future conditions after RCEC goes on-line. The highest levels of corona and, hence, audible noise will occur during rain events when the conductors are wet. Therefore, both scenarios assumed rainy conditions during the analysis. Noise levels were modeled using ENVIRO, a program developed by the Electric Power Research Institute. Noise levels were calculated at a five-foot microphone height above flat terrain. Results from the study are depicted graphically in Figure 6.4-10 (existing conditions) and Figure 6.4-11 (conditions with RCEC on-line) in the AFC; the tabulated results are included in Appendix 6-L.

The transmission line right-of-way is 145 feet wide throughout the 1.1-mile corridor. The present alignment of the existing 115 kV transmission line is off-centered within the right-of-way, with the northeast edge of the right-of-way 40 feet from the centerline of the existing line. The proposed transmission line alignment will be centered in 145-foot wide corridor. These distances were used for the noise calculations. Results from the noise study indicate current and projected maximum audible noise levels of 46.2 dB (A) and 46.7 dB (A), respectively, at a distance of 70 feet from centerline, or the approximately the edge of the right-of-way.

The principle source of audible noise from electric transmission apparatuses is corona-associated noise from transmission lines, rather than substations. However, there is some noise associated with transformers in substations. Corona noise is a function of line voltage and conductor size. Because high-voltage transmission lines already exist within and near Eastshore substation and the voltage and conductors will not be changed, the audible noise from them will not increase as a result of RCEC going on-line. With the proposed radial connection of the RCEC, the Eastshore Substation will be expanded by adding additional breakers and bus work. No transformers will be added. There is little noise associated with a breaker unless it is operating (which occurs infrequently). The noise associated with the bus works is similar to that associated with a line. While the substation will expand as the result of additional equipment, the equipment will be similar to what already exists. This additional equipment will not be subject to increase in voltage or, where applicable, a change in conductor size and therefore,

will not generate additional noise. While noise quantification by analytical methods is beyond normal engineering practice, we expect any additional noise generated by new equipment to be masked by the existing sources.

## 8.10 SOCIOECONOMICS

***1. Local Taxes (12-month process [Appendix B(g)(7)(A)(i)]):***

*The economic characteristics, including the economic base, fiscal resources, and a list of the applicable local agencies with taxing powers and their most recent and projected revenues.*

***Information required to make AFC conform with regulations:***

*Please provide a list of the applicable local agencies with taxing powers and their most recent and projected revenues.*

**Response—** Table 8.10(s)-1 presents a summary of various tax revenues for the City of Hayward for the past fiscal year and projected revenue for the 2001-2002 fiscal year.

**Table 8.10(s)-1. City of Hayward tax revenue summary**

<b>Revenue Source</b>	<b>1999-2000 Actual Revenue (\$1,000)</b>	<b>2000-2001 Projected Revenue (\$1,000)</b>
Property Taxes	14,739	15,630
Sales Tax	29,484	32,900
Business Tax	1,812	1,800
Real Property Tax	3,815	4,900
Transient Occupancy Tax	1,367	1,400
Supplemental Improvement	1,798	1,700
Emergency Facilities Tax	1,727	1,700

Source: City of Hayward Finance Dept.

Following the deregulation of the California energy market in 1996 via AB 1890, there has been a shift between State and local control of property tax assessment for new power plants. Prior to passage of electricity deregulation legislation, electric generation, distribution, and transmission facilities were owned and operated by public utilities, and these facilities were subject to the State Board of Equalization (Board) assessment pursuant to Article XIII, Section 19 of the California Constitution. Following deregulation, however, the Board adopted Rule 905, under which the Board self-restricted its assessment jurisdiction to public utilities. County assessors were given assessment jurisdiction over any power plant built by a private company and any plant sold by a public utility to a private company after adoption of the rule in November 1999. Thus, under current practice, only public utilities are state-assessed.

There are differences in state-assessed (unitary) and county-assessed (local) property in the valuation method, revenue allocation, and value setting. Under State-assessed laws the valuation of a property is reassessed annually to determine a fair market value. For county-assessed properties, valuation is subject to the provisions of Article XIII A of the California State Constitution, and fair market value is determined at acquisition, with no more than a 2% increase in valuation for each year. Revenues are allocated to all jurisdictions in the county for a State-assessed property, whereas for a County-assessed property, revenues are allocated to only jurisdictions in the tax rate area where the property is located.

The Board members set the value of a property for a State-assessed property, whereas the County Assessor has the responsibility of determining the value of a property if assessed by the County.

Assembly Bill 81 (AB 81) authored by assemblyman Migden titled, "Property Taxation: Assessment of Electric Generation Facilities" was passed by the California State Assembly, and is currently in the State Senate. With the successful passing of AB 81, a shift in responsibility for assessing electric generation facilities with a generation capacity of 50 megawatts or more from local County assessors to the State Board of Equalization will occur. This law will become effective on January 1, 2002 if chaptered during 2001.

Local property tax revenue distribution for both the State (Unitary) and County (local) systems was compiled. Detailed tables are included at the end of this section showing the tax revenue distribution under each system.

Table 8.10(s)-2 presents a summary of distribution through the local tax system, which is currently in effect for new power plants. These revenue data are for Tax Rate Area 25028 (not the whole county), which will contain the RCEC. The total property tax revenues in Tax Rate Area 25028 in 2000 were \$7.8 million. The projected annual revenue contribution from the RCEC will range from \$3.0 to \$4.0 million, based on an estimated valuation range of \$300 to \$400 million and tax rate of 1.0065 percent. This contribution will significantly increase allocation amount to local agencies.

Table 8.10(s)-3 presents the property tax distribution for all of Alameda County based on the Unitary system. If AB 81 becomes effective, RCEC will likely be assessed and taxed by this system. As shown in the table, property taxes from the RCEC would be distributed to a much larger group of agencies throughout the entire county; therefore, the positive impact within the immediate community of the RCEC would be less significant. The total revenue generated by RCEC under this system would range from \$3.9 to \$5.1 million, based on a tax rate of 1.2841 percent.

## PROPERTY TAX SUMMARY TABLES

**Tabl 8.10(s)-2. Local property tax summary for Tax Rat Area 25028 (\$)**

Government Agency	Percent Allocation	2000 Property Tax Revenues	2001/2002 Projected Property Tax	RCFC Revenue Based on Assessed Value		RCFC Rev. Shifted on \$300M		RCFC Rev. Shifted on \$400M		RCFC Rev. After ERAF Shift based on \$400M	RCFC Rev. After ERAF Shift based on \$400M
				Based on \$300M Assessed Value	Based on \$400M Assessed Value	to ERAF based on \$300M	to ERAF based on \$400M	to ERAF based on \$300M	to ERAF based on \$400M		
County of Alameda	35.08%	2,742,742	2,962,162	1,059,179	1,412,238	371,538	691,008	687,641	721,230		
Chabot - Las Posittas Community College General	2.54%	198,497	214,377	76,655	102,206	1,946	2,595	74,709	99,611		
Hayward Unified School District General	20.32%	1,588,835	1,715,942	613,569	818,092	124,678	166,238	488,890	651,854		
School Institute of Pupils	0.17%	13,033	14,075	5,033	6,710	8	11	5,024	6,699		
Juvenile Hall Education	0.03%	2,698	2,914	1,042	1,389	0	0	1,041	1,389		
County Support School Service	0.10%	8,101	8,749	3,128	4,171	3	4	3,125	4,167		
County Support School Capital	0.08%	6,242	6,741	2,410	3,214	2	3	2,409	3,211		
School Development Center	0.10%	7,578	8,184	2,926	3,902	3	4	2,924	3,898		
School Audio Visual Capital	0.02%	1,625	1,754	627	836	0	0	627	836		
County Flood Control	0.21%	16,440	17,755	6,349	8,465	13	18	6,335	8,447		
Flood Zone 4	1.29%	100,545	108,588	38,828	51,771	499	666	38,329	51,105		
Bay Area Air Quality Management Dist	0.21%	16,452	17,768	6,353	8,471	13	18	6,340	8,453		
Mosquito Abatement	0.14%	10,968	11,845	4,236	5,647	6	8	4,230	5,639		
AC Transit SV 1	5.26%	411,449	444,365	158,891	211,855	8,361	11,148	150,530	200,707		
Bay Area Rapid Transit	0.62%	48,313	52,178	18,657	24,877	115	154	18,542	24,723		
Hayward Area Rec & Park	10.11%	790,336	853,563	305,208	406,944	9,018	41,133	296,190	365,810		
East Bay Regional Park 1	2.95%	231,023	249,505	89,215	118,954	18,531	3,515	70,684	115,439		
City of Hayward	20.77%	1,624,115	1,754,044	627,193	836,257	130,277	173,702	496,916	662,555		
<b>TOTALS</b>	<b>100%</b>	<b>7,818,991</b>	<b>8,444,510</b>	<b>3,019,500</b>	<b>4,026,000</b>	<b>665,014</b>	<b>1,090,225</b>	<b>2,354,486</b>	<b>2,935,775</b>		

<sup>1</sup> ERAF - Educational Revenue Augmentation Fund  
Source: Alameda County Tax Collector's Office

**Table 8.10(s)-3. Unitary property tax summary for Alameda County (\$)**

Government Agency	Percent Allocation	2000 Unitary Tax Revenues	2001/2002 Projected Tax Revenues	RCFC Revenue Based on \$300M Assessed Value	RCFC Revenue Based on \$400M Assessed Value	RCFC Rev. Shifted to ERAF based on \$300M	RCFC Rev. Shifted to ERAF based on \$400M	ERAF Rev. After RCFC Rev. Shift based on \$300M	ERAF Rev. After RCFC Rev. Shift based on \$400M	
County of Alameda	28.23%	7,974,045	8,611,968	1,087,671	1,450,228	532,197	709,597	555,474	740,631	
<b>SPECIAL DISTRICTS:</b>										
Alameda County Fire Department	0.75%	212,769	229,791	29,022	38,696			29,022	38,696	
Alaco Fire Zone #1 (C.V.)	0.01%	2,144	2,315	292	390	25	33	267	350	
Fairview	0.07%	18,403	19,875	2,510	3,347	549	733	1,961	2,614	
Alaco Fire Zone #2, Remon	0.00%	118	128	16	22	4	6	12	16	
Alaco Fire Zone #3, Castilewood	0.00%	892	964	122	162	33	44	88	118	
Alaco Fire Zone #4, Happy Vly	0.00%	557		76	101			76	101	
<b>FLOOD CONTROL/SOIL &amp; WATER CONSERVATION</b>										
Alameda Co. Resource Cons	0.01%	2,043	2,207	279	372	44	59	235	313	
Alameda Co. F.C. & W. C.	0.11%	30,078	32,485	4,103	5,470	1,632	2,176	2,471	3,295	
Flood Zone 2	0.17%	48,199	52,055	6,574	8,766	3,058	4,078	3,516	4,688	
Flood Zone 2A	0.01%	2,976	3,214	406	541	140	187	266	355	
Flood Zone 3A	0.12%	32,760	35,380	4,468	5,958	1,476	1,968	2,993	3,990	
Flood Zone 4	0.02%	5,421	5,854	739	986	255	340	484	646	
Flood Zone 5	0.19%	52,587	56,794	7,173	9,564	3,914	5,218	3,259	4,346	
Flood Zone 6	0.15%	41,522	44,844	5,664	7,552	1,953	2,605	3,710	4,947	
Flood Zone 7	0.23%	65,245	70,465	8,900	11,866	3,544	4,725	5,356	7,141	
Flood Zone 9	0.01%	1,857	2,005	253	338	125	167	128	171	
Flood Zone 12	0.40%	112,141	121,112	15,296	20,395	4,534	6,045	10,762	14,350	
Flood Zone 13	0.04%	12,132	13,102	1,655	2,206	179	239	1,476	1,968	
Byron Bethany Irrigation	0.02%	5,250	5,670	716	955			716	955	
<b>HEALTH</b>										
Alameda Co. Mosquito Abate	0.11%	31,566	34,091	4,307	5,742	1,634	2,179	2,673	3,564	
Bay Area Air Quality Management Dist.	0.18%	52,211	56,388	7,122	9,496			7,122	9,496	
<b>SANITARY</b>										
E.B.M.U.D. Special Dist. #1	0.18%	49,836	53,823	6,798	9,064			6,798	9,064	
Castro Valley	0.03%	7,434	8,038	1,014	1,352	406	541	608	811	
<b>ROAD</b>										
County Service Area R-1967	0.00%	254	275	35	46	14	18	21	28	
<b>RECREATION &amp; PARK</b>										
Hayward Area	1.34%	377,853	408,081	51,540	68,719	23,713	31,618	27,826	37,102	
Livermore Area	0.56%	158,893	171,604	21,673	28,898	10,446	13,929	11,227	14,969	
East Bay Regional	2.37%	670,623	724,272	91,474	121,965			91,474	121,965	
<b>LIBRARY SERVICES</b>										
County Library	0.78%	219,857	237,445	29,989	39,985	15,153	20,204	14,835	19,781	
County Library Sp. Tax Zone	0.02%	6,225	6,722	849	1,132	245	326	604	806	

Government Agency	Percent Allocation		2000 Unitary Tax Revenues		2001/2002 Projected Tax Revenues		RCFC Revenue Based on \$300M Assessed Value		RCFC Rev. Shifted to ERAF. Shifted on \$300M		RCFC Rev. After ERAF Smt. based on \$300M		RCFC Rev. After ERAF Smt. based on \$400M	
<b>TRANSIT</b>														
AC Transit Special Svc #1	2.71%	764,890	826,081	104,332	139,109	104,332	139,109	104,332	139,109	104,332	139,109	104,332	139,109	
AC Transit Special Svc. #2	0.48%	134,728	145,506	18,377	24,503	18,377	24,503	18,377	24,503	18,377	24,503	18,377	24,503	
SF-BART	0.54%	153,376	165,646	20,921	27,894	20,921	27,894	20,921	27,894	20,921	27,894	20,921	27,894	
<b>WATER</b>														
Alameda County	0.26%	73,742	79,642	10,059	13,411	10,059	13,411	3,725	4,966	6,334	8,445	6,334	8,445	
E.B.M.U.D.	0.64%	181,095	195,583	24,702	32,936	24,702	32,936			24,702	32,936	24,702	32,936	
<b>LIGHTING</b>														
County Service Area SL-1970	0.00%	5	5	1	1	1	1							
County Service Area SL-1972	0.00%	98	106	13	18	13	18	5	7	8	11	8	11	
<b>POLICE</b>														
County Serv Area PPI991-1	0.08%	22,974	24,812	3,134	4,178	3,134	4,178			3,134	4,178	3,134	4,178	
<b>TOTAL SPECIAL DISTRICTS</b>	12.58%	3,552,754	3,836,373	484,602	646,136	484,602	646,136	76,808	102,410	407,794	543,725	407,794	543,725	
<b>CITIES</b>														
Alameda	0.77%	216,863	234,212	29,580	39,441	29,580	39,441	6,043	8,058	23,537	31,383	23,537	31,383	
Albany	0.26%	73,235	79,094	9,989	13,319	9,989	13,319	2,556	3,408	7,433	9,911	7,433	9,911	
Berkeley	1.98%	560,353	605,181	76,433	101,911	76,433	101,911	14,667	19,557	61,765	82,354	61,765	82,354	
Dublin	0.27%	75,084	81,090	10,242	13,655	10,242	13,655	975	1,300	9,267	12,355	9,267	12,355	
Emeryville	0.17%	46,978	50,736	6,408	8,544	6,408	8,544	424	565	5,984	7,979	5,984	7,979	
Fremont	2.19%	617,510	666,911	84,229	112,306	84,229	112,306	18,623	24,831	65,606	87,475	65,606	87,475	
Hayward	2.23%	629,135	679,466	85,815	114,420	85,815	114,420	20,767	27,690	65,048	86,730	65,048	86,730	
Livermore	0.78%	219,845	237,432	29,987	39,983	29,987	39,983	7,143	9,524	22,844	30,459	22,844	30,459	
Newark	0.32%	90,433	97,667	12,335	16,447	12,335	16,447	2,990	3,987	9,345	12,460	9,345	12,460	
Oakland	8.15%	2,300,810	2,484,874	313,834	418,445	313,834	418,445	67,129	89,505	246,705	328,940	246,705	328,940	
Piedmont	0.19%	54,815	59,200	7,477	9,969	7,477	9,969	1,103	1,470	6,374	8,499	6,374	8,499	
Pleasanton	1.68%	474,861	512,850	64,772	86,362	64,772	86,362	11,057	14,742	53,715	71,620	53,715	71,620	
San Leandro	0.76%	214,175	231,309	29,214	38,952	29,214	38,952	6,228	8,305	22,985	30,647	22,985	30,647	
Union City	0.61%	171,318	185,024	23,368	31,157	23,368	31,157	5,761	7,683	17,605	23,474	17,605	23,474	
<b>TOTAL CITIES</b>	20.34%	5,745,415	6,205,048	783,683	1,044,910	783,683	1,044,910	165,468	220,624	618,214	824,286	618,214	824,286	
<b>SCHOOLS</b>														
<b>County Supt. Schools Sp. Funds</b>														
Audio-Visuals Capital	0.01%	3,686	3,981	503	670	503	670			503	670	503	670	
County Supt. Service	0.09%	25,711	27,768	3,507	4,676	3,507	4,676			3,507	4,676	3,507	4,676	
County Supt Capital	0.07%	19,809	21,394	2,702	3,603	2,702	3,603			2,702	3,603	2,702	3,603	
Develop. Center HDCP Pupil	0.07%	18,373	19,843	2,506	3,342	2,506	3,342			2,506	3,342	2,506	3,342	
Education Insur Pupils	0.15%	41,383	44,694	5,645	7,526	5,645	7,526			5,645	7,526	5,645	7,526	
Education Phys. HDCP Pupil	0.09%	26,827	28,973	3,659	4,879	3,659	4,879			3,659	4,879	3,659	4,879	
Education T.M.R., EC 1887	0.04%	7,199	7,774	1,367	1,823	1,367	1,823			1,367	1,823	1,367	1,823	
Juvenile Hall Education	0.03%	8,558	9,243	1,167	1,556	1,167	1,556			1,167	1,556	1,167	1,556	
T.M.R. & P.H. Capital	0.00%	597	645	81	109	81	109			81	109	81	109	

Government Agency	Percent Allocation	2000 Unitary Tax Revenues	2001/2002 Projected Tax Revenues	RGCC Revenue Assessed Value Based on \$300M	RGCC Revenue Assessed Value Based on \$400M	RGCC Rev. Shifted on \$300M to ERAF based on \$400M	RGCC Rev. Shifted on \$300M to ERAF based on \$400M	RGCC Rev. After ERAF Shift based on \$400M	RGCC Rev. After ERAF Shift based on \$400M
T.M.R. & P.H Tuition	0.01%	3,622	3,912	494	6,599			494	6,599
<b>ELEMENTARY</b>									
Mountain House	0.15%	41,504	44,824	5,661	7,548			5,661	7,548
<b>UNIFIED</b>									
Alameda	0.48%	136,398	147,310	18,605	24,807			18,605	24,807
Albany	0.22%	62,626	67,636	8,542	11,390			8,542	11,390
Berkeley	0.93%	262,197	283,172	35,764	47,685			35,764	47,685
Castro Valley	0.33%	93,313	100,778	12,728	16,971			12,728	16,971
Dublin	0.50%	141,818	153,163	19,344	25,792			19,344	25,792
Emery	0.09%	25,438	27,473	3,470	4,626			3,470	4,626
Fremont	2.31%	652,969	705,207	89,066	118,755			89,066	118,755
Hayward	2.07%	584,054	630,778	79,666	106,221			79,666	106,221
Livermore Valley JT	1.14%	322,453	348,249	43,983	58,644			43,983	58,644
New Haven	0.60%	170,158	183,770	23,210	30,946			23,210	30,946
Newark	0.32%	91,274	98,576	12,450	16,600			12,450	16,600
Oakland	4.40%	1,242,965	1,342,403	169,542	226,056			169,542	226,056
Piedmont	0.12%	34,493	37,252	4,705	6,273			4,705	6,273
Pleasanton	1.55%	438,144	473,195	59,763	79,685			59,763	79,685
San Leandro	0.74%	207,838	224,465	28,349	37,799			28,349	37,799
San Lorenzo	0.52%	148,128	159,978	20,205	26,940			20,205	26,940
Sunol	0.12%	33,382	36,052	4,553	6,071			4,553	6,071
<b>COMMUNITY COLLEGE</b>									
Fremont-Newark	0.49%	138,735	149,834	18,924	25,232			18,924	25,232
Peralta	0.89%	252,202	272,378	34,401	45,868			34,401	45,868
Chabot-Los Positas	1.03%	291,427	314,742	39,751	53,001			39,751	53,001
<b>SAN JOAQUIN COUNTY DISTRICTS</b>									
Tracy High	0.15%	42,707	46,124	5,825	7,767			5,825	7,767
San Joaquin Delta Community	0.06%	15,713	16,970	2,143	2,858			2,143	2,858
<b>TOTAL SCHOOLS</b>	<b>19.78%</b>	<b>5,583,702</b>	<b>6,032,558</b>	<b>762,283</b>	<b>1,016,377</b>			<b>762,283</b>	<b>1,016,377</b>
Education Rev. Augmentation Fund:	3.39%	956,297	1,032,800	130,440	173,920			130,440	173,920
Spec. Dist Augmentation Fund	1.94%	548,608	592,497	74,831	99,775			74,831	99,775
<b>REDEVELOPMENT AGENCIES</b>									
Alameda Co & San Leandro J	0.01%	4,214	4,551	575	766			575	766
Alameda: West End IMP	0.10%	29,337	31,684	4,002	5,335			4,002	5,335
Alameda Point IMP				0	0			0	0
Business and Wurfirt	0.01%	2,119	2,288	289	385			289	385
<b>TOTAL ALAMEDA</b>	<b>0.11%</b>	<b>31,455</b>	<b>33,972</b>	<b>4,291</b>	<b>5,721</b>			<b>4,291</b>	<b>5,721</b>
ALBANY: Cleveland Ave				0	0			0	0
Berkeley: Savo Island	0.01%	1,604	1,732	219	292			219	292
West Berkeley	0.04%	10,499	11,338	1,432	1,909			1,432	1,909

Government Agency	Percent Allocation	2000 Unitary Tax Revenues		2007/2008 Projected Tax Revenues		RCCEC Revenue Based on \$300M Assessed Value		RCCEC Revenue Based on \$400M Assessed Value		RCCEC Rev. Shifted to ERAF based on \$300M		RCCEC Rev. After ERAF Shift based on \$300M		RCCEC Rev. After ERAF Shift based on \$400M	
		2000 Unitary Tax Revenues	2007/2008 Projected Tax Revenues	RCCEC Revenue Based on \$300M Assessed Value	RCCEC Revenue Based on \$400M Assessed Value	RCCEC Rev. Shifted to ERAF based on \$300M	RCCEC Rev. Shifted to ERAF based on \$400M	RCCEC Rev. After ERAF Shift based on \$300M	RCCEC Rev. After ERAF Shift based on \$400M	RCCEC Rev. After ERAF Shift based on \$300M	RCCEC Rev. After ERAF Shift based on \$400M	RCCEC Rev. After ERAF Shift based on \$300M	RCCEC Rev. After ERAF Shift based on \$400M		
TOTAL BERKELEY	0.04%	12,102	13,070	1,651	2,201			1,651	2,201			1,651	2,201		
Emeryville	0.25%	69,643	75,214	9,499	12,666			9,499	12,666			9,499	12,666		
Shelburne	0.02%	4,518	4,879	616	822			616	822			616	822		
TOTAL EMERYVILLE	0.26%	74,161	80,093	10,116	13,487			10,116	13,487			10,116	13,487		
Fremont: Nites	0.01%	2,684	2,899	366	488			366	488			366	488		
Industrial	1.17%	330,415	356,848	45,069	60,092			45,069	60,092			45,069	60,092		
Irvington	0.06%	17,600	19,008	2,401	3,201			2,401	3,201			2,401	3,201		
Centerville	0.00%	26	29	4	5			4	5			4	5		
TOTAL FREMONT	1.24%	350,726	378,784	47,840	63,786			47,840	63,786			47,840	63,786		
Hayward: Downtown	1.61%	455,289	491,713	62,102	82,803			62,102	82,803			62,102	82,803		
Livermore	0.03%	9,692	10,468	1,322	1,763			1,322	1,763			1,322	1,763		
Oakland: Acorn	0.12%	33,281	35,943	4,540	6,053			4,540	6,053			4,540	6,053		
Central Dist	10.08%	2,847,835	3,075,662	388,449	517,932			388,449	517,932			388,449	517,932		
Coliseum (Elmhurst)	0.06%	16,728	18,066	2,282	3,042			2,282	3,042			2,282	3,042		
Oak Center	0.06%	16,346	17,653	2,230	2,973			2,230	2,973			2,230	2,973		
Standford/Adeline	0.01%	3,573	3,858	487	650			487	650			487	650		
TOTAL OAKLAND	10.33%	2,917,762	3,151,183	397,987	530,649			397,987	530,649			397,987	530,649		
San Leandro: Plaza 1	0.01%	3,199	3,455	436	582			436	582			436	582		
Plaza 2	0.04%	11,139	12,030	1,519	2,026			1,519	2,026			1,519	2,026		
TOTAL SAN LEANDRO	0.05%	14,338	15,485	1,956	2,608			1,956	2,608			1,956	2,608		
Union City Community	0.03%	9,815	10,600	1,339	1,785			1,339	1,785			1,339	1,785		
<b>TOTAL REDEVELOPMENT</b>	<b>13.74%</b>	<b>3,879,535</b>	<b>4,189,920</b>	<b>529,177</b>	<b>705,569</b>			<b>529,177</b>	<b>705,569</b>			<b>529,177</b>	<b>705,569</b>		
<b>GRAND TOTAL</b>	<b>100%</b>	<b>28,242,376</b>	<b>30,501,165</b>	<b>3,852,686</b>	<b>5,136,915</b>	<b>774,473</b>	<b>1,032,631</b>	<b>3,078,213</b>	<b>4,104,284</b>						

1 ERAF - Educational Revenue Augmentation Fund  
Source: Alameda County Auditor-Controller Office

## 8.13 VISUAL RESOURCES

### *1. General Plan Update (6-month expedited process [§2022(b)(1)(C)]):*

*Where a standard, ordinance, or law is expected to change between the time of filing an application and certification, information from the responsible jurisdiction documenting the impending change, the schedule for enactment of the change, and whether the proposed project will comply with the changed standard, ordinance, or law.*

### *Information required to make AFC conform with regulations:*

*Page 8.6-9 of the AFC states that the City of Hayward is conducting an update of the -General Plan to be completed during 2001. The visual section of the AFC does not indicate whether the proposed project will comply with the goals, policies, guidelines and standards of the updated General Plan. Please provide information from the City of Hayward documenting the impending change, the schedule for enactment of the change, and whether the proposed project will comply with the goals, policies, guidelines, and standards related to visual resources of the updated General Plan.*

**Response**—The City of Hayward is in the process of comprehensively revising the General Plan for the first time since 1985. The City's intention is to adopt a new Plan that will provide appropriate guidance for future growth and development for the next twenty years. The City identified major issues to be addressed in late 2000 and has been evaluating these issues along with alternatives for dealing with them on an ongoing basis throughout late 2000 and 2001. Draft goals, policies, and implementation strategies are currently being reviewed. The City's completion date goal for the draft General Plan document and Draft Environmental Impact Report is July or August, 2001. Public review is scheduled for October 2001. Planning Commission and City Council public hearings are planned for November and December 2001, respectively. This information is provided by the City of Hayward on their website at [www.ci.hayward.ca.us/generalplan/index.html](http://www.ci.hayward.ca.us/generalplan/index.html).

Specific issues of concern pertaining to the Industrial Corridor are identified in an agenda report prepared by the City titled *The New Economy and the Transformation of the Industrial Corridor*. This report is available at [www.ci.hayward.ca.us/generalplan/backgroundreports.html](http://www.ci.hayward.ca.us/generalplan/backgroundreports.html). Six primary issues were identified for evaluation by the City Council and Planning Commission:

1. Implementing multiple zoning districts within the Industrial Corridor to better segregate manufacturing and warehousing uses from high technology uses.
2. Potential segregation of uses, such as heavy industrial, high technology, and biotechnology uses that use hazardous and toxic materials, from residential uses; and segregation of child care facilities to areas not exposed to hazardous materials, yet near the employment centers of the Industrial Corridor.
3. Possible use of overlay zones in the Industrial Corridor to require a higher minimum number of parking spaces for all new construction. This would prevent future parking shortages as low employment intensity uses (such as warehousing uses) are later converted to more intensive uses.

4. Possible permitting of on-street parking in some areas, to relieve parking congestion caused by conversion of warehouses to more intensive development.
5. Institution of higher minimum parcel sizes for some types of industrial development to encourage the siting of manufacturing and research and development operations that require larger parcels for development.
6. Placing a higher priority on public transit to and within the Industrial Corridor.

Based on the proposed key issues identified in the City's guidance documents for the updated General Plan, the RCEC is likely to remain compatible with the General Plan and the planning goals for the City of Hayward after the new plan is published. The RCEC project would be consistent with current City planning trends in relation to the six key revised General Plan issues listed above as follows:

1. **Multiple zoning districts**— If the City subdivides the Industrial Corridor into separate zones for manufacturing and high technology, the RCEC and its surrounding area would very likely fit into a manufacturing zone. The City's WPCF, the Rohm and Haas paint polymers plant, Tuscarora industries, Mags Trucking, and many other manufacturing and warehousing uses surround the RCEC project site.
2. **Segregation of Uses**—The RCEC would use hazardous materials but is located nearly a mile from the nearest residence. Transportation routes between the RCEC and nearest controlled-access highway do not pass adjacent to residential areas.
3. **Overlay zones for parking**— The RCEC does not involve the conversion of warehouses to uses of more intensive employment and hence will not cause a parking concern. All of the parking spaces necessary for RCEC operations staff will be located within the plant boundary.
4. **On-Street Parking**—As with #3, the RCEC does not involve the conversion of warehouses to uses of more intensive employment and hence will not cause a parking concern. On-street parking will not be necessary for the RCEC.
5. **Higher minimum parcel size**—The RCEC project involves consolidating two parcels for a total of 14.7 acres and will thus help preserve parcel size for future manufacturing and industrial uses.
6. **Public Transit**—Increased use of public transit would help to reduce traffic congestion in the Industrial Corridor and would provide more transit options for RCEC employees.

The General Plan revision guidance documents that the City of Hayward has published to date do not address changes in the City's goals for visual resources management or in zoning regulations that have to do with lot setbacks or height limits. The City's policy has in the past been not to impose height limits to structures, possibly to permit large structures that may be necessary for some kinds of industrial concerns (such as the Rohm and Haas paint polymers plant stack, the RCEC, etc.). There is no indication in the guidance documents that the City would impose height limits or additional lot setback requirements for the sake of visual resources management in the Industrial Corridor. Though it is possible that changes in the zoning regulations could accompany the segregation of uses (sub-zones in the Industrial Corridor), it is most likely that requirements would not change in the area in which the RCEC is located (assuming that the RCEC and its surroundings would become a manufacturing and warehousing zone).

**2. KFAX Tower Relocation (12-month process [Appendix B(g)(1)]):**

*...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.*

**Information required to make AFC conform with regulations:**

*Four, 228-foot tall KFAX Radio towers currently occupy the project site. These towers would be relocated as a result of the project. The AFC indicates that the City of Hayward is currently preparing an environmental document in compliance with CEQA that addresses the removal and relocation of the towers and that the City expects to complete their review by mid summer 2001. However, the AFC should discuss the visual impacts of the relocated radio towers as an indirect impact of the proposed power plant project. If a draft environmental document is available, it should be provided to staff as part of this data adequacy determination.*

**Response—**The CEC has determined that the radio tower relocation would be a separate project from the RCEC, outside of the CEC's jurisdiction, partly because of the Federal Communications Commission's action of licensing the new transmitter. The visual resources effects of the new transmitter site are addressed in the City's Initial Study. Copies of the City of Hayward's Initial Study and CEQA Mitigated Negative Declaration addressing KFAX radio tower relocation are included at the end of this section.

## **CITY OF HAYWARD INITIAL STUDY**



## Environmental Checklist Form

1. Project title: **Use Permit 01-160-11 to Raze existing KFX Radio Station Transmitter Facilities from Enterprise Avenue and Relocate them to near the western terminus of West Winton Avenue.**
2. Lead agency name and address: **City of Hayward**
3. Contact person and phone number: **Dyana Anderly, AICP, Planning Manager, 510.583.4214**
4. Project location:  
**The project location is on the eastern panhandle area of the closed Old West Winton landfill, located near the western terminus of West Winton Avenue. The City of Hayward owns the property.**
5. Project sponsor's name and address: **Golden Gate Broadcasting Co., Inc.**
6. General plan designation: **"Industrial" and "Baylands"**
7. Zoning: **"Industrial" and "Floodplain"**
8. Description of project:  
**The project consists of construction of four, 228-foot-high (above ground) self-supporting AM radio transmitter facilities and associated transmitter facilities on the proposed location near the western terminus of West Winton Avenue, and removal of the existing KFX transmitter facilities from their current location at 3636 Enterprise Avenue, opposite the City's waste water treatment plant. While the existing towers are supported by "guy" wires, the proposed new towers will be self-supporting monopoles.**
9. Surrounding land uses and setting:  
**The City's wastewater treatment ponds are located immediately to the south. A large, closed landfill is located to the southwest. The Alameda County flood control channel and the All Cities Landfill, a landfill in the process of being closed and capped, lie to the north. To the east is developed area zoned Industrial that contains industrial and office uses and several automobile salvage yards. Further west, towards San Francisco Bay are the Hayward Regional Shoreline Hiking Trails.**
10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

**Alameda County Flood Control and Water Conservation District  
Federal Communications Commission  
Federal Aviation Administration  
San Francisco Bay Regional Water Quality Control Board**

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Aesthetics           | <input type="checkbox"/> Agriculture Resources              | <input type="checkbox"/> Air Quality                       |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology /Soils                    |
| <input type="checkbox"/> Hazards & Hazardous Materials   | <input type="checkbox"/> Hydrology / Water Quality          | <input checked="" type="checkbox"/> Land Use / Planning    |
| <input type="checkbox"/> Mineral Resources               | <input type="checkbox"/> Noise                              | <input type="checkbox"/> Population / Housing              |
| <input type="checkbox"/> Public Services                 | <input type="checkbox"/> Recreation                         | <input checked="" type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities / Service Systems     | <input type="checkbox"/> Mandatory Findings of Significance |  |

**DETERMINATION:**

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

Sylvia Ehrental  
Printed Name

May 24, 2001  
Date

City of Hayward  
Agency

# ENVIRONMENTAL ISSUES:

<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
---	--	---	----------------------

## I. AESTHETICS -- Would the project:

a) Have a substantial adverse effect on a scenic vista?

**Comment:** The existing KFAQ radio transmitter facilities are situated within view of the Hayward shoreline area and State Route 92; therefore, replacing them with new towers at another location that is similarly visible from the shoreline will not have a significant negative visual impact as viewed from strategic viewpoints. In addition, the existing KFAQ towers are supported by guy wires, whereas the new towers will be self-supporting monopoles. This design will further reduce their visual impact. As the towers are tall, thin, will be finished in galvanized gray, and are of lattice construction, they will recede into view to some extent. Although the presence of radio towers changes the composition of the view somewhat, the radio towers do not substantially change either the view's character or quality. As viewed from a distance 0.5 miles from the proposed site, the lower third of the towers would be visually absorbed into the backdrop provided by the distant ridgeline of the East Bay hills. Because they are so thin, the upper portions of the towers recede into the sky behind them.

The new facilities will include a transmitter equipment enclosure and small electronics enclosures at the base of each radio transmission tower. These transmitter equipment enclosures will be constructed of concrete masonry units using a decorative finish such as slumpstone, non-glare roof materials, and will be finished with earth tone paint. They will also be required to be as small as possible. A small pre-fabricated metal equipment cabinet will be installed near the base of each tower. These cabinets will also be finished in earth-tone paint.

Fencing surrounding the structures will be vinyl clad chain-link or better and of a color to blend with the surroundings.

The site will continue to be covered with native grasses.

- |  | <i>Potentially<br/>Significant<br/>Impact</i> | <i>Potentially<br/>Significant<br/>Unless<br/>Mitigation<br/>Incorporation</i> | <i>Less Than<br/>Significant<br/>Impact</i> | <i>No<br/>Impact</i>     |
|--|---|--|---|--------------------------|
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | <input type="checkbox"/>                      | <input checked="" type="checkbox"/>  | <input type="checkbox"/>                    | <input type="checkbox"/> |

**Comment:** The new radio transmitter facilities would be located on a former landfill, where there are no significant trees, rock outcroppings, or historic buildings. With regard to the views of the bay and shoreline, see I a) above.

- |   |                          |                                     |                          |                          |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|

**Comment:** See I a) above.

- |   |                          |                                     |                          |                          |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|

**Comment:** Aircraft warning lights will be required to alert aircraft of the location of the radio transmitter facilities. These lights will be white strobes. These strobe lights will be similar to those in the use on the nearby KTCT transmitter towers. The new aircraft warning lights will not have a significant visual impact as viewed from ground level. Project light fixtures necessary for safety, security, and operations and will be shielded from public view, and non-glare fixtures and the use of switches, sensors, and timers will be used to minimize the time that lights not needed for safety and security are on.

**II. AGRICULTURE RESOURCES:** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

**Comment:** As a former landfill site with a clay cap, the site does not have significant value for agricultural uses and has not been used for this purpose in the past. Irrigation to the site for agricultural purposes could compromise the integrity of the protective surface of the former landfill.

- |  | <i>Potentially<br/>Significant<br/>Impact</i> | <i>Potentially<br/>Significant<br/>Unless<br/>Mitigation<br/>Incorporation</i> | <i>Less Than<br/>Significant<br/>Impact</i> | <i>No<br/>Impact</i>                |
|--|---|--|---|-------------------------------------|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/>                      | <input type="checkbox"/>   | <input type="checkbox"/>                    | <input checked="" type="checkbox"/> |

**Comment:** See II above.

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** See II above.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** see II above.

**III. AIR QUALITY** -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** Access to the site during construction and for maintenance purposes will be required to be surfaced with a material that prevents, to the extent possible, vehicles from tracking mud and dust onto public streets. In addition, wheels may be required to be washed before entering the public street. With the cited mitigation in place, there will be no significant adverse air quality impacts.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comment:** The project is not expected to contribute toward air pollution, and there are no sensitive receptors in the vicinity of the project.

Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**IV. BIOLOGICAL RESOURCES** -- Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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**Comment:**

Special environmental areas in the vicinity of the site include a brackish slough that drains into Hayward Landing, managed by the Hayward Area Park and Recreation District. Biological field surveys for the project were conducted by biologist Brett D. Hartman on February 27 and March 25, 2001. The entire project site was surveyed intensively, and biological reconnaissance of an area within one mile of the project site was also conducted.

Ruderal species such as wild barley (*Hordeum leporinum*) ripgut grass (*Bromus diandrus*), and black mustard (*Brassica nigra*) dominate the site. These grasses that are not candidate, sensitive, or special status species.

Listed animal species in the area include the salt marsh harvest mouse (*Reithrodontomys raviventris*) clapper rail (*Rallus longirostris obsoletus*) and salt-marsh wandering shrew (*Sorex vagrans halicoetes*); however, no supporting habitat or other evidence that the site benefits these species was found on the site. Bird species observed on the site included red-winged black birds, barn swallows, and Canada geese.

Relocation of the radio transmitter facilities could result in the loss of individuals of several wildlife species that occupy this site or are dependent upon this site for specific physiological and ecological requirements. However, these species are common to many areas, have no regulatory protective status, and are primarily limited to burrowing rodents (i.e., ground squirrel [*Spermophilus sp.*], pocket gophers [*Thomomys sp.*], and voles [*Microtis sp.*]). As a former landfill site with a clay cap, the integrity of the cap is essential in maintaining the integrity of the landfill. In order to insure that burrowing animals do not occupy the site and to reduce weeds, the site is disced each year. Therefore, the likelihood that the site provides habitat for protected species is remote.

<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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Monitoring of construction activities will be carried out by personnel trained to detect any potential and unforeseen impacts on listed, sensitive, or migratory wildlife and their habitats adjacent to the site. If actual or potential effects are detected, the construction foreman will cease the activities that are potentially affecting these species and will consult with a professional biologist qualified to assess the situation and make recommendations to alter or alleviate any activities that are resulting in these effects.

Impacts to wildlife due to the radio transmitter facilities towers will be mitigated through the use of self-supporting supporting broadcast towers. Impacts to wildlife due to collisions with the transmitter facilities are not expected to be significant. Inspections of the current radio transmission tower site over a period of years by maintenance personnel did not reveal evidence that wildlife that had died or had been injured by collisions with the radio transmitter facilities. While literature linked to collisions of migratory birds with radio transmitter facilities suggests that impacts may occur when the towers are obscured by fog, the Hayward shoreline area is rarely effected by fog.

Biologists will conduct additional field surveys in June for the Hispid's birds beak, Point Reyes bird's beak, and Delta tule pea. In the event that these plants are identified on the site during their blooming phases, additional consultation with regulatory agencies and mitigation planning will be undertaken to ensure that any potential impact to these species is mitigated to a level below significance.

- |  |                          |                          |                                     |                          |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

**Comment:** See IV a) above.

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** There are no identified wetlands on that portion of the project site that will be occupied by radio transmitter facilities or their associated apparatus.

- |  | <i>Potentially<br/>Significant<br/>Impact</i> | <i>Potentially<br/>Significant<br/>Unless<br/>Mitigation<br/>Incorporation</i> | <i>Less Than<br/>Significant<br/>Impact</i> | <i>No<br/>Impact</i>     |
|--|---|--|---|--------------------------|
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | <input type="checkbox"/>                      | <input type="checkbox"/>   | <input checked="" type="checkbox"/>         | <input type="checkbox"/> |

**Comment:** See IV a) above.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Comment:** See IV a) above.

**V. CULTURAL RESOURCES -- Would the project:**

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** The radio transmitter facilities will be located on a portion of a former landfill which is filled with many thousands of yards of household garbage. There is approximately 2 feet of fill overlying the clay cap that covers the landfill. The landfill is not known to contain any significant historical resources, and driving foundation pilings for the towers will not expose any potential historical resources.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** Radio transmitter facilities will be located on a portion of a former landfill containing household refuse. There is no reason to suspect that the landfill contains any significant archaeological resources.

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comment:** Radio transmitter facilities will be located on a portion of a former landfill containing household refuse. The landfill does not contain any paleontological resources and the driving foundation pilings for the towers will not expose any potential paleontological resources.

d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**Comment:** Radio transmitter facilities will be located on a portion of a former landfill. There is no reason to believe that the landfill contains any human remains.

**VI. GEOLOGY AND SOILS -- Would the project:**

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**Comment:** The site is not within the Earthquake Hazard Zone. The Hayward Fault passes about 4 miles northeast of the site, while the San Andreas Fault passes about 14 miles southwest of the site.

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comment:</b> Damage to the towers and transmitter buildings from high levels of ground shaking will be substantially reduced by requiring proper seismic design. To reduce structural damage due to continuing consolidation of fill, pile foundations will be required to be designed to include the negative friction (downdrag) imposed by consolidation of the upper 20 feet of material and tower pads and pilings will be designed in accordance with CBC, Seismic Zone 4 requirements.				
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comment:</b> See VI a) i) above. Tower pads will be designed to withstand the strong ground motion and ground failure (liquefaction) of a design earthquake.				
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Comment:</b> See VI a) i) above.				
c) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Comment:</b> See VI a) i) above.				
d) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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**VII. HAZARDS AND HAZARDOUS MATERIALS** – Would the project:

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** No hazardous materials of a significant threshold are anticipated to be used at the site.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** The site will not be used for residential or employment purposes. Employees will visit the site only periodically for equipment maintenance purposes.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VIII. HYDROLOGY AND WATER QUALITY --** Would the project:

a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comment:** A drainage plan is required to be approved by the City Engineer prior to issuance of a building permit for the radio transmitter facilities and accessory structures. The San Francisco Bay Regional Water Quality Control Board also has authority over drainage on the site, and their approval is required before issuance of a building permit for construction of the radio transmitter facilities and accessory structures.

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comment:** A drainage plan is required to be approved by the City Engineer prior to issuance of a building permit for the radio transmitter facilities and accessory structures. The San Francisco Bay Regional Quality Control Board also has authority over the drainage system, and their approval of the project will be required prior to issuance of building permits for construction of the radio transmitter facilities and accessory structures.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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**Comment:** A drainage plan is required to be approved by the City Engineer prior to issuance of a building permit for the radio transmitter facilities and accessory structures.

f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**Comment:** The project requires approval of the San Francisco Bay Regional Water Quality Control Board which is required to be obtained prior to issuance of building permits for construction of the radio transmitter facilities and accessory buildings.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**Comment:** No housing is proposed.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>IX. LAND USE AND PLANNING - Would the project:</b>				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
 <b>Comment:</b> The approximately 14-acre parcel is classified as “Industrial” and “Open Space” by the General Plan Map. This designation does not necessarily preclude the location of uses such as towers. For example, P.G.&E. transmission lines and towers traverse many areas of the City designated as Open space, including the Shoreline and Walpert Ridge. The Zoning Map indicates that eastern portion of the parcel is within the Industrial District and the western portion is in the Flood Plain District. Towers have traditionally been allowed in the Industrial District. The Flood Plain district allows broadcast studios as a permitted use, but does not specifically mention radio towers. To accomplish relocation to this site, by certifying this environmental document, the approving body is determining that the radio transmitter facilities are essentially an element of the broadcasting function and thus similar in character and use to a broadcast studio.				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comment:** The San Francisco Bay Conservation and Development Commission has “bay” permit jurisdiction over all portions of the Bay that are subject to tidal action, and “shoreline band” permit jurisdiction over the first 100 feet of shoreline inland from the line of highest tidal action. Construction within the Commission’s jurisdiction would require a permit from the Commission; however, none of the proposed radio transmitter facilities are within the Commission’s shoreline band jurisdiction. As the site is entirely within a landfill, with on-site elevations of over 10 feet, there is no on-site tidal action.

<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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The site lies outside the City of Hayward's "Urban Limit Line." However, relocation of radio transmitter facilities to the project site is not inconsistent with the intent of the Urban Limit Line.

The Hayward Area Shoreline Planning Agency was formed in 1971 as an advisory agency to coordinate planning for the eight miles of shoreline between the Alameda Creek Flood Control Channel to the south and the San Leandro City limits to the north. The agency's advisory status was established under an intergovernmental joint exercise of powers agreement. The agencies participating in this Agreement are East Bay Regional Park District, Hayward Area Recreation and Park District, City of Hayward, Hayward Unified School District, and San Lorenzo Unified School District. On March 15, 2001, during a public meeting, members of the Hayward Area Shoreline Planning Agency did not take exception to reasoning that the Russell City Energy Center and the proposed new KFAX radio transmitter facilities at subject site would be consistent with the City's General Plan and zoning.

**X. MINERAL RESOURCES --** Would the project:

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

**Comment:** As a former landfill site, there are no known significant mineral resources.

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

**XI. NOISE -** Would the project result in:

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XII. POPULATION AND HOUSING -- Would the project:**

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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**XIII. PUBLIC SERVICES**

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comment:</b> Access for fire suppression equipment will be required to be maintained to the site for fire protection purposes.				
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIV. RECREATION --**

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XV. TRANSPORTATION/TRAFFIC --** Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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**Comment:** The only traffic associated with the project (outside the construction phase) is infrequent periodic maintenance vehicles.

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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- |   | <i>Potentially<br/>Significant<br/>Impact</i> | <i>Potentially<br/>Significant<br/>Unless<br/>Mitigation<br/>Incorporation</i> | <i>Less Than<br/>Significant<br/>Impact</i> | <i>No<br/>Impact</i>     |
|---|---|--|---|--------------------------|
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | <input type="checkbox"/>                      | <input checked="" type="checkbox"/>  | <input type="checkbox"/>                    | <input type="checkbox"/> |

**Comment:** The project site is approximately 4,900 feet from the nearest point of the nearest runway to the Hayward Executive Airport. Due to the proposed height of the radio transmitter facilities, Federal Aviation Administration (FAA) regulations require an airspace analysis by them. FAA approval is required before issuance of building permits for the radio transmitter facilities. In addition to evaluating the proposal with respect to the Hayward Executive Airport, the FAA analysis will include potential impacts and mitigation measures relative to air traffic approaching the Oakland International Airport.

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Result in inadequate emergency access?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) Result in inadequate parking capacity?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**XVI. UTILITIES AND SERVICE SYSTEMS – Would the project:**

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comment:** Other than during the construction phase of the project, there will not be a significant amount of solid waste associated with the radio transmitter facilities.

h) Result in radio interference with other transmitters and in receivers.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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**Comment:** The project requires FCC clearance before issuance of a building permit.

**XVII. MANDATORY FINDINGS OF SIGNIFICANCE --**

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------	-------------------------------------	--------------------------

	<i>Potentially Significant Impact</i>	<i>Potentially Significant Unless Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# **CITY OF HAYWARD MITIGATED NEGATIVE DECLARATION**



**DEPARTMENT OF  
COMMUNITY AND ECONOMIC DEVELOPMENT  
Development Review Services Division**

**MITIGATED NEGATIVE DECLARATION**

Notice is hereby given that the City of Hayward finds that no significant effect on the environment as prescribed by the California Environmental Quality Act of 1970, as amended will occur for the following proposed project:

**I. PROJECT DESCRIPTION:**

**USE PERMIT APPLICATION 01-160-11 – GOLDEN GATE BROADCASTING CO., INC. (APPLICANT), CITY OF HAYWARD (OWNER).** Request to construct four, 228-foot-high (above ground) self-supporting AM radio transmitter facilities and associated transmitter facilities on the proposed location near the western terminus of West Winton Avenue, and removal of the existing KFOX transmitter facilities from their current location at 3636 Enterprise Avenue, opposite the City's waste water treatment plant. While the existing towers are supported by "guy" wires, the proposed new towers will be self-supporting monopoles.

**II. FINDING PROJECT WILL NOT SIGNIFICANTLY AFFECT ENVIRONMENT:**

The proposed project, as conditioned, will have no significant effect on the area's resources, cumulative or otherwise.

**III. FINDINGS SUPPORTING DECLARATION:**

1. The project application has been reviewed according to the standards and requirements of the California Environmental Quality Act (CEQA) and an Initial Study Environmental Evaluation Checklist has been prepared for the proposed project. The Initial Study has determined that the proposed project, with the recommended mitigation measures, could not result in significant effects on the environment.
2. The project is in conformance with the General Policies Plan Map designations of "Industrial" and "Baylands" as these designations do not necessarily preclude the location of uses such as towers.
3. The project is in conformance with the intent and purpose of the Zoning Ordinance designation of "Industrial" and "Floodplain" in that eastern portion of the parcel is within the Industrial District and the western portion is in the Flood Plain District. Towers have traditionally been allowed in the Industrial District. The Floodplain district allows broadcast studios as a permitted use, but does not specifically mention radio towers. To accomplish relocation to this site, by certifying this environmental document, the approving body is determining that the radio transmitter facilities are essentially an

element of the broadcasting function and thus similar in character and use to a broadcast studio.

4. Impacts to wildlife due to the radio transmitter facilities towers will be mitigated through the use of self-supporting supporting broadcast towers. Impacts to wildlife due to collisions with the transmitter facilities are not expected to be significant. Inspections of the current radio transmission tower site over a period of years by maintenance personnel did not reveal evidence that wildlife that had died or had been injured by collisions with the radio transmitter facilities. While literature linked to collisions of migratory birds with radio transmitter facilities suggests that impacts may occur when the towers are obscured by fog, the Hayward shoreline area is rarely effected by fog.
5. Radio transmitter facilities will be located on a portion of a former landfill containing household refuse. There is no reason to suspect that the landfill contains any significant archaeological, paleontological, or agricultural resources.
6. Requiring proper seismic design will substantially reduce damage to the towers and transmitter buildings from high levels of ground shaking. To reduce structural damage due to continuing consolidation of fill, pile foundations will be required to be designed to include the negative friction (downdrag) imposed by consolidation of the upper 20 feet of material and tower pads and pilings will be designed in accordance with CBC, Seismic Zone 4 requirements.
7. A drainage plan is required to be approved by the City Engineer prior to issuance of a building permit for the radio transmitter facilities and accessory structures. The San Francisco Bay Regional Water Quality Control Board also has authority over drainage on the site, and their approval is required before issuance of a building permit for construction of the radio transmitter facilities and accessory structures.
8. The project site is approximately 4,900 feet from the nearest point of the nearest runway to the Hayward Executive Airport. Due to the proposed height of the radio transmitter facilities, Federal Aviation Administration (FAA) regulations require an airspace analysis by them. FAA approval is required before issuance of building permits for the radio transmitter facilities. In addition to evaluating the proposal with respect to the Hayward Executive Airport, the FAA analysis will include potential impacts and mitigation measures relative to air traffic approaching the Oakland International Airport.

**IV. PERSON WHO PREPARED INITIAL STUDY:**

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Sylvia Ehrenthal, Director of Community and Economic Development

Dated: May 24, 2001

**V. COPY OF INITIAL STUDY IS ATTACHED**

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For additional information, please contact the City of Hayward Development Review Services Division, 777 B Street, Hayward, CA 94541-5007 or telephone (510) 583-4213

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**DISTRIBUTION/POSTING**

- Provide copies to project applicants and all organizations and individuals requesting it in writing.
- Reference in all public hearing notices to be distributed 30 days in advance of initial public hearing and/or published once in Daily Review prior to hearing.
- Project file.
- Post immediately upon receipt at the City Clerk's Office, the Main City Hall bulletin board, and in all City library branches, and do not remove until the date after the public hearing.

## 8.15 WATER RESOURCES

### **1. Report of Waste Discharge (6 and 12-month processes [Appendix B (g)(14)(A)(i), §2022(b)(1)(B)]):**

All information required by the Regional Water Quality Control Board in the region where the project will be located to apply for: Waste Discharge Requirements; and

#### **Information required to make AFC conform with regulations:**

According to the SFBRWQCB, any effluent discharged beyond the headworks of a waste treatment facility is treated as a separate discharge. Because this will be the case for the RCEC project, the applicant needs to submit a complete Report of Waste Discharge (ROWD) in order for the RWQCB to issue WDRs in the form of an NPDES permit. Please provide a complete ROWD that would enable the RWQCB to initiate the permit review process. Energy Commission staff has requested a letter from the SFBRWQCB regarding the status of an ROWD submission by the Applicant.

**Response**—The attached letter from Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward, to the Regional Water Quality Control Board explains that, as a recycled waste stream internal to the City of Hayward's treatment works, the RCEC project would not require a separate NPDES permit. The effluent from the project would, instead, be discharged under the existing East Bay Dischargers Authority (EBDA) permit, as City of Hayward Water Pollution Control Facility effluent.

### **2. NPDES Permit (6-month and 12-month processes [Appendix B (g)(14)(A)(ii), §2022(b)(2)(E)]):**

All information required by the Regional Water Quality Control Board in the region where the project will be located to apply for a National Pollutant Discharge Elimination System Permit.

#### **Information required to make AFC conform with regulations:**

As per Appendix B (g) (14) (A) (i), the RCEC would be treated as a separate discharge and will be handled by an NPDES permit for wastewater discharge. Provide a discussion on the aforementioned permit regarding applicability and conformance issues.

**Response**—See response to #1 above, and the letter from the City of Hayward to the Regional Water Quality Control Board.

### **3. Hydrostratigraphic Map (12-month process [Appendix B (g)(14)(B)(i)]):**

...Ground water bodies and related geologic structures;

#### **Information required to make AFC conform with regulations:**

Please provide a hydrostratigraphic map that clearly identifies the aquifers in the area of the proposed project. This data, coupled with project earthmoving data, will allow staff to view aquifer locations and note areas for potential groundwater pumping and dewatering.

**Response**—A hydrostratigraphic map of the project area is included at the end of this section. As discussed on page 8.15-3 of the AFC, depth to groundwater under the site is only a few feet. Minimal excavation will be required for construction of the RCEC. The elevation for the plant will be increased

from the current level with fill material to approximately 10 feet; therefore, significant dewatering activities are not expected.

**4. Map of Watercourses and Wetlands (12-month process [Appendix B (g)(14)(B)(ii)]):**

...Surface water bodies;

**Information required to make AFC conform with regulations:**

*Please provide mapping at a legible scale that identifies locations of all natural gas lines, water pipelines, transmission lines (along with tower locations), and laydown/parking areas with respect to all watercourses and wetlands.*

**Response**—The requested map showing the location of project facilities with respect to watercourses and wetlands is provided at the end of this section. Delineated wetlands on the project site are also presented in Figure 8.2-4 of the AFC. No project linears (transmission line, natural gas pipeline, or water pipelines) will cross either watercourses or wetlands. Proposed construction laydown and parking areas do not contain wetlands or watercourses.

**5. Backup Water Source (12-month process [Appendix B (g)(14)(C)(i)]):**

*Source of the water and the rationale for its selection, and if fresh water is to be used for power plant cooling purposes, a discussion of all other potential sources and an explanation why these sources were not feasible.*

**Information required to make AFC conform with regulations:**

*The Applicant has indicated that the project will use effluent supply from the Union Sanitary District (USD) wastewater treatment plant in the event of an interruption with the City of Hayward WPCF. Please provide a discussion similar to the one provided for the City of Hayward WPCF/RCEC and all supporting water quantity and quality data related to the USD water source.*

**Response**—Union Sanitary District discharges an annual average of 31 mgd into the EBDA 60" force main which runs north-south, just to the west of the AWT. As a back-up supply to the Hayward WPCF flow, flow from the EBDA pipeline will be used to feed the AWT. Due to the large amount of flow available in the EBDA pipeline, sufficient quantity will be available for both peak and average RCEC operating conditions. Table 7(s)-1 shows the flows currently available through the EBDA pipeline at the proposed connection point to the AWT, as well as projected flows which will become available after build-out.

Figure 7(s)-1a (attached) is a process flow chart that describes the water treatment system operating with USD/EBDA water supply. We have revised the process flow diagram to clarify that the Title 22 process, including the copper treatment and solids clarification process, will be owned and operated by the City of Hayward. The waste stream from the Title 22 process will be internal to the City of Hayward water recycling program, handled by their existing wastewater treatment plant. The only waste streams from the RCEC to be discharged to the City of Hayward wastewater treatment plant will be the blowdown from the cooling tower, plant drainage, and sanitary wastewater, which will all be discharged to the headworks of the plant.

Water quality information on the USD/EBDA effluent has been updated to include a larger data set, and is shown in Table 7(s)-2.

**Table 7(s)-1. Union Sanitary District flows in the EBDA pipeline at proposed connection point.**

	<b>Units</b>	<b>ADWF</b>	<b>PWWF</b>
<b>Build-out:</b>			
Alvarado	mgd	11.5	38.1
Irvington	mgd	17.9	44.3
Newark	mgd	12.7	34.8
Totals	mgd	<b>42.1</b>	<b>117.2</b>
Totals	cfs	<b>65.1</b>	<b>181.3</b>
<b>1999:</b>			
Alvarado	mgd	8.7	32.8
Irvington	mgd	12.2	30.5
Newark	mgd	10.9	29.7
Totals	mgd	<b>31.8</b>	<b>93.0</b>
Totals	cfs	<b>49.2</b>	<b>143.9</b>

As shown in Table 7(s)-2, the water quality from the EBDA supply contains equivalent or lower concentrations of the parameters of concern than the Hayward WPCF secondary effluent. Similar to the process described in Section 7.3.2, circulating (or cooling) water system blowdown will consist of AWT plant RO product water (generated from the USD/EBDA effluent) concentrated between 50 and 100 cycles, and residues of the chemicals added to the circulating water. Table 7(s)-3 presents the water quality characterization of this wastewater stream, both at 50 and 100 cycles of concentration. The number of cycles the cooling tower will operate at can be varied to ensure the constituent concentrations in the cooling tower blowdown and cooling tower drift are equivalent regardless of the source of the water supply (Hayward WPCF secondary effluent or USD/EBDA secondary effluent).

**Table 7(s)-2. Summary of average water quality characteristics for potential sources of project water.**

Water quality parameter †	Hayward secondary effluent (primary source)	Union Sanitary District/EBDA effluent (secondary source)	Hayward Potable Water Supply	Drinking Water Standard
Turbidity	17 (11-33)	6.5	0.3 (0.2-0.6)	1-5 ntu
Color	—	—	2	15 Pt-Co units
Odor Threshold	—	—	1	3 units
pH	7.8	7.8	8.8	6.0 – 9.0 units
Total Alkalinity	255	300	60	no standard (mg/l)
Bicarbonate	—	—	—	no standard (mg/l)
Total Dissolved Solids	564	830	128	1,500 mg/l
Total Suspended Solids	20	14	—	no standard (mg/l)
BOD	17	9	ND	no standard (mg/l)
TOC	32	13	ND	no standard (mg/l)
Phosphate	4	3	ND	no standard (mg/l)
Total Nitrogen	28	—	ND	no standard (mg/l)
Nitrate as NO <sub>3</sub>	6.0	<0.2	ND	45 mg/l
Fluoride	2.2	1.1	0.1	2 mg/l
Chloride	153	280	12	500 mg/l
Hardness	160	240	63	200 mg/l
Arsenic	0.0017	0.001	ND	0.05 mg/l
Calcium	33	48	11	no standard (mg/l)
Magnesium	14	29	6	no standard (mg/l)
Manganese	0.06	0.07	ND	0.05 mg/l
Sodium	133	200	13	350 mg/l
Potassium	16	12	0.9	no standard (mg/l)
Silica	13	18	6	no standard (mg/l)
Silver	0.002	0.0003	ND	0.1 mg/l
Sulfate	44	85	13	500 mg/l
Cadmium	0.0006	0.0001	ND	0.005 mg/l
Chromium	0.0051	0.0012	ND	0.05 mg/l
Copper*	0.024	0.013	0.058	1.3 mg/l
Cyanide	< 0.003	<0.003	ND	0.2 mg/l
Iron	1.4	0.15	< 0.1	0.30 mg/l
Lead*	0.0022	0.001	0.004	0.015 mg/l
Mercury	0.00005	0.00001	ND	0.002 mg/l
Nickel	0.012	0.012	ND	0.1 mg/l
Boron	0.5	—	ND	no standard (mg/l)
Selenium	0.0012	0.0004	ND	0.05 mg/l
Thallium	—	—	ND	0.002 mg/l
Zinc	0.073	0.036	ND	5.0 mg/l

† units of measure for each analyte are given in the last column

ND = analyte not detected

\* Lead and copper values from City of Hayward tap water. 90<sup>th</sup> percentile value for copper is 0.08 mg/L

**Table 7(s)-3. Circulating water quality with EBDA Supply**

<b>Contaminant</b>	<b>Units</b>	<b>RO Permeate (To Cooling Tower)</b>	<b>Cooling Tower Blowdown at 50 Cycles</b>	<b>Cooling Tower Blowdown at 100 Cycles</b>
Alkalinity-Bicarbonate	mg/L	17.000	232.900	465.800
Alkalinity-Carbonate	mg/L	0.000	5.100	32.700
Alkalinity-P-BaCl2	mg/L	0.000	0.000	0.000
Alkalinity-Phenol	mg/L	0.000	5.100	32.700
Alkalinity-Total	mg/L	17.000	253.000	504.500
Ammonia	mg/L	3.000	150.000	300.000
Arsenic	mg/L	0.000	0.000	0.000
Barium	mg/L	0.000	0.000	0.000
Biochemical Oxygen Demand	mg/L	0.100	< 1.0	< 1.0
Cadmium	mg/L	0.000	0.000	0.000
Chloride	mg/L	8.000	611.410	1223.000
Chromium	mg/L	0.000	0.000	0.000
Copper	mg/L	0.0001	0.005	0.010
Cyanide	mg/L	0.0002	0.010	0.020
Fluoride	mg/L	0.000	0.000	0.000
Hardness-Calcium	mg/L	0.300	15.000	30.000
Hardness-Magnesium	mg/L	0.200	10.000	20.000
Iron	mg/L	0.000	1.000	1.000
Lead	mg/L	0.000	0.000	0.000
Manganese	mg/L	0.000	0.000	0.000
Mercury	mg/L	0.000	0.000	0.000
Nickel	mg/L	0.0001	0.005	0.010
Nitrate as NO <sub>3</sub>	mg/L	0.000	0.000	0.000
pH	s.u.	5.400	7.940	8.360
Phosphate	mg/L	0.000	15.000	15.000
Potassium	mg/L	0.000	0.000	0.000
Selenium	mg/L	0.000	0.000	0.000
Silica	mg/L	0.530	26.500	53.000
Silver	mg/L	0.000	0.000	0.000
Sodium	mg/L	6.000	300.000	600.000
Sulfate	mg/L	1.000	50.000	100.000
Total Dissolved Solids	mg/L	28.000	1510.000	2963.000
Total Organic Carbon	mg/L	1.000	1.000	1.000
Total Suspended Solids	mg/L	0.000	<6.000	<6.000
Temperature	Degrees F	64	100	100
Zinc	mg/L	0.0002	0.010	0.020

The amount of TDS discharged to the atmosphere using the EBDA supply is very low due to the use of cooling towers with the lowest achievable drift (0.0005%). The drift quality is equivalent to the blowdown quality; therefore, the concentration of TDS in the drift is expected to be a maximum of 2,963 mg/L at a flowrate of approximately 0.69 gpm, or equivalent to 25 lb/day.

The waste streams identified in Section 7.3.1 would also result from the AWT operating with the EBDA water supply (i.e. the MF backwash and RO Concentrate). However, as the metals concentrations in the USD/EBDA effluent are equivalent to or lower than Hayward WPCF's effluent, the metals removal processes are expected to achieve lower concentrations prior to discharge than those achievable with the RO Concentrate generated from the Hayward WPCF secondary effluent. Therefore, the concentrations presented in Table 7-3 are assumed to be the worst case scenario of concentrations that will be sent to the EBDA outfall. Water quality characterization of the Hayward effluent with the AWT plant discharges during the use of the EBDA back-up supply are presented in Table 7(s)-4.

**Table 7(s)-4. Predicted Water Quality Characteristics for AWT Wastewater with EBDA Supply**

Constituent	Hayward + AWT		EBDA Discharge Limit*	
	Wastewater Discharge			
PH	7-8	units	6-9	
Total Dissolved Solids	834	mg/l	NA	
Total Suspended Solids	21	mg/l	30 †	mg/l
BOD	18	mg/l	25 †	mg/l
Hardness	169	mg/l	NA	
Calcium (total)	37	mg/l	NA	
Magnesium (total)	14	mg/l	NA	
Manganese	0.1	mg/l	NA	
Sodium (total)	131	mg/l	NA	
Potassium	19	mg/l	NA	
Total Alkalinity	259	mg/l	NA	
Silica	13	mg/l	NA	
Sulfate	105	mg/l	NA	
Chloride	171	mg/l	NA	
Copper (total)	0.022	mg/l	0.023	mg/l
Cadmium	0.0006	mg/l	NA	
Chromium (total)	0.005	mg/l	NA	
Cyanide (total)	0.0038	mg/l	0.021	mg/l
Iron (total)	1.3	mg/l	NA	
Lead (total)	0.0021	mg/l	0.056	mg/l
Mercury (total)	0.00005	mg/l	0.00021	mg/l
Nickel (total)	0.014	mg/l	0.021	mg/l
Nitrate	5.4	mg/l	NA	
Fluoride	2.4	mg/l	NA	
Arsenic	0.002	mg/l	NA	
Selenium (total)	0.0012	mg/l	0.050	mg/l
Silver (total)	0.0017	mg/l	0.023	mg/l
Zinc (total)	0.069	mg/l	0.58	mg/l

\*EBDA discharge limits for settleable matter, benzo(a)anthracene, bis(2-Ethylhexyl) Phthalate, Chrysene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene also exist and will be met in the combined Hayward + AWT discharge.

† Monthly average concentration

**6. Project Wastewater Quality Data (12-month process [Appendix B (g)(14)(C)(ii)]):**

*The physical and chemical characteristics of the source and discharge water;*

**Information required to make AFC conform with regulations:**

*Tables 7.3 and 8.15-4 provide combined water quality characteristics for the Hayward Wastewater and RCEC discharge. Please provide separate water quality characteristics for the project wastewater.*

**Response**—The three main RCEC wastewater streams are the cooling tower blowdown (shown in Table 7-2 and Table 7(s)-3), plant drainage, and sanitary wastewater. As described in section 7.3.4, plant drainage will consist of area washdown, sample drainage, equipment leakage, and drainage from facility equipment areas. Drains that contain oil or grease would be routed through an oil/water separator. The estimated water quality of plant drainage is identical to the RO permeate water presented in Table 7-2, with the exception of an increase in the amount of TDS, from 20 mg/L to approximately 30 mg/L. If the back-up water supply is used, the plant drainage would have identical quality to the characterization presented in Table 7(s)-3, with an increase in TDS from 28 mg/L to approximately 38 mg/L.

As described in section 7.3.3, sanitary wastewater from sinks, toilets, and other sanitary facilities will be collected and discharged to the existing sanitary sewer. Typical water quality characterization of sanitary wastewater is shown in Table 7(s)-5.

**Table 7(s)-5. Predicted Water Quality Characteristics for Sanitary Wastewater**

<b>Constituent</b>	<b>Concentration</b>	<b>Unit</b>
Total Dissolved Solids	500	mg/l
Total Suspended Solids	220	mg/l
BOD	220	mg/l
TOC	160	mg/l
COD	500	mg/l
Total Nitrogen	40	mg/l
Organic N	15	mg/l
Ammonia	25	mg/l
Phosphorus	8	mg/l
Chlorides	50	mg/l
Sulfate	30	mg/l
Alkalinity as CaCO <sub>3</sub>	100	mg/l
Grease	100	mg/l
Total Coliform	10 <sup>7</sup> -10 <sup>8</sup>	no/100 mL
Volatile Organic Compounds	100-400	µg/L

\*McGraw Hill Series in Water Resources and Environmental Engineering, Metcalf and Eddy, 1991, Table 3-16

The treated waste stream quality discharged from the AWT when operating with Hayward secondary effluent, as well as the combined Hayward and AWT effluent is presented in Table 7(s)-6. The quality of the combined effluent is compared to the EBDA discharge permit limits. The treated waste stream quality discharged from the AWT when operating with USD/EBDA water supply is shown in Table 7(s)-7. As can be seen from the tables, operation of the AWT will not cause EBDA to exceed its constituent limits included in the NPDES permit.

**Table 7(s)-6. AWT waste stream quality using Hayward secondary effluent**

**I. Hayward Effluent**

	Hayward Secondary Effluent	AWT RO Concentrate	AWT MF BW	Combined AWT Effluent	Combined Hayward + AWT Effluent	EDBA Limit
Flow (MGD)	8.04	0.67	0.79	1.46	9.50	
PH	8	11.5	7.8	7-8	7-8	6-9
Total Dissolved Solids	564	4138	607	2227	820	
Total Suspended Solids	20	5	66	38	22.8	30,45
BOD	17	87.6	24	53	22.3	25,40
Hardness	160	255	160	204	167	
Calcium	33	101	33	64	37.8	
Magnesium	14	0.72	14	8	13.1	
Manganese	0.06	0.3	0.1	0.2	0.08	
Sodium	133	1	133	72	124	
Potassium	16	101	16	55	22.0	
Total Alkalinity	255	255	255	255	255	
Silica	13	8.34	13	11	12.7	
Sulfate	44	950	44	460	108	
Chloride	153	393	153	263	170	
Cadmium	0.0006	0.004	0.0006	0.0022	0.0008	
Chromium	0.0051	0.0339	0.0051	0.018	0.007	
Copper	0.0235	0.015	0.0235	0.020	0.0229	0.023
Cyanide	0.003	0.019	0.003	0.010	0.0041	0.021
Lead	0.0022	0.005	0.0022	0.003	0.0024	0.056
Mercury	0.00005	0.00025	0.00005	0.0001	0.00006	0.00021
Nickel	0.012	0.0599	0.012	0.034	0.0154	0.021
Nitrate	6.0	0.7	6.0	3.6	5.6	
Fluoride	2.2	14.6	2.2	7.9	3.1	
Arsenic	0.0017	0.0113	0.0017	0.006	0.002	
Boron	0.5	1.1	0.5	0.8	0.5	
Iron	1.4	0.1	8.2	4.5	1.9	
Selenium	0.0012	0.007	0.0012	0.004	0.0016	0.05
Silver	0.0018	0.01	0.0018	0.006	0.0024	0.023
Zinc	0.073	0.0694	0.073	0.071	0.073	0.58

Notes:

- Hayward Effluent Concentrations from Table 8 15-3
- RO concentrate from jar testing when: available, else Table 1 from SPL, April 13
- MF Backwash from SPI Table 1
- Flows are assumed at 90 degrees F
- All units are mg/L

Assumptions:

- TSS in MF BW will be reduced 50% from 132 mg/L to 66 mg/L
- BOD in MF BW will be removed from 36 to 24 mg/L (assume 1/3 particulate BOD)
- Total Alkalinity would be the same for each stream after treatment
- Ideally copper will be removed from the RO concentrate to 15 ug/L total

**Table 7(s)-7. AWT waste stream quality using USD/EBDA secondary effluent**

	Hayward Secondary Effluent	AWT RO Concentrate	AWT MF BW	Combin ed AWT Effluent	Combined Hayward + AWT Effluent	EDBA Limit
Flow (MGD)	13.3	0.67	0.79	1.46	14.77	
pH	8	11.5	7.6	7-8	7-8	6-9
Total Dissolved Solids	564	6132	896	3299	834	
Total Suspended Solids	20	5	47	28	20.7	30,45
BOD	17	47.2	12.8	29	17.9	25,40
Hardness	160	255	240	247	169	
Calcium	33	101	48	72	36.9	
Magnesium	14	0.72	29	16	14.2	
Manganese	0.06	0.3	0.2	0.2	0.1	
Sodium	133	1	200	109	131	
Potassium	16	78	12	42	18.6	
Total Alkalinity	255	300	300	300	259	
Silica	13	8.34	18	14	13.1	
Sulfate	44	1343	85	662	105	
Chloride	153	393	280	332	171	
Cadmium	0.0006	0.0006	0.0001	0.0003	0.0006	
Chromium	0.0051	0.008	0.0012	0.004	0.005	
Copper	0.0235	0.00844	0.0127	0.011	0.0222	0.023
Cyanide	0.003	0.020	0.003	0.011	0.0038	0.021
Lead	0.0022	0.002	0.001	0.002	0.0021	0.056
Mercury	0.00005	0.00007	0.00001	0.00004	0.00005	0.00021
Nickel	0.012	0.062	0.012	0.035	0.0143	0.021
Nitrate	6.0	0.7	0.2	0.4	5.4	
Fluoride	2.2	7.3	1.1	3.9	2.4	
Arsenic	0.0017	0.0068	0.001	0.004	0.002	
Iron	1.4	0.1	0.2	0.2	1.3	
Selenium	0.0012	0.0025	0.0004	0.001	0.0012	0.05
Silver	0.0018	0.0018	0.0003	0.001	0.0017	0.023
Zinc	0.073	0.033	0.036	0.034	0.069	0.58

Notes:

Hayward Effluent Concs from Table 8.15-3

RO concentrate from jar testing for cations/anions, else same removal efficiencies obtained from jar testing assumed from projected concentrations in Table 1 from SPI, June 14

MF Backwash from SPI Table 1

Flows are assumed at 90 degrees F

All units are mg/L

Assumptions:

TSS in MF BW will be reduced 50% from 93 mg/L to 47 mg/L

BOD in MF BW will be removed from 19 to 13 mg/L (assume 1/3 particulate BOD)

Total Alkalinity would be the same for each stream after treatment

**7. Water Pipeline Routes (12-month process [Appendix B (g)(14)(C)(iv)]):**

*A description of all facilities to be used in water conveyance, treatment, and discharge. Include a water mass balance diagram.*

**Information required to make AFC conform with regulations:**

*Energy Commission staff finds Figure 2.3-2 (Water Pipeline Routes) to be confusing. Please provide legible drawings that show clear connection points and routes for the different water lines. Staff recommends the use of a mapping symbols legend to avoid plan congestion.*

*Section 2.2.7.1 identifies RCEC operation requiring 43,730 acre-ft/year. Please provide further clarification regarding this large water demand.*

*Section 2.2.18.4 references Appendix 5-A regarding information on water availability. This Appendix is an evaluation of the Natural Gas Pipeline. Please provide further clarification.*

**Response—**To simplify Figure 2.3-2 the water supply and discharge pipelines have been placed on separate figures. Figures 2.3-2a (Water Supply Pipeline Routes) and 2.3-2b (Water Discharge Pipeline Routes) are included at the end of this section. Additionally, connection points to existing facilities are identified.

There is a typographic error in Section 2.2.7.1 of the AFC. RCEC operation will require 3,730 acre-ft/year.

There is also a typographic error in Section 2.2.18.4 of the AFC; the reference for water availability information should be Appendix 7-A.

**8. Stormwater Hydrologic Evaluation and Drainage Plan (12-month process [Appendix B (g)(14)(D)(ii)]):**

*Drainage facilities and design criteria.*

**Information required to make AFC conform with regulations:**

*Please provide drawings that exhibit all stormwater infrastructures associated with the proposed project (stormwater pipe routes and discharge locations, inlets, oil/water separator locations). Please provide pre vs. post hydrologic calculations and design specifications/calculations for the proposed stormwater management basins.*

*Please refer to Appendix B (h) (2) (Information Required to Make AFC Conform with Regulations).*

**Response—**A drainage plan displaying stormwater infrastructures is included at the end of this section. Detailed hydrologic calculations for the stormwater management basins are also provided.

The basins are sized to maintain the post-development peak discharges at the 15-year, 24-hour pre-development peak flow rate from the entire site (9 cfs). Additional detail is provided in the analysis. On page 8.15-21 of the AFC it is incorrectly stated that the basins will be sized based the 25-year, 24-hour pre-development runoff of 18 cfs.

**9. FEMA Flood Zones (12-month process [Appendix B (g)(14)(iii)]):**

*The effects of the project on the 100-year flood plain or other water inundation zones.*

**Information required to make AFC conform with regulations:**

*The Applicant has indicated that no project related facility is located within the 100-year or 500-year floodplain. Please provide mapping at a legible scale that identifies all natural gas, water pipelines, transmission lines (along with tower locations), and laydown/parking areas with respects to the FEMA Flood Zones.*

*Also, Figure 8.15-3 displays a portion of the RCEC located within the 100-year flood zone. Please provide further clarification. If the project will be within the flood zone, provide a discussion on impacts and proposed mitigation measures.*

**Response—**The requested map of FEMA flood zones including project facilities is included at the end of this section. No project facilities will be constructed within the 100-year flood zone. A portion of the RCEC site is currently at an elevation below the 100-year flood elevation as shown on the FEMA maps; however, the property is currently protected from 100-year flood events by berms at the southern end of the property. Additionally, ground level at the RCEC will be increased approximately 5 feet with fill material before construction. Therefore, the RCEC will be protected from 100-year flood events.

**10. USD Backup Water Supply LORS (6-month and 12-month processes [Appendix B (h)(1)(A), §2022(b)(1)(A)]):**

*Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, and permits applicable to the proposed project, and a discussion of the applicability of each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed;*

**Information required to make AFC conform with regulations:**

*Please provide LORS information pertaining to the proposed backup water supply from the Union Sanitary District (USD) wastewater treatment plant.*

*Provide a “will serve” letter from USD that accepts the Applicants proposal to use their water as backup supply.*

*The “will serve” letter from the City of Hayward (Appendix 7A) does not indicate whether the City will accept sanitary wastewater. Please provide clarification regarding the aforementioned issue.*

**Response—**The attached letter from Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward, to the Regional Water Quality Control Board explains that the backup water supply from the Union Sanitary District belongs to EBDA once it enters the EBDA outfall pipeline downstream of the Union Sanitary District’s Alvarado Treatment Plant. The backup water supply would be provided by the City of Hayward, through their agreement with EBDA. The LORS that apply to the backup supply are thus the same as those that apply to the primary supply. The City of Hayward’s “will serve” letter thus covers both the primary and backup supplies.

Attached is a copy of an e-mail communication from Mr. Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward indicating that the City is willing to accept the RCEC's sanitary effluent.

***11. Alameda County Hydrology Manual (12-month process [Appendix B (h)(2)]):***

*A discussion of the conformity of the project with the requirements listed in subsection (h)(1)(A).*

***Information required to make AFC conform with regulations:***

*The Applicant has indicated drainage conformance related to the Alameda County Hydrology Manual referenced as A.3.3.4. Energy Commission staff was unable to locate the aforementioned reference and supporting information. Please provide the appropriate reference and supporting information related to drainage conformance.*

**Response**—The correct reference for this document is the *Hydrology and Hydraulics Criteria Summary for Western Alameda County, Revised August 7, 1989*. This document is available from the Alameda County Public Works Agency. The document is intended to define current district practices in the hydrologic and hydraulic design of flood control facilities in western Alameda County. Hydrologic and hydraulic design of the RCEC stormwater conveyance systems will be in accordance with these guidelines. Because of the size and format of this document, it is not practical to include it with this supplement. One copy will be provided directly to CEC staff technical reviewer.

**LETTER FROM CITY OF HAYWARD TO  
REGIONAL WATER QUALITY CONTROL BOARD**

JUN 15 '01 04:52 CITY OF HAYWARD - PW

P.2



CITY OF  
**HAYWARD**  
HEART OF THE BAY

June 15, 2001

Ms. Shin Roel Lee  
Division Chief, NPDES Division  
California Regional Water Quality Control Board  
San Francisco Bay Region  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

**Subject: Permitting Considerations Regarding Russell City Energy Center (RCEC)  
and Advanced Water Treatment Facility**

Dear Ms. Lee:

Recently, some issues have arisen regarding the above-referenced. In order for the City of Hayward and Calpine/Bechtel to move forward as expeditiously as possible with State Energy Commission certification of this energy project which is so critical to California's energy needs and Governor Davis' stated priorities, I would like to request your assistance in better understanding the issues involved with NPDES and/or other permitting elements which need to be addressed. Hopefully, the City and Calpine/Bechtel can work through these issues with you and the RWQCB as quickly as possible in order to keep this project moving forward and on schedule.

As you may be aware from information provided in Calpine/Bechtel's Application for Certification (AFC), the RCEC project will generate several wastewater streams. The first group of wastewater streams, which will be discharged to the City of Hayward sanitary sewer system and WPCF influent, are those which will be generated by the power plant, itself. These include cooling tower blow down, and, of course, sanitary discharges generated within the power plant facility. All of these will be regulated under an Industrial Wastewater Discharge Permit issued through the City's approved Industrial Pretreatment Program. The standards to be applied to these discharges will be those contained in the City of Hayward Wastewater Discharge Regulations and, as applicable, those provided in the USEPA Categorical Pretreatment Standards for the NSPS Steam Electric Generating Category.

Stormwater discharges from the power plant will be regulated under State of California General Industrial and General Construction Stormwater NPDES Permits. A description of the Stormwater Management and Monitoring Plans proposed for the power plant and in compliance with these permits is contained in the AFC and is being further developed as part of facility design.

JUN 15 '01 04:53PM CITY OF HAYWARD - PW

P.3

Of the wastewater streams generated within the power plant and discharged to the sanitary sewer system, only the cooling tower blow down stream will fall under the federal categorical standards. These flows are, in aggregate, quite small and the City's Industrial Pretreatment Program staff has evaluated the discharges to be permitted under the City's authority and have found them to be compliant with all standards. We intend to begin the permitting process within 6 months, or so, of start-up of facility operation. This is consistent with the time schedule used for most other new industrial dischargers and, due to the pre-evaluation and approval process which this discharge has already undergone, we foresee no problems, whatsoever, with satisfactory completion of the process prior to the start-up of the RCEC. It is important to note that NO process wastewater from the power plant portion of the RCEC, owned and operated by Calpine/Bechtel, will be discharged directly to waters of the State of California

The other group of wastestreams which will be generated as a result of the RCEC project are those associated with the Advanced Water Treatment Facility. This facility will produce virtually all of the water required for the RCEC power plant and will use, as its primary raw water feedstock, the secondary effluent produced by the City of Hayward Water Pollution Control Plant. The AWT will be constructed and operated at the expense of Calpine/Bechtel, but will be transferred to, owned and operated by the City of Hayward. It will be operated as an integral part of the City's Water Pollution Control Plant and the effluent from the AWT portion of the plant will be treated to the same, or higher, standards as the remaining secondary effluent. In essence, there will be two secondary effluent quality wastewater streams discharging to the same effluent channel and, from there, through chlorination and into the EBDA system. However, as a result of evaporative losses by the RCEC power plant, the overall volume of wastewater discharged from the City of Hayward Water Pollution Control Plant will be significantly reduced.

Based upon several previous discussions with RWQCB staff and our understanding of RWQCB's NPDES permitting requirements and policy, we did not consider that any new or separate NPDES permit or Waste Discharge Requirements would be necessary for either the RCEC power plant or the AWT. As described, all of the power plant wastewater will be discharged to the City of Hayward Sanitary Sewer System under permit by and regulation of our approved Industrial Pretreatment Program. The AWT, and all discharges therefrom, will be part of our existing City of Hayward Water Pollution Control Plant. Of course, we understand that our existing NPDES permit for the plant discharge, which is held by EBDA of which the City of Hayward is a member agency and co-permittee, may require modification and/or amendment in order to incorporate the new process description and new unit process elements into the facility description for the City of Hayward plant. It would seem that any such permit modifications and/or amendments would be most appropriately dealt with as the project is further developed and closer to becoming operational. In any event, and as described in the AFC, the RCEC will not generate any significant new loadings for the City of Hayward Water Pollution Control Plant. In addition, the new AWT component of the City's plant will generate a discharge component which will be equal to or better than secondary effluent standards, a reduced loading of several heavy metals and other

JUN 15 '01 04:53P CITY OF HAYWARD - PW

P.4

constituents will occur as a result of AWT MF backwash/RO concentrate treatment, and overall City of Hayward discharge volumes to EBDA and San Francisco Bay will be substantially reduced. Consequently, the overall project will generate a substantial water quality benefit over the condition that would exist absent the construction of the RCEC.

Beyond the substantial water quality benefits, this project represents a real and viable water reclamation/reuse project which goes well beyond the normal irrigation-use-only projects which, themselves, are few-and-far-between. The AWT will produce, using as its feedstock secondary wastewater effluent otherwise discharged to San Francisco Bay, extremely high quality water suitable for virtually any use. Since the AWT will have capacity excess to the needs of the power plant during the vast majority of power plant operational periods, there will be surplus water available for distribution to other industrial customers. It is the intent of both Calpine/Bechtel and the City of Hayward to develop other users of this excess capacity. The benefits to other industrial customers include extremely high quality water AND an assured supply irrespective of even serious drought conditions which may occur in the future. Quite frankly, the high quality AWT water project will be one of the first projects of its type that we are aware of in northern California and, due to the great benefit to the public interest, the City and Calpine/Bechtel would like to see it brought on-line as soon as possible.

In order to assist you in understanding the wastewater streams generated by the RCEC, including the power plant and the AWT, a process flow diagram is attached for your convenience.

I would greatly appreciate an opportunity to discuss with you and/or any other members of the RWQCB staff the permitting issues associated with this project from the perspective of the RWQCB. Hopefully, we can work through these issues and/or clear up any confusion or misconceptions that may exist. It is certainly the intention of the City and of Calpine to address all issues of concern to the RWQCB and Board staff. However, in consideration of the importance of the expeditious development of this project, I would appreciate hearing from you as soon as possible. I can be reached at (510) 583-4720, or by e-mail at [alex@ci.hayward.ca.us](mailto:alex@ci.hayward.ca.us).

Sincerely,



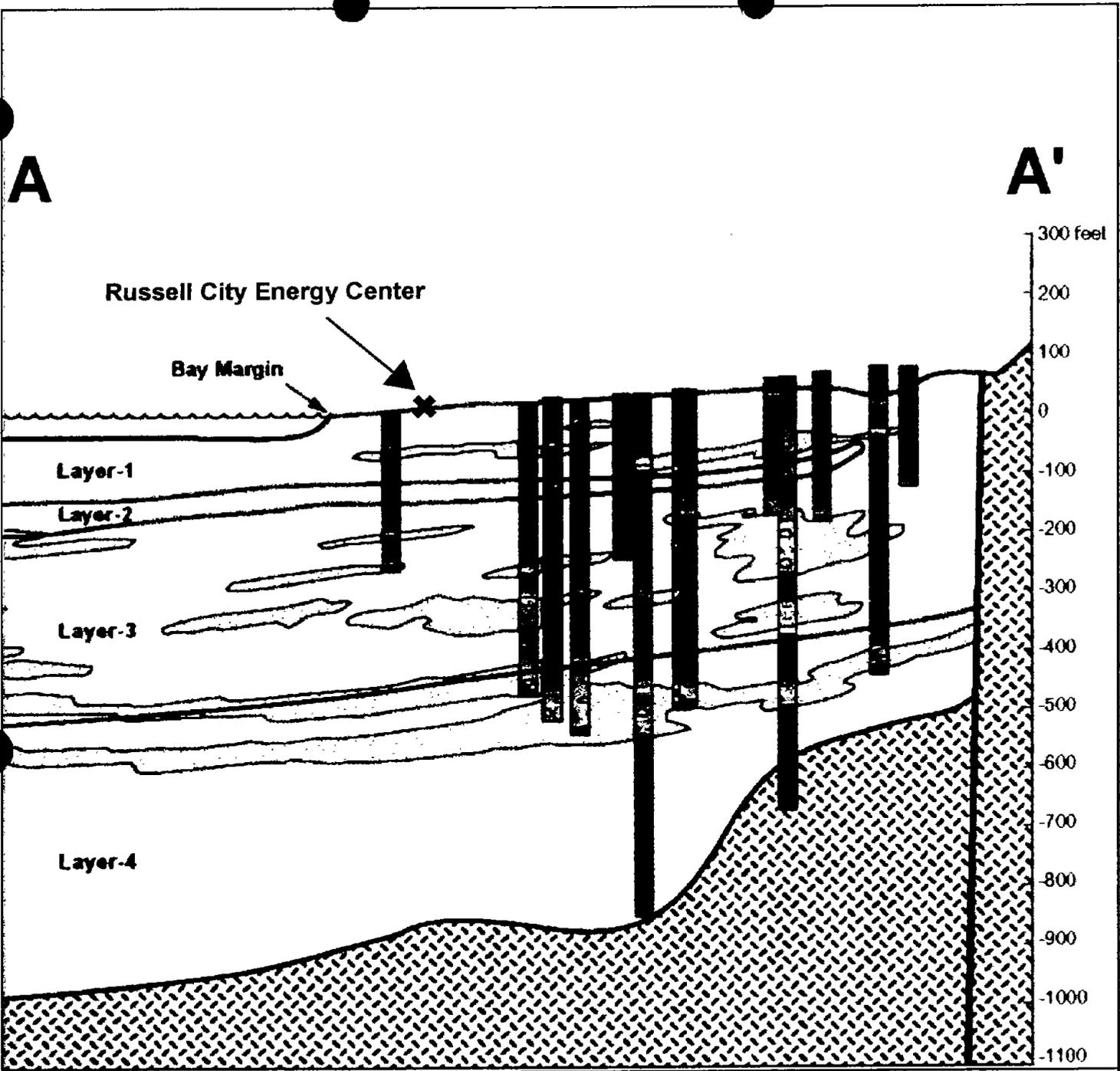
Alex Ameri, P.E.  
Deputy Director of Public Works/Utilities

Attachment: RCEC Process Flow Schematic

cc: Lila Tang  
Judy Chen



## **HYDROSTRATIGRAPHIC MAP OF PROJECT AREA**



- Bedrock
- Clay
- Fill
- Gravels
- Silts
- Sands
- Unknown
- Aquifer Unit Correlation

Figure 8.15(s) -1

Hydrologic Cross Section  
RUSSELL CITY ENERGY CENTER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

## **MAP OF WETLANDS AND WATERCOURSES**



Water supply pipeline

Gas pipeline

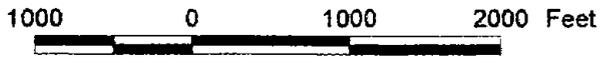
Transmission line

Russell City Energy Center

Eastshore substation

**Legend**

-  Wetlands
-  Construction laydown and parking areas
-  Engineered drainage channel
-  Transmission towers



Scale = 1:12,000

Figure 8.15(s)-2

Wetlands/watercourses  
near project facilities

**RUSSELL CITY ENERGY CENTER**



FOSTER WHEELER ENVIRONMENTAL CORPORATION

## **PROCESS FLOW DIAGRAM**

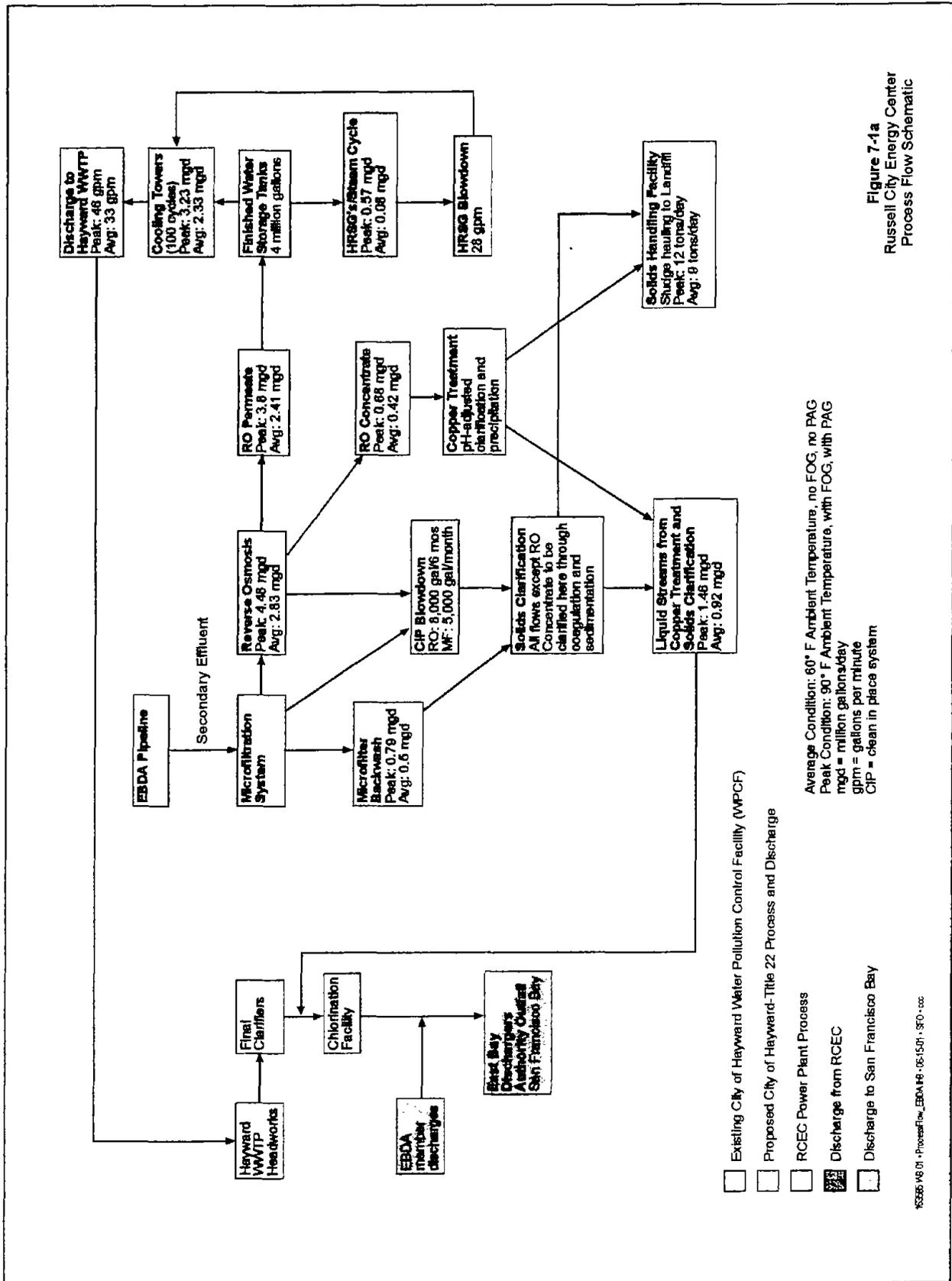


Figure 7-1a  
Russell City Energy Center  
Process Flow Schematic

- Existing City of Hayward Water Pollution Control Facility (WPCF)
- Proposed City of Hayward-Title 22 Process and Discharge
- RCEC Power Plant Process
- Discharge from RCEC
- Discharge to San Francisco Bay

Average Condition: 60° F Ambient Temperature, no FOG, no PAG  
 Peak Condition: 90° F Ambient Temperature, with FOG, with PAG  
 mgd = million gallons/day  
 gpm = gallons per minute  
 CIP = clean in place system

16365 M8 01 - Process Flow, EBDA-M8 - 06-15-01 - 3FD - 000

## **WATER PIPELINE ROUTES**

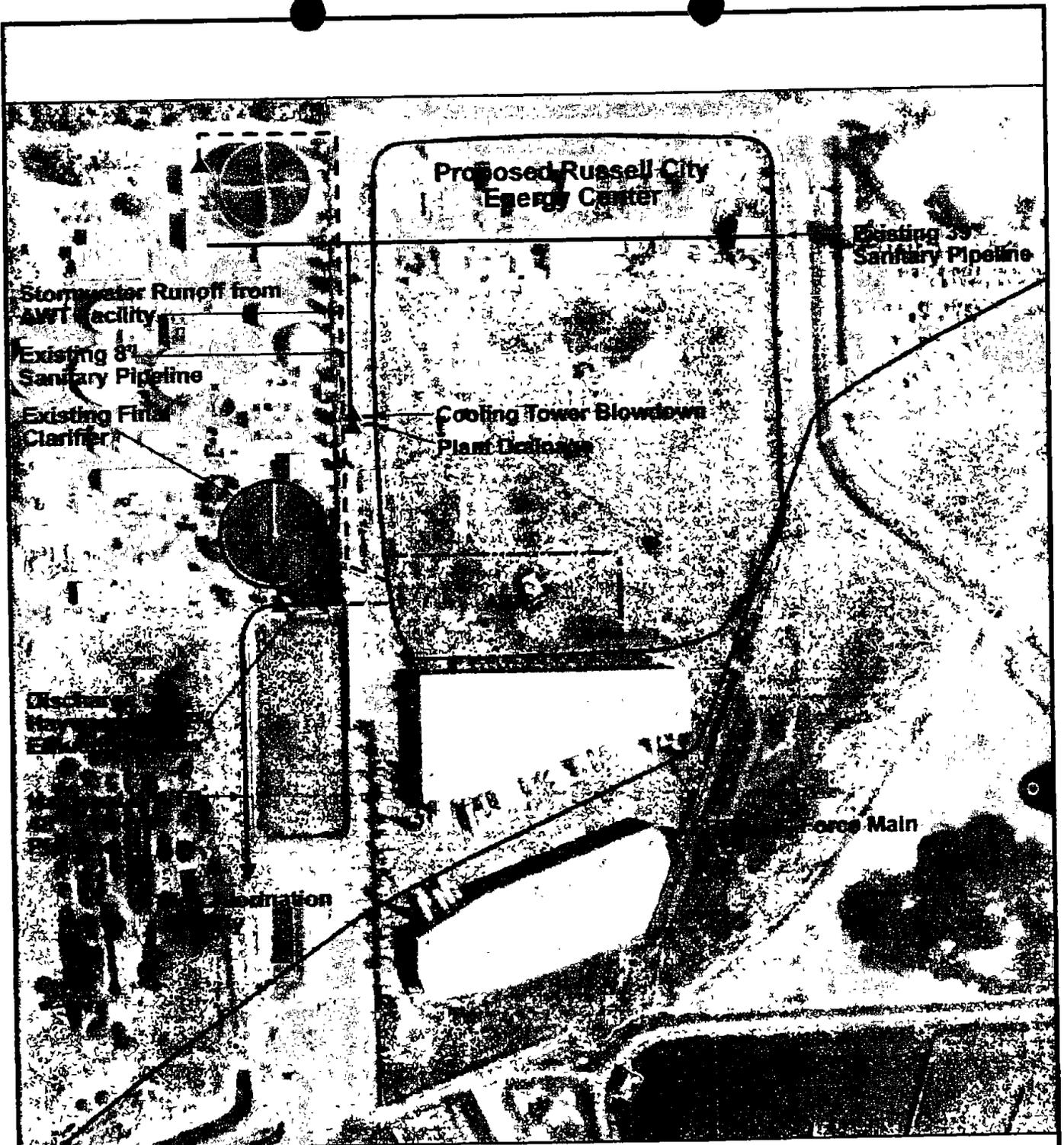


- Proposed Pipeline
- Existing Pipeline
- ▲ Connection Point to Existing Facilities

  
 Not to Scale

Figure 8.15(s)-3a  
 Water Supply Pipeline Routes  
 RUSSELL CITY ENERGY CENTER  
  
 FOSTER WHEELER ENVIRONMENTAL CORPORATION

Source: CH2M Hill



- Proposed Pipeline
- Existing Pipeline
- ▲ Connection Point to Existing Facilities



Not to Scale

Figure 8.15(s)-3b  
 Water Discharge Pipeline Routes  
**RUSSELL CITY ENERGY CENTER**



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Source: CH2M Hill

# RCEC DRAINAGE PLAN



**PRE- AND POST DEVELOPMENT HYDROLOGIC ANALYSIS**

**RUSSELL CITY ENERGY CENTER  
PRELIMINARY STORM WATER  
MANAGEMENT BASIN SIZING, PRE- &  
POST-DEVELOPMENT RUNOFF ANALYSIS**

**Calculation No. H&H-1**

**Job No. 24405**



**BECHTEL CORPORATION  
GEOTECHNICAL & HYDRAULIC ENGINEERING SERVICES  
FREDERICK, MARYLAND**

**June 2001**

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Use of these calculations by persons, without access to pertinent factors and without proper regard for their purpose, could lead to erroneous conclusions.

Should it become necessary to use any of these calculations in future work, it is suggested that the calculations be reviewed with authorized Bechtel personnel to ensure that the purposes, assumptions, judgements, and limitations are thoroughly understood. Bechtel cannot assume responsibility for the use of these calculations not under our direct control.



# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Crain J. Talbot

DATE June 11 2001

SHEET NO 2

CHECKER SWT

DATE 6/14/01

SHEET REV 0

## I. Objective

To size the storm water management basin for the Russell Energy Center Project located Hayward, CA. The basin will collect the runoff from the power plant portion of the Russell City Energy Facility site. A portion of the site will be dedicated to a Title 22 water treatment facility. Runoff from this portion of the site will not drain to the proposed basin. The basin will be sized to control peak discharges from storms up to and including the 25-year, 24-hour storm, per the project scope book. The basin will discharge to an existing Alameda County drainage canal south of the site. This canal was designed for the 15-year peak flow from the existing site. Therefore, the basin is sized to maintain the post-development peak discharges at the 15-year, 24-hour pre-development peak flow rate from the entire site. Alameda County drawings for the canal indicate that this discharge was estimated to be about 9.0 cfs. NRCS (formerly SCS) methodologies and the NRCS computer program TR-20 are used to determine the pre- and post-development peak discharges as well as perform the flood routing through the storm water management basin.

## II. Rainfall Data

The 24-hour rainfall depths for site are determined from the Application for Certification (Attachment1) and are tabulated below for the design frequencies:

2-Year	1.98 inches
10-Year	3.34 inches
25-Year	4.01 inches
50-Year	4.50 inches
100-Year	4.98 inches

The 15-Year, 24-hour rainfall depth is determined by plotting the 24-hour values above on extreme probability paper. This plot is shown on sheet 3. From this plot, the 15-year, 24-hour value is estimated to be about 3.63 inches.

An SCS Type I rainfall distribution is used to simulate the 24-hour events.

## III. Soils Information

Based on field observation of slow draining soils, for this analysis hydrologic soil group C, which is typical of floodplain areas, is assumed to represent the site soil conditions.



# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Craig J. Talbot

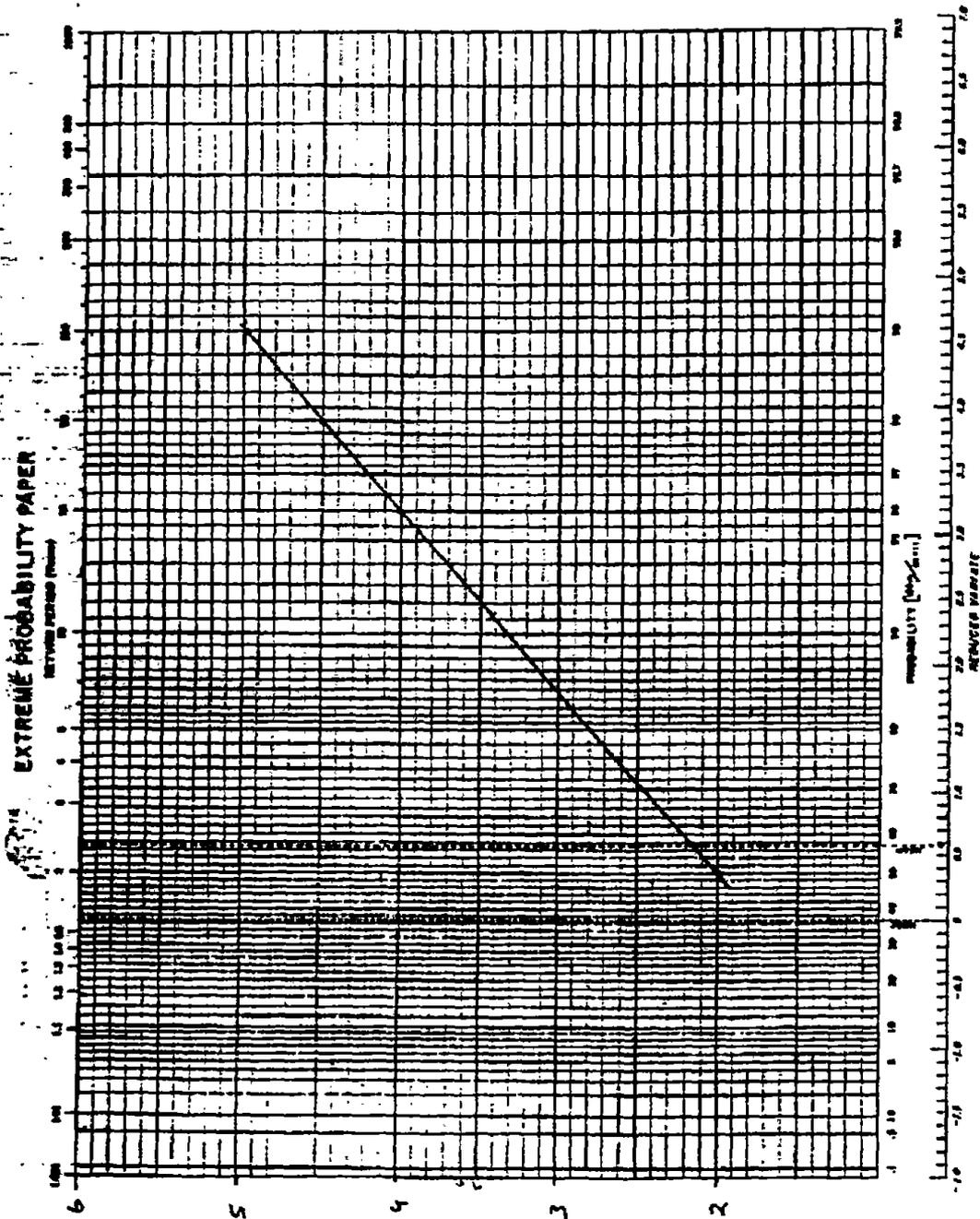
DATE June 11 2001

SHEET NO 3

CHECKER SWT

DATE 6/14/01

SHEET REV 0





# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Craig J. Talbot

DATE June 11 2001

SHEET NO 4

CHECKER SWT

DATE 6/15/01

SHEET REV 0

## IV. Pre-Development Runoff Analysis

The pre-development peak discharges for the various storm frequencies is determined based in the following hydrologic parameters:

### IV.1 Drainage Area:

The pre-development drainage area for the proposed development is equal to about 15.5 acres and is shown on sheet 5.

### IV.2 Time of Concentration

The pre-development time of concentration flow path is also shown on sheet 5 and is calculated below using NRCS methodologies:

Segment A-B, Sheet Flow (Reference 1)

$$T_i = \frac{0.007(nl)^{0.8}}{P^{0.5}S^{0.4}}$$

Where:

n = Surface roughness, (0.24, Ref. 1, dense grass )

l = Length, (150 ft)

P = 2-yr, 24-hr depth (1.98 in.)

S = Slope, ( $\frac{10 - 7.8}{150} = 0.015$ )

$$T_i = \frac{0.007(0.24 * 150)^{0.8}}{1.98^{0.5}0.015^{0.4}} = 0.47 \text{ hour}$$

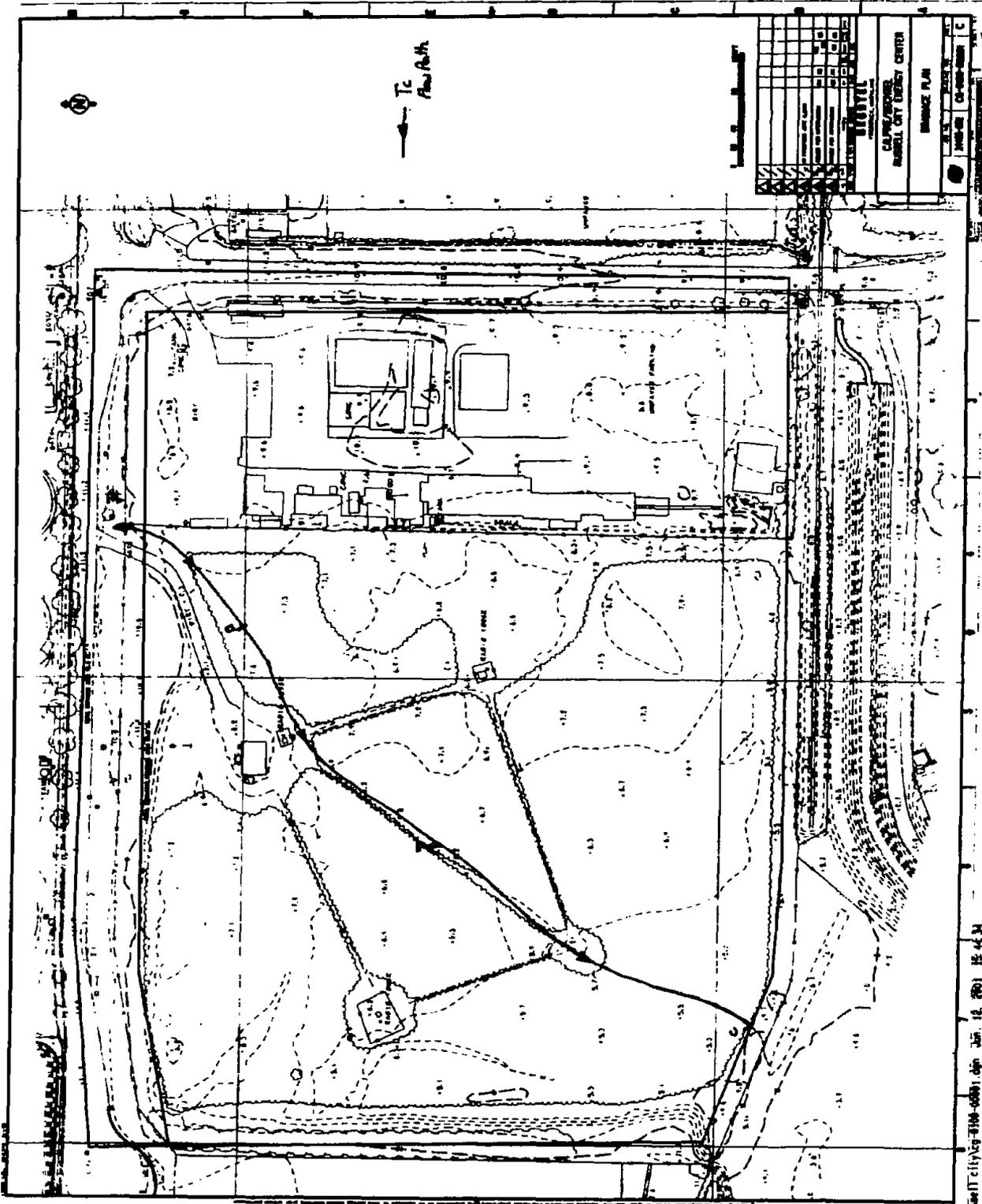
Segment B-C, Shallow Concentrated Flow, (Reference 2)

$$T_i = \frac{L}{3600V} \quad L = 785 \text{ ft. For } S = \frac{7.8 - 4.7}{785} = 0.004, \quad V = 1.02 \text{ fps (Ref. 2, Figure 3-1)}$$

$$T_i = \frac{780}{3600 * 1.02} = 0.21 \text{ hour}$$

$$T_c = \sum T_i = 0.47 + 0.21 = 0.68 \text{ hour}$$

Job No. 24405  
 Calculated H2O-1  
 Rev. 0.  
 Sheet 5  
 Orig. CIV  
 12 June 2001  
 Chkd. SWP, 07/01



... (Vertical text on the right edge of the drawing)



# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Crain J. Talbot

DATE June 11 2001

SHEET NO 6

CHECKER SWT

DATE 6/14/01

SHEET REV 0

### IV.3 Runoff Curve Number

Approximately 4.8 acres of the eastern portion of the site is presently used for industrial purposes and is almost completely paved. The remaining site ground cover consists mainly of grasses and shrub. A runoff curve number of 74 (pasture grassland) is selected for the undeveloped portion and a curve number of 91(industrial) for the developed portion. The composite pre-development curve number is calculated below:

Land Cover	Area, (ac)	CN (Ref 3)	Area X CN
Pature	10.70	74	791.8
Impervious	4.80	91	436.8
Total	15.50		1228.6

$$\text{Composite CN} = \text{Total Area X CN} / \text{Total Area} = 79.26$$

$$\text{Use CN} = 80$$

Based on NRCS methodologies using a curve number of 80, a 15-year, 24-hour precipitation depth of 3.63 inches, the runoff depth will be 1.74 inches. This is equivalent to a runoff coefficient of about 0.48.

### IV.4 Peak Discharges

The pre-development peak discharges are determined using the NRCS computer program TR-20. Attachment 2 contains the pre-development output file from TR-20. The results are summarized below:

Return Period	Peak Discharge (cfs)
2-Yr	2.14
10-Yr	7.45
15-Yr	8.74
25-Yr	10.50
50-Yr	12.83
100-Yr	15.23



# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Craig J. Talbot

DATE June 11 2001

SHEET NO 7

CHECKER SWT

DATE 6/15/01

SHEET REV 0

## V. Post-Development Runoff Analysis

### V.1 Drainage Area

The post-development drainage area is 11.8 acres and is shown on sheet 8. The drainage area does not include the Title 22 Water Treatment Facility (3.0 acres) or the cooling tower basin (0.70 acre). The runoff from the Title 22 facility will be handled by a separate storm water collection system. Precipitation over the cooling tower area will be collected in the cooling tower basin and thus there will be no runoff from this area.

### V.2 Time of Concentration

The post-development time of concentration flow path is shown on sheet 6. The time of concentration is calculated below:

Segment A-B, Sheet Flow

$$T_i = \frac{0.007(nl)^{0.8}}{P^{0.5}S^{0.4}}$$

Where:

n = Surface roughness, (0.05 Loose Gravel Ref. 1)

l = Length, (150 ft)

P = 2-yr, 24-hr depth (1.98 in.)

S = Slope, (0.005)

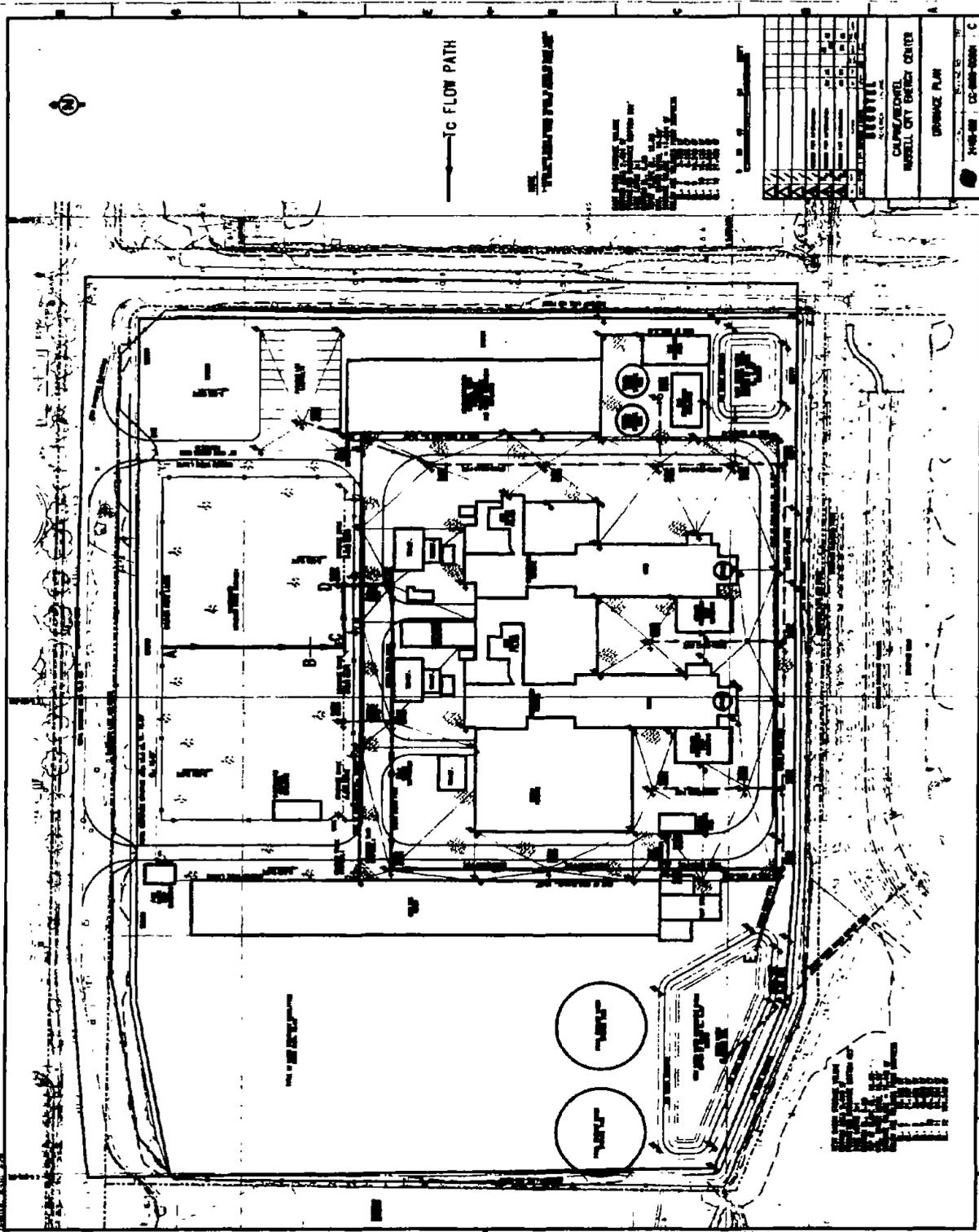
$$T_i = \frac{0.007(0.05 * 150)^{0.8}}{1.98^{0.5} 0.005^{0.4}} = 0.208 \text{ hour}$$

Segment B-C, Shallow Concentrated Flow

$$T_i = \frac{L}{3600V} \quad L = 52 \text{ ft. For } S = 0.005, \quad V = 1.14 \text{ fps}$$

$$T_i = \frac{52}{3600 * 1.14} = 0.012 \text{ hour}$$

Job No. 24405  
Calculation HEM-1  
Rev. 0.  
Sheet B  
Orig: CST  
R. Jones Inc.  
Chief: SUT, 6/14/05



vrassal c:\atg-0106-00001 egn Jun 18, 2001 10:55:16



# CALCULATION SHEET

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

BY Craig J. Talbot

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Segment C-D, Swale Flow, estimate V = 3.0 fps, L = 74 ft

$$T_i = \frac{74}{3600 * 3.0} = 0.007 \text{ hour}$$

Segment D-E, Pipe Flow, estimate V = 4.0 fps, L = 850 feet

$$T_i = \frac{850}{3600 * 4.0} = 0.059 \text{ hour}$$

$$T_c = \sum T_i = 0.208 + 0.012 + 0.007 + 0.059 = 0.286 \text{ hour}$$

### V.3 Runoff Curve Number

The post-development composite runoff curve number is calculated below based on hydrologic soil classification C.

Land Cover	Area, (ac)	CN (Ref 3)	Area X CN
Pond	0.70	100	70
Impervious	7.77	98	761.46
Grass	0.90	74	66.6
Gravel	2.43	85	206.6
Total	11.80		1104.6

$$\text{Composite CN} = \text{Total Area X CN} / \text{Total Area} = 93.61$$

$$\text{Use CN} = 94$$

Note: Pond = 0.50 ac + 0.20 ac

Impervious = 5.0 ac + 0.1 ac + 0.05 ac + 0.45 ac + 0.17 ac + (15.5 ac - 13.5 ac)

Grass = 0.90 ac

Gravel = 11.80 ac - 0.7 ac - 7.77 ac - 0.90 ac



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SHEET REV 0

## V.4 SWM Basin Stage-Storage

There are two storm water management basins, one located in the southwest corner of the site and the other in the southeast corner. The basins are interconnected by the plant storm drain piping system and thus will act together as a single storage facility. The basins will be treated as a single storage basin for the purposes of this calculation. The combined basin storage volume versus water level relationship is developed from information provided on sheet 8 and is summarized below:

### Combined SWM Basin Stage vs Storage Data

Basin Invert = 5.0 ft

Top of Basin 12.0 ft

Basin Side Slopes: 3 horizontal to 1 vertical

Elevation (ft)	Total Volume (ft <sup>3</sup> )	Total Volume (ac-ft)
5.00	0.00	0.00
6.00	10125.00	0.23
7.00	27913.00	0.64
8.00	41127.00	0.94
9.00	60070.00	1.38
10.00	81455.00	1.87
11.00	105395.00	2.42
12.00	131976.00	3.03



# CALCULATION SHEET

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SHEET NO 11

CHECKER SWT

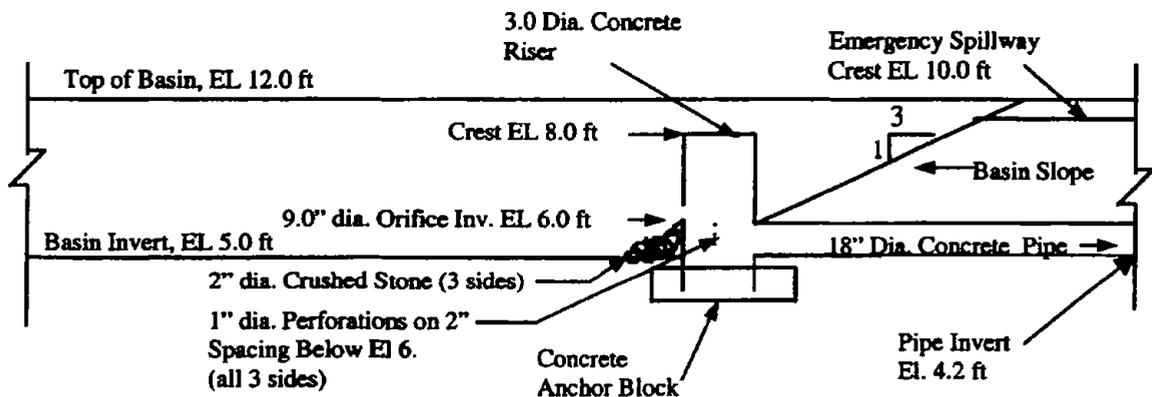
DATE 6/14/01

SHEET REV 0

## V.5 SWM Basin Stage-Discharge

The water level versus discharge flow rate is determined based on the configuration of the principal and emergency spillways for the basin. The basin outlets to the existing drainage canal along the south side of the site. Two tail water scenarios will be analyzed. For case 1, the tailwater elevation in the canal will be the design high water level which is estimated to be 7.4 ft (Ref 3.) The starting water level in the basin shall be elevation 6.0 at the beginning of the storm to account for sediment deposition. Due to the high tail water level, no discharge will occur from the basin until the water level reaches at least elevation 7.4 ft. The outlet will be equipped with a tide valve to prevent backflow into the basin. For Case 2, the tailwater elevation will be equal to the top of the outlet pipe at elevation 5.7 ft. to simulate a low flow condition in the canal. For Case 2, the starting water level in the basin will also be elevation 6.0 ft.

### SWM Basin



In addition to the outlet structure shown above, there is also a 10 foot lined emergency spillway with a crest invert elevation of 10.0ft. The discharge versus elevation equations for each component of the structure are shown below:



# CALCULATION SHEET

PROJECT Russell City Energy Center

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SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

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SHEET NO 12

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DATE 6/14/01

SHEET REV 0

Orifice Equation: (9.0" diameter orifice center line outlet at EL 6.375 ft.(for Case 1 El. 7.4 ft))

$$Q = CdA\sqrt{2gh}$$

Where:

$$Cd = 0.6$$

$$A = \frac{0.75^2\pi}{4} = 0.442 \text{ ft}^2$$

$$h = \text{W.L. EL.} - 6.375^* \text{ ft}$$

$$Q = 2.127 h^{1/2} \text{ cfs}$$

\*Note: for Case 1 the value is 7.4 ft

Riser Weir Equation: (Weir crest at EL 8.0 ft.)

$$Q = CLH^{3/2}$$

Where:

$$C = 2.8$$

$$L = 9.42, \text{ ft.}$$

$$H = \text{W. L. EL.} - 8.0 \text{ ft}$$

$$Q = 26.39H^{3/2} \text{ cfs}$$

Pipe Flow Equation:

The equation for pipe flow conditions is as follows:

$$h = \left( K_e + K_{ex} + \frac{29n^2L}{R^{4/3}} \right) \frac{Q_p^2/A^2}{2g}$$

Where:  $n = 0.013$  (concrete pipe)

$$h = \left( 0.0233 + \frac{0.45n^2L}{R^{4/3}} \right) Q^2/A^2$$

$$A = \frac{1.5^2\pi}{4} = 1.767 \text{ ft}^2$$

$$R = 1.5/4 = 0.375 \text{ ft}$$

$$L = 260.0 \text{ ft}$$

$$h = 0.0309Q^2$$

$$K_e = 0.5 \text{ (entrance loss)}$$

$$Q = 5.69h^{1/2}$$

$$K_{ex} = 1.0 \text{ (exit loss)}$$

$$h = \text{W. L. El} - \text{TW ft.}$$



# CALCULATION SHEET

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SHEET REV 0

**Emergency Spillway Flow: (Crest EL 10.0 ft.)**

$$Q = CLH^{3/2}$$

Where:

$$C = 2.8$$

$$L = 10.0 \text{ ft}$$

$$H = \text{W. L. EL} - 10.0 \text{ ft}$$

$$Q = 28.0H^{3/2} \text{ cfs}$$

The combined stage-discharge flow is summarized for each case below:

**SWM Basin  
Case 1 Stage Discharge Summary (TW = 7.4 ft.)**

Elevation (ft)	Orifice Flow		Riser Weir Flow		Total Riser Flow (cfs)	Pipe Flow		Spillway Flow		Total Basin Flow* (cfs)
	h (ft)	Q (cfs)	H (ft)	Q (cfs)		h (ft)	Q (cfs)	H (ft)	Q (cfs)	
6.00					<b>0.00</b>					0.00
6.50	0.00	0.00			<b>0.00</b>					0.00
6.75	0.00	0.00			<b>0.00</b>					0.00
7.00	0.00	0.00			<b>0.00</b>					0.00
7.50	0.10	0.67			<b>0.67</b>	0.10	1.80			0.67
8.00	0.60	1.65	0.00	0.00	<b>1.65</b>	0.60	4.41			1.65
8.25	0.85	1.96	0.25	3.30	<b>5.26</b>	0.85	5.25			5.25
8.50			0.50	9.33	<b>9.33</b>	1.10	5.97			5.97
9.00			1.00	26.39	<b>26.39</b>	1.60	7.20			7.20
10.00			2.00	74.64	<b>74.64</b>	2.60	9.17	0.00	0.00	9.17
10.25			2.25	89.07	<b>89.07</b>	2.85	9.61	0.25	3.50	13.11
10.50			2.50	104.32	<b>104.32</b>	3.10	10.02	0.50	9.90	19.92
11.00			3.00	137.13	<b>137.13</b>	3.60	<del>10.80</del>	1.00	28.00	38.80
12.00			4.00	211.12	<b>211.12</b>	4.60	<del>12.28</del>	2.00	79.20	91.40

\* Note: Total Basin Flow is determined by adding either the Total Riser Flow or Pipe Flow, whichever is controlling (bold type face indicates controlling flow), to the spillway flow

Total Riser Flow = Orifice + Weir Flow

Orifice flow is considered negligible once the orifice is submerged



# CALCULATION SHEET

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## SWM Basin Case 2 Stage Discharge Summary (TW = 5.7 ft.)

Elevation (ft)	Orifice Flow		Riser Weir Flow		Total Riser Flow (cfs)	Pipe Flow		Spillway Flow		Total Basin Flow* (cfs)
	h (ft)	Q (cfs)	H (ft)	Q (cfs)		h (ft)	Q (cfs)	H (ft)	Q (cfs)	
6.00					<b>0.00</b>					0.00
6.50	0.13	0.75			<b>0.75</b>					0.75
6.75	0.38	1.30			<b>1.30</b>					1.30
7.00	0.63	1.68			<b>1.68</b>					1.68
7.50	1.13	2.26			<b>2.26</b>	1.80	7.63			2.26
8.00	1.63	2.71	0.00	0.00	<b>2.71</b>	2.30	8.63			2.71
8.25	1.88	2.91	0.25	3.30	<b>6.21</b>	2.55	9.09			6.21
8.50			0.50	9.33	<b>9.33</b>	2.80	9.52			9.52
9.00			1.00	26.39	<b>26.39</b>	3.30	10.34			10.34
10.00			2.00	74.64	<b>74.64</b>	4.30	11.80	0.00	0.00	11.80
10.25			2.25	89.07	<b>89.07</b>	4.55	12.14	0.25	3.50	15.64
10.50			2.50	104.32	<b>104.32</b>	4.80	12.47	0.50	9.90	22.37
11.00			3.00	137.13	<b>137.13</b>	5.30	13.10	1.00	28.00	41.10
12.00			4.00	211.12	<b>211.12</b>	6.30	14.28	2.00	79.20	93.48

\* Note: Total Basin Flow is determined by adding either the Total Riser Flow or Pipe Flow, which ever is controlling (bold type face indicates controlling flow), to the spillway flow

Total Riser Flow = Orifice + Weir Flow

Orifice flow is considered negligible once the orifice is submerged



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CHECKER SMT

DATE 6/14/01

SHEET REV 0

## V.6 Peak Discharge Results

The results of the post-development runoff analysis are contained in the TR-20 program output files included in Attachments 3 and 4. The results are also summarized in the following table:

Post-Development Runoff Summary  
Case 1 Tailwater El. 7.4 ft

Storm Frequency (Year)	24 Hour Rainfall Depth (in)	Runoff Depth (in)	Peak Basin Inflow (cfs)	Peak Water Level (ft)	Peak Basin Outflow (cfs)	Pre-Development Peak Discharge (cfs)
2	1.98	1.38	7.46	7.74	1.14	2.14
10	3.34	2.68	14.44	8.54	6.07	7.45
15	3.63	2.96	15.92	8.74	6.55	8.74
25	4.01	3.33	17.86	8.99	7.18	10.50
50	4.50	3.81	20.35	9.29	7.77	12.83
100	4.98	4.29	22.78	9.57	8.31	15.23

Post-Development Runoff Summary  
Case 2 Tailwater El. 5.7 ft

Storm Frequency (Year)	24 Hour Rainfall Depth (in)	Runoff Depth (in)	Peak Basin Inflow (cfs)	Peak Water Level (ft)	Peak Basin Outflow (cfs)	Pre-Development Peak Discharge (cfs)
2	1.98	1.38	7.46	7.11	1.80	2.14
10	3.34	2.68	14.44	8.22	5.79	7.45
15	3.63	2.96	15.92	8.34	7.34	8.74
25	4.01	3.33	17.86	8.48	9.29	10.50
50	4.50	3.81	20.35	8.72	9.89	12.83
100	4.98	4.29	22.78	9.00	10.34	15.23



# CALCULATION SHEET

PROJECT Russell City Energy Center

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SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

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CHECKER SWC

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SHEET REV 0

## V.7 Emergency Spillway Capacity

To determine the adequacy of the emergency spillway to pass the 100-year discharge without overtopping the basin embankment, the valve in the riser and pipe outlet structure will be closed such that at the outlet from the basin will be the emergency spillway. The starting water level in the basin will be elevation 6.0 ft. Only the 100-year storm will be modeled for this scenario. The results are contained in Attachment 5 and summarized in the following table. Note all flow over the emergency spillway will flow to the wetland area southwest of the site and not to the existing canal.

### Post-Development Emergency Spillway Summary

Storm Frequency (Year)	24 Hour Rainfall Depth (in)	Runoff Depth (in)	Peak Basin Inflow (cfs)	Peak Water Level (ft)	Peak Basin Outflow (cfs)	Pre-Development Peak Discharge (cfs)
100	4.98	4.29	22.78	10.43	8.13	15.83

## VI. Results and Conclusions

Based on the pre- and post-development runoff calculations performed the following items can be concluded:

- For all storm frequencies in both Case 1 and Case 2, the post-development peak discharge rates from the site are lower than the pre-development peak discharges.
- For Case 1, the post-development peak discharges for all storm frequencies are also lower than the estimated 15-year, pre-development peak discharge rate from the site into the existing canal of 9.0 cfs. Thus, the design capacity of the canal is not compromised by the development of the RCEC.
- For Case 2, only the 25-, 50-, and 100-year, peak discharge rates are higher than the 9.0 cfs limit. Since the canal water level in Case 2 is low, then the upstream discharges must be below capacity and thus the capacity of the canal is not compromised during low flow events.
- The maximum 100-year, water level in the basin is elevation 9.57, which is 0.43 ft below the crest of the emergency spillway and 2.43 feet below the top of the basin embankment.
- The maximum 100-year water level with the principal spillway structure closed and all flow over the emergency spillway to the wetland area southeast of the site is elevation 10.43 which is 1.57 ft below the top of the basin embankment.



## CALCULATION SHEET

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JOB NUMBER 24405

SUBJECT Preliminary Storm Water Management Basin Sizing, Pre- and Post-Development  
Runoff

CALC NO H&H-1

BY Craig J. Talbot

DATE June 11, 2001

SHEET NO 17

CHECKER SWT

DATE 6/14/01

SHEET REV 0

### VII. References

1. US Department of Agriculture, Soil Conservation Service, Technical Release 55, "Urban Hydrology for Small Watersheds", June 1986.
2. US Department of Agriculture, Soil Conservation Service, Technical Release 20, "Project Formulation Hydrology", Computer Program, Version PC 09/83(.2).
3. Alameda County Flood Control and Water Conservation District, "Plans for Construction of Line F in the Vicinity of Whitesell Street", Alameda County, California, 1980

**8.15.1.1 Climate and Precipitation**

The climate in the project area is Mediterranean (NOAA division CA-04: Central Coast) with moderate year-round temperatures and a winter rainy season.

Since 1958, normal temperatures in the area typically have exhibited a seasonal pattern ranging from winters of approximately 40-57°F (mean daily temperature of 49°F) in December and January, to summer temperatures ranging from 53-76°F (mean daily temperature of 65°F) in August and September. The average annual temperature is 59°F. The average annual evaporation pan rate is approximately 55 inches, indicating that the project site experiences evaporation rates significantly exceeding local precipitation.

The closest long-term precipitation gage is Station 62, located on the Hayward Corporation Yard, at an elevation of 55 feet msl. Between 1957 and 1992, the annual rainfall at that location averaged 17.9 inches per year. This amount is in very close agreement with the area rainfall map published for Alameda County and vicinity. As shown on this figure, the project site, with elevation of 14 feet msl, falls in an area that typically receives, on average, approximately 16 inches of rain per year. Most of this precipitation occurs during the months of October through April, while summers are relatively dry.

Table 8.15-1 lists the average rainfall amounts by month over a continuous 35-year period from 1957-1992 as recorded at Meteorological Station #62. (Frank Codd, Alameda County Public Works Agency, Flood Control and Water Conservation District, personal communication 2001.)

The California Department of Water resources and the Alameda County Public Works Agency have compiled precipitation frequency data for all of Alameda County. Table 8.15-2 summarizes the storm duration-recurrence data for the Hayward area for storm events ranging from the 2-year to the 100-year event (Jim Goodridge, California Department of Water Resources, personal communication 2001). These precipitation data are used in AFC Section 8.15.2.4 for estimating flooding impacts by calculating the expected stormwater runoff from the project site.

**Table 8.15-1. Average monthly rainfall amounts at Station #62: Hayward, CA (inches)**

Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0.05	0.05	0.34	1.23	2.57	2.60	3.40	2.95	2.92	1.36	0.28	0.14
Annual Average = 17.9 inches Source: Frank Codd, Alameda County Flood Control and Water Conservation District.											

**Table 8.15-2. Storm duration-recurrence intervals - Station #62: Hayward Corporation Yard.**

Recurrence (years)	Maximum precipitation (inches)					
	15-min.	1-hour	6-hour	12-hour	24-hour	Annual Mean
2	0.26	0.53	1.14	1.52	1.98	16.54
10	0.43	0.89	1.92	2.56	3.34	24.58
25	0.52	1.07	2.31	3.08	4.01	27.94
50	0.59	1.20	2.59	3.45	4.50	30.23
100	0.65	1.33	2.86	3.82	4.98	32.37
Sources: Alameda County Public Works Agency: Frank Codd; CA-DWR: Jim Goodridge						



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 1 OF 6

REV. NO. 0

1

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

JOB	TR-20	RCRC	PRE-DEVELOPMENT	RUNOFF ANALYSIS	FULLPRDPT	SUMMARY	NO PLOTS
TITLE	000						
TITLE	2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS						
6	RUNOFF	1	001	4	0.02422	80.	0.68 1 1 1 1
	ENDATA						
7	INCRUM	6			0.1		
7	COMPUT	7	001	001	0.0	1.98	1.0 1 2 01 02
	ENDCMP	1					
7	COMPUT	7	001	001	0.0	3.34	1.0 1 2 01 10
	ENDCMP	1					
7	COMPUT	7	001	001	0.0	3.63	1.0 1 2 01 15
	ENDCMP	1					
7	COMPUT	7	001	001	0.0	4.01	1.0 1 2 01 25
	ENDCMP	1					
7	COMPUT	7	001	001	0.0	4.50	1.0 1 2 01 50
	ENDCMP	1					
7	COMPUT	7	001	001	0.0	4.98	1.0 1 2 01 99
	ENDCMP	1					
	ENDJOB	2					

\*\*\*\*\*END OF 80-80 LIST\*\*\*\*\*



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 2 OF 6

REV. NO. 0

1

TR20 REQ 06-14-01 15:47  
REV PC 09/83(.2)

RCFC PRE-DEVELOPMENT RUNOFF ANALYSIS  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 1  
PAGE 1

EXECUTIVE CONTROL OPERATION INCREM

MAIN TIME INCREMENT = .10 HOURS

RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT

FROM XSECTION 1

TO XSECTION 1

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 1.98 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4

AREA = .02 SQ MI

INPUT RUNOFF CURVE = 80.

TIME OF CONCENTRATION = .68 HOURS

INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

PEAK TIME (HRS) 10.33 PEAK DISCHARGE (CFS) 2.14 PEAK ELEVATION (FEET) (RUNOFF)

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ. MI.
9.00	.00	.00	.01	.21
10.00	1.21	1.65	2.13	1.69
11.00	1.31	1.21	1.06	1.83
12.00	.78	.76	.73	.94
13.00	.66	.65	.64	.70
14.00	.57	.56	.55	.62
15.00	.52	.51	.51	.61
16.00	.50	.49	.49	.61
17.00	.45	.44	.44	.53
18.00	.42	.42	.41	.51
19.00	.40	.41	.41	.51
20.00	.37	.37	.36	.54
21.00	.36	.36	.36	.54
22.00	.34	.34	.33	.47
23.00	.33	.33	.33	.44
24.00	.31	.30	.28	.39
25.00	.02	.02	.01	.36

RUNOFF VOLUME ABOVE BASEFLOW = .55 WATERSHED INCHES, 8.59 CFS-HRS, .71 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCHP

COMPUTATIONS COMPLETED FOR PASS 1

RECORD ID

1

TR20 REQ 06-14-01 15:47  
REV PC 09/83(.2)

RCFC PRE-DEVELOPMENT RUNOFF ANALYSIS  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 2  
PAGE 2

EXECUTIVE CONTROL OPERATION COMPUT

FROM XSECTION 1

TO XSECTION 1

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 3.34 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 10 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4

AREA = .02 SQ MI

INPUT RUNOFF CURVE = 80.

TIME OF CONCENTRATION = .68 HOURS

INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

PEAK TIME (HRS) 10.27 PEAK DISCHARGE (CFS) 7.45 PEAK ELEVATION (FEET) (RUNOFF)

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ. MI.
7.00	.00	.00	.01	.07
8.00	.12	.14	.19	.04
9.00	.52	.59	.78	.26
10.00	5.32	6.55	7.42	1.03
				1.27
				1.76
				2.67
				3.93
				4.13



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 3 OF 6

REV. NO. 0

11.00	DISCHG	3.73	3.39	3.12	2.89	2.68	2.51	2.37	2.26	2.16	2.08
12.00	DISCHG	2.01	1.95	1.90	1.86	1.81	1.77	1.74	1.71	1.68	1.65
13.00	DISCHG	1.62	1.60	1.58	1.55	1.53	1.50	1.48	1.46	1.43	1.40
14.00	DISCHG	1.38	1.35	1.34	1.32	1.30	1.29	1.27	1.26	1.25	1.23
15.00	DISCHG	1.22	1.21	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.17
16.00	DISCHG	1.16	1.15	1.14	1.13	1.11	1.10	1.09	1.08	1.06	1.05
17.00	DISCHG	1.03	1.02	1.01	1.01	1.01	1.00	1.00	1.00	.99	.98
18.00	DISCHG	.96	.95	.94	.93	.91	.90	.89	.88	.89	.90
19.00	DISCHG	.91	.91	.92	.91	.90	.90	.89	.87	.86	.85
20.00	DISCHG	.83	.82	.81	.80	.80	.80	.80	.80	.80	.80
21.00	DISCHG	.80	.80	.80	.80	.80	.80	.80	.79	.78	.77
22.00	DISCHG	.76	.75	.74	.74	.73	.73	.73	.73	.73	.73
23.00	DISCHG	.73	.73	.73	.73	.73	.73	.73	.72	.71	.70
24.00	DISCHG	.69	.66	.61	.53	.42	.32	.23	.16	.11	.08
25.00	DISCHG	.05	.04	.02	.02	.01	.01	.01	.00		

RUNOFF VOLUME ABOVE BASEFLOW = 1.51 WATERSHED INCHES, 23.57 CFS-HRS, 1.95 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 2 RECORD ID

1

TR20 XEQ 06-14-01 15:47 RCRC PRE-DEVELOPMENT RUNOFF ANALYSIS JOB 1 PASS 3  
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 3

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO XSECTION 1 RECORD ID

STARTING TIME = .00 RAIN DEPTH = 3.63 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 15 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1  
OUTPUT HYDROGRAPH = 4  
AREA = .02 SQ MI INPUT RUNOFF CURVE = 80. TIME OF CONCENTRATION = .68 HOURS  
INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

TIME (HRS)	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)	(RUNOFF)
6.00	10.26	8.74		
7.00				
8.00				
9.00				
10.00				
11.00				
12.00				
13.00				
14.00				
15.00				
16.00				
17.00				
18.00				
19.00				
20.00				
21.00				
22.00				
23.00				
24.00				
25.00				

RUNOFF VOLUME ABOVE BASEFLOW = 1.74 WATERSHED INCHES, 27.16 CFS-HRS, 2.24 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 3 RECORD ID

1

TR20 XEQ 06-14-01 15:47 RCRC PRE-DEVELOPMENT RUNOFF ANALYSIS JOB 1 PASS 4  
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 4



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 4 OF 6

REV. NO. 0

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1 TO XSECTION 1

STARTING TIME = .00 RAIN DEPTH = 4.01 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 25 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 80. TIME OF CONCENTRATION = .68 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

PEAK TIME (HRS) 10.26 PEAK DISCHARGE (CFS) 10.50 PEAK ELEVATION (FEET) (RUNOFF)

Table with columns: TIME (HRS), DISCHG, FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Rows from 6.00 to 25.00 hours.

RUNOFF VOLUME ABOVE BASEFLOW = 2.05 WATERSHED INCHES, 31.99 CFS-HRS, 2.64 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCOMP

RECORD ID

COMPUTATIONS COMPLETED FOR PASS 4

TR20 XEQ 06-14-01 15:47
REV PC 09/83(.2)

RCEC PRE-DEVELOPMENT RUNOFF ANALYSIS
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 5
PAGE 5

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1 TO XSECTION 1

STARTING TIME = .00 RAIN DEPTH = 4.50 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 50 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 80. TIME OF CONCENTRATION = .68 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

PEAK TIME (HRS) 10.25 23.45 PEAK DISCHARGE (CFS) 12.83 1.07 PEAK ELEVATION (FEET) (RUNOFF)

Table with columns: TIME (HRS), DISCHG, FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Rows from 5.00 to 16.00 hours.



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 5 OF 6

REV. NO. 0

17.00	DISCHG	1.55	1.53	1.52	1.51	1.51	1.50	1.50	1.49	1.48	1.46
18.00	DISCHG	1.44	1.42	1.40	1.38	1.36	1.34	1.32	1.32	1.32	1.34
19.00	DISCHG	1.35	1.36	1.36	1.36	1.35	1.33	1.32	1.30	1.28	1.26
20.00	DISCHG	1.23	1.22	1.20	1.19	1.19	1.18	1.18	1.18	1.18	1.18
21.00	DISCHG	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.15	1.14
22.00	DISCHG	1.12	1.11	1.09	1.09	1.08	1.08	1.08	1.07	1.07	1.07
23.00	DISCHG	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.06	1.05	1.03
24.00	DISCHG	1.01	.97	.90	.78	.62	.47	.33	.23	.16	.11
25.00	DISCHG	.08	.05	.04	.03	.02	.01	.01	.01	.00	

RUNOFF VOLUME ABOVE BASEFLOW = 2.46 WATERSHED INCHES, 38.42 CFS-HRS, 3.17 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 5

RECORD ID

1

TR20 XEQ 06-14-01 15:47  
REV PC 09/83(.2)

RCBC PRE-DEVELOPMENT RUNOFF ANALYSIS  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 6  
PAGE 6

EXECUTIVE CONTROL OPERATION COMPUT

FROM XSECTION 1

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 4.98 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 APT. MOIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 99 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4  
AREA = .02 SQ MI INPUT RUNOFF CURVE = 80. TIME OF CONCENTRATION = .68 HOURS  
INTERNAL HYDROGRAPH TIME INCREMENT = .0907 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
10.25 15.23 (RUNOFF)  
23.45 1.22 (RUNOFF)

TIME (HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ. MI.
5.00	DISCHG .00 .00 .00 .00	.01 .01 .02 .04	.05 .07
6.00	DISCHG .09 .11 .13 .16	.18 .20 .22 .24	.27 .30
7.00	DISCHG .33 .36 .39 .42	.46 .49 .53 .57	.61 .65
8.00	DISCHG .70 .75 .80 .86	.94 1.01 1.10 1.20	1.32 1.47
9.00	DISCHG 1.63 1.79 1.97 2.20	2.45 2.74 3.24 4.28	6.20 8.77
10.00	DISCHG 11.50 13.81 15.09 15.04	14.03 12.60 11.14 9.87	8.79 7.83
11.00	DISCHG 7.01 6.34 5.79 5.33	4.93 4.60 4.32 4.10	3.91 3.75
12.00	DISCHG 3.61 3.50 3.41 3.32	3.23 3.16 3.09 3.03	2.97 2.92
13.00	DISCHG 2.87 2.82 2.78 2.73	2.68 2.64 2.59 2.55	2.50 2.45
14.00	DISCHG 2.41 2.37 2.33 2.30	2.26 2.24 2.21 2.19	2.16 2.14
15.00	DISCHG 2.11 2.10 2.08 2.07	2.07 2.06 2.06 2.05	2.04 2.02
16.00	DISCHG 2.00 1.98 1.96 1.94	1.91 1.89 1.87 1.84	1.82 1.79
17.00	DISCHG 1.77 1.75 1.73 1.72	1.72 1.71 1.71 1.70	1.68 1.66
18.00	DISCHG 1.64 1.62 1.60 1.57	1.55 1.52 1.50 1.50	1.50 1.52
19.00	DISCHG 1.53 1.55 1.55 1.54	1.53 1.51 1.50 1.48	1.45 1.43
20.00	DISCHG 1.40 1.38 1.37 1.36	1.35 1.34 1.34 1.34	1.34 1.34
21.00	DISCHG 1.34 1.34 1.34 1.34	1.34 1.34 1.33 1.33	1.31 1.29
22.00	DISCHG 1.27 1.25 1.24 1.23	1.23 1.22 1.22 1.22	1.22 1.22
23.00	DISCHG 1.21 1.21 1.21 1.22	1.22 1.22 1.21 1.20	1.19 1.17
24.00	DISCHG 1.14 1.10 1.02 .88	.71 .53 .38 .26	.18 .13
25.00	DISCHG .09 .06 .04 .03	.02 .01 .01 .01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 2.87 WATERSHED INCHES, 44.88 CFS-HRS, 3.71 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 6

RECORD ID

EXECUTIVE CONTROL OPERATION ENDJOB

RECORD ID



ATTACHMENT NO. 2

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 6 OF 6

REV. NO. 0

1

TR20 XEQ 06-14-01 15:47  
REV PC 09/83(.2)

RCEC PRE-DEVELOPMENT RUNOFF ANALYSIS  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 7

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED  
(A STAR (\*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH  
A QUESTION MARK (?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	AMTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 2													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	1.98	24.00	.55	---	10.33	2.14	88.3
ALTERNATE 1 STORM 10													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	3.34	24.00	1.51	---	10.27	7.45	307.4
ALTERNATE 1 STORM 15													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	3.63	24.00	1.74	---	10.26	8.74	361.0
ALTERNATE 1 STORM 25													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	4.01	24.00	2.05	---	10.26	10.50	433.4
ALTERNATE 1 STORM 50													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	4.50	24.00	2.46	---	10.25	12.83	529.9
ALTERNATE 1 STORM 99													
+ XSECTION 1	RUNOFF	.02	1	2	.10	.0	4.98	24.00	2.87	---	10.25	15.23	628.8

TR20 XEQ 06-14-01 15:47  
REV PC 09/83(.2)

RCEC PRE-DEVELOPMENT RUNOFF ANALYSIS  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 8

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....					
		2	10	15	25	50	99
0 XSECTION 1	.02						
+ ALTERNATE 1		2.14	7.45	8.74	10.50	12.83	15.23

1 END OF 1 JOBS IN THIS RUN



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 1 OF 11

REV. NO. 0

1

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

JOB TR-20	FULLPRINT	SUMMARY	NO PLOTS
TITLE 001 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1			
TITLE 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS			
3 STRUCT 01			
8	5.0	0.0	0.0
8	6.0	0.000001	0.23
8	7.0	0.000002	0.64
8	7.4	0.000003	0.76
8	7.5	0.67	0.79
8	8.0	1.65	0.94
8	8.25	5.25	1.05
8	8.50	5.97	1.16
8	9.0	7.20	1.38
8	10.0	9.17	1.87
8	10.25	13.11	2.01
8	10.50	19.92	2.15
8	11.0	38.8	2.42
8	12.0	91.4	3.03
9 ENDTBL			
6 RUNOFF 1 001	4 0.0184	94.	0.286
6 RESVOR 2 01 4 5 6.0			1 1 1 1 1
ENDATA			
7 INCRIM 6	0.1		
7 COMPUT 7 001 01 0.0	1.98	1.0	1 2 01 02
ENDCMP 1			
7 COMPUT 7 001 01 0.0	3.34	1.0	1 2 01 10
ENDCMP 1			
7 COMPUT 7 001 01 0.0	3.63	1.0	1 2 01 15
ENDCMP 1			
7 COMPUT 7 001 01 0.0	4.01	1.0	1 2 01 25
ENDCMP 1			
7 COMPUT 7 001 01 0.0	4.50	1.0	1 2 01 50
ENDCMP 1			
7 COMPUT 7 001 01 0.0	4.98	1.0	1 2 01 99
ENDCMP 1			
ENDJOB 2			

0\*\*\*\*\*END OF 80-80 LIST\*\*\*\*\*



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JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 2 OF 11

REV. NO. 0

1

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 1  
PAGE 1

EXECUTIVE CONTROL OPERATION INCREM

MAIN TIME INCREMENT = .10 HOURS

RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT

FROM XSECTION 1

TO STRUCTURE 1

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 1.98 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4  
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

PEAK TIME (HRS) 10.01 PEAK DISCHARGE (CFS) 7.46 PEAK ELEVATION (FEET) (RUNOFF)

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ. MI.
3.00	.00	.00	.00	.01
4.00	.02	.03	.04	.08
5.00	.09	.10	.12	.17
6.00	.18	.18	.20	.27
7.00	.28	.29	.33	.43
8.00	.44	.46	.56	.85
9.00	.94	1.01	1.33	1.47
10.00	7.45	7.14	5.36	3.84
11.00	1.70	1.63	1.48	1.36
12.00	1.12	1.10	1.06	1.02
13.00	.92	.91	.88	.86
14.00	.76	.76	.74	.73
15.00	.68	.68	.68	.68
16.00	.64	.64	.62	.61
17.00	.56	.56	.56	.56
18.00	.52	.51	.50	.49
19.00	.52	.51	.50	.49
20.00	.44	.44	.44	.44
21.00	.44	.44	.44	.44
22.00	.39	.39	.39	.39
23.00	.39	.39	.39	.39
24.00	.35	.31	.18	.08

RUNOFF VOLUME ABOVE BASEFLOW = 1.38 WATERSHED INCHES, 16.35 CFS-HRS, 1.35 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1

INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5  
SURFACE ELEVATION = 6.00

\*\*\* WARNING-NO PEAK FOUND, MAXIMUM DISCHARGE = .51 CFS.

1

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 1  
PAGE 2

PEAK TIME (HRS) 19.10 PEAK DISCHARGE (CFS) .51 PEAK ELEVATION (FEET) 7.48  
11.80 1.14 7.74

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ. MI.
10.00	.00	.00	.00	.27
10.00	ELEV	5.00	5.00	7.44
11.00	DISCHG	1.03	1.07	1.12
11.00	ELEV	7.69	7.70	7.72
12.00	DISCHG	1.14	1.14	1.13
12.00	ELEV	7.74	7.74	7.73
13.00	DISCHG	1.08	1.07	1.06
13.00	ELEV	7.71	7.71	7.70
14.00	DISCHG	.98	.96	.95
14.00	ELEV	7.66	7.65	7.64



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

JOB NUMBER 24405

CALC NO H&H-1

SHEET NO 3 OF 11

REV. NO. 0

15.00	DISCHG	.87	.86	.85	.84	.83	.82	.82	.81	.80	.79
15.00	ELEV	7.60	7.60	7.59	7.59	7.58	7.58	7.57	7.57	7.57	7.56
16.00	DISCHG	.78	.78	.77	.76	.75	.75	.74	.73	.72	.71
16.00	ELEV	7.56	7.55	7.55	7.55	7.54	7.54	7.53	7.53	7.53	7.52
17.00	DISCHG	.71	.70	.69	.68	.68	.67	.65	.64	.62	.60
17.00	ELEV	7.52	7.51	7.51	7.51	7.50	7.50	7.50	7.49	7.49	7.49
18.00	DISCHG	.59	.58	.56	.55	.54	.53	.52	.52	.51	.51
18.00	ELEV	7.49	7.49	7.48	7.48	7.48	7.48	7.48	7.48	7.48	7.48
19.00	DISCHG	.51	.51	.51	.51	.51	.50	.50	.49	.48	.48
19.00	ELEV	7.48	7.48	7.48	7.48	7.48	7.47	7.47	7.47	7.47	7.47
20.00	DISCHG	.47	.46	.46	.46	.45	.45	.45	.45	.44	.44
20.00	ELEV	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.47
21.00	DISCHG	.44	.44	.44	.44	.44	.44	.44	.43	.43	.43
21.00	ELEV	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.46	7.46	7.46
22.00	DISCHG	.42	.42	.41	.41	.41	.40	.40	.40	.40	.40
22.00	ELEV	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46
23.00	DISCHG	.40	.40	.40	.40	.40	.40	.40	.39	.39	.38
23.00	ELEV	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46
24.00	DISCHG	.38	.37	.35	.31	.27	.23	.19	.16	.13	.11
24.00	ELEV	7.46	7.46	7.45	7.45	7.44	7.43	7.43	7.42	7.42	7.42
25.00	DISCHG	.09	.08	.06	.05	.04	.04	.03	.02	.02	.02
25.00	ELEV	7.41	7.41	7.41	7.41	7.41	7.41	7.40	7.40	7.40	7.40
26.00	DISCHG	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
26.00	ELEV	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40

RUNOFF VOLUME ABOVE BASEFLOW = .84 WATERSHED INCHES, 9.93 CFS-HRS, .82 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 1

RECORD ID

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 2  
PAGE 3

EXECUTIVE CONTROL OPERATION COMPUT

FROM KSECTION 1

TO STRUCTURE 1

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 3.34 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. WDIST. COND = 2  
ALTERNATE NO. = 1 STORM NO. = 10 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4  
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT =	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)	TIME INCREMENT =	DRAINAGE AREA =
		.00 HOURS	14.44	(RUNOFF)	.10 HOURS	.02 SQ. MI.
2.00	DISCHG	.00	.00	.01	.02	.05
3.00	DISCHG	.09	.11	.14	.16	.17
4.00	DISCHG	.24	.25	.27	.29	.31
5.00	DISCHG	.38	.39	.44	.47	.48
6.00	DISCHG	.56	.57	.60	.61	.62
7.00	DISCHG	.76	.78	.83	.87	.91
8.00	DISCHG	1.07	1.12	1.24	1.33	1.41
9.00	DISCHG	2.09	2.23	2.58	2.87	3.01
10.00	DISCHG	14.44	13.65	10.17	7.23	5.95
11.00	DISCHG	3.12	2.99	2.70	2.48	2.38
12.00	DISCHG	2.04	2.00	1.92	1.85	1.81
13.00	DISCHG	1.67	1.64	1.59	1.54	1.53
14.00	DISCHG	1.37	1.36	1.33	1.31	1.30
15.00	DISCHG	1.22	1.22	1.22	1.22	1.22
16.00	DISCHG	1.15	1.14	1.11	1.09	1.08
17.00	DISCHG	1.00	.99	.99	.99	.99
18.00	DISCHG	.92	.91	.88	.86	.85
19.00	DISCHG	.92	.91	.88	.86	.85
20.00	DISCHG	.77	.77	.77	.77	.77
21.00	DISCHG	.77	.77	.77	.77	.77
22.00	DISCHG	.70	.69	.69	.69	.69
23.00	DISCHG	.69	.69	.69	.69	.69
24.00	DISCHG	.62	.54	.32	.14	.06

RUNOFF VOLUME ABOVE BASEFLOW = 2.68 WATERSHED INCHES, 31.81 CFS-HRS, 2.63 ACRE-FEET; BASEFLOW = .00 CFS



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 4 OF 11

REV. NO. 0

OPERATION RESVOR STRUCTURE 1  
 INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5  
 SURFACE ELEVATION= 6.00

PEAK TIME(HRS) 10.41 PEAK DISCHARGE(CFS) 6.07 PEAK ELEVATION(FEET) 8.54

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ.MI.

TR20 XEQ 06-12-01 15:12 RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1 JOB 1 PASS 2  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 4

9.00	DISCRG	.00	.00	.00	.00	.00	.00	.00	.00	1.00	1.62
9.00	ELEV	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	7.67	7.98
10.00	DISCRG	4.45	5.58	5.91	6.05	6.07	6.05	6.01	5.94	5.83	5.70
10.00	ELEV	8.19	8.36	8.48	8.53	8.54	8.53	8.52	8.49	8.45	8.41
11.00	DISCRG	5.57	5.43	5.30	4.82	4.25	3.80	3.45	3.16	2.91	2.71
11.00	ELEV	8.36	8.31	8.27	8.22	8.18	8.15	8.12	8.10	8.09	8.07
12.00	DISCRG	2.55	2.43	2.32	2.21	2.12	2.05	1.99	1.94	1.88	1.84
12.00	ELEV	8.06	8.05	8.05	8.04	8.03	8.03	8.02	8.02	8.02	8.01
13.00	DISCRG	1.80	1.76	1.73	1.69	1.65	1.64	1.64	1.63	1.62	1.60
13.00	ELEV	8.01	8.01	8.01	8.00	8.00	8.00	7.99	7.99	7.98	7.98
14.00	DISCRG	1.59	1.58	1.57	1.55	1.54	1.53	1.52	1.50	1.49	1.48
14.00	ELEV	7.97	7.96	7.96	7.95	7.94	7.94	7.93	7.92	7.92	7.91
15.00	DISCRG	1.46	1.45	1.44	1.43	1.41	1.40	1.39	1.38	1.37	1.36
15.00	ELEV	7.90	7.90	7.89	7.89	7.88	7.87	7.87	7.86	7.86	7.85
16.00	DISCRG	1.35	1.34	1.33	1.32	1.30	1.29	1.28	1.27	1.25	1.24
16.00	ELEV	7.85	7.84	7.84	7.83	7.82	7.82	7.81	7.80	7.80	7.79
17.00	DISCRG	1.23	1.22	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.13
17.00	ELEV	7.78	7.78	7.77	7.77	7.76	7.76	7.75	7.75	7.74	7.74
18.00	DISCRG	1.12	1.11	1.10	1.09	1.07	1.06	1.05	1.04	1.03	1.03
18.00	ELEV	7.73	7.72	7.72	7.71	7.71	7.70	7.69	7.69	7.69	7.68
19.00	DISCRG	1.02	1.02	1.01	1.00	.99	.99	.98	.97	.96	.95
19.00	ELEV	7.68	7.68	7.67	7.67	7.67	7.66	7.66	7.65	7.65	7.64
20.00	DISCRG	.94	.93	.92	.92	.91	.90	.89	.89	.88	.88
20.00	ELEV	7.64	7.63	7.63	7.63	7.62	7.62	7.61	7.61	7.61	7.60
21.00	DISCRG	.87	.86	.86	.85	.85	.85	.84	.84	.83	.82
21.00	ELEV	7.60	7.60	7.60	7.59	7.59	7.59	7.59	7.58	7.58	7.58
22.00	DISCRG	.82	.81	.80	.80	.79	.79	.78	.78	.77	.77
22.00	ELEV	7.58	7.57	7.57	7.57	7.56	7.56	7.56	7.55	7.55	7.55
23.00	DISCRG	.77	.76	.76	.75	.75	.75	.75	.74	.74	.73
23.00	ELEV	7.55	7.55	7.54	7.54	7.54	7.54	7.54	7.53	7.53	7.53
24.00	DISCRG	.72	.72	.70	.68	.59	.50	.42	.35	.29	.24
24.00	ELEV	7.53	7.52	7.52	7.50	7.49	7.47	7.46	7.45	7.44	7.44
25.00	DISCRG	.20	.17	.14	.12	.10	.08	.07	.05	.05	.04
25.00	ELEV	7.43	7.42	7.42	7.42	7.41	7.41	7.41	7.41	7.41	7.41
26.00	DISCRG	.03	.03	.02	.02	.02	.01	.01	.01	.01	.01
26.00	ELEV	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40	7.40

RUNOFF VOLUME ABOVE BASEFLOW = 2.13 WATERSHED INCHES, 25.34 CFS-HRS, 2.09 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID  
 + COMPUTATIONS COMPLETED FOR PASS 2

TR20 XEQ 06-12-01 15:12 RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1 JOB 1 PASS 3  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 5

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO STRUCTURE 1 RECORD ID  
 + STARTING TIME = .00 RAIN DEPTH = 3.63 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2  
 + ALTERNATE NO. = 1 STORM NO. = 15 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1  
 OUTPUT HYDROGRAPH= 4  
 AREA= .02 SQ MI INPUT RUNOFF CURVE= 94. TIME OF CONCENTRATION= .29 HOURS  
 INTERNAL HYDROGRAPH TIME INCREMENT= .0381 HOURS

PEAK TIME(HRS) 10.00 PEAK DISCHARGE(CFS) 15.92 PEAK ELEVATION(FEET) (RUNOFF)



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 5 OF 11

REV. NO. 0

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT =	.00 HOURS	TIME INCREMENT =	.10 HOURS	DRAINAGE AREA =	.02 SQ. MI.
2.00	.00	.00	.01	.02	.03	.05	.07
3.00	.13	.15	.16	.18	.19	.20	.22
4.00	.29	.31	.32	.33	.34	.36	.37
5.00	.45	.47	.49	.52	.54	.55	.57
6.00	.65	.67	.68	.69	.70	.71	.73
7.00	.87	.89	.95	.99	1.02	1.04	1.06
8.00	1.22	1.27	1.40	1.50	1.56	1.59	1.70
9.00	2.34	2.50	2.88	3.20	3.36	3.47	5.00
10.00	15.92	15.03	11.19	7.94	6.53	5.92	5.40
11.00	3.42	3.27	2.96	2.72	2.61	2.57	2.51
12.00	2.23	2.19	2.10	2.03	2.00	1.99	1.96
13.00	1.82	1.80	1.74	1.69	1.67	1.66	1.64
14.00	1.50	1.48	1.45	1.43	1.42	1.41	1.40
15.00	1.33	1.33	1.33	1.33	1.33	1.32	1.29
16.00	1.25	1.24	1.21	1.19	1.17	1.17	1.16
17.00	1.09	1.09	1.09	1.09	1.09	1.09	1.08
18.00	1.01	.99	.96	.94	.93	.92	.93
19.00	1.00	.99	.96	.94	.93	.92	.91
20.00	.84	.84	.84	.84	.84	.84	.84
21.00	.84	.84	.84	.84	.84	.84	.83
22.00	.76	.76	.76	.76	.76	.76	.76
23.00	.76	.76	.76	.76	.76	.76	.75
24.00	.67	.59	.35	.15	.06	.03	.01

RUNOFF VOLUME ABOVE BASEFLOW = 2.96 WATERSHED INCHES, 35.16 CFS-HRS, 2.91 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1  
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5  
SURFACE ELEVATION= 6.00

PEAK TIME (HRS) 10.42 PEAK DISCHARGE (CFS) 6.55 PEAK ELEVATION (FEET) 8.74

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT =	.00 HOURS	TIME INCREMENT =	.10 HOURS	DRAINAGE AREA =	.02 SQ. MI.
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TR20 REQ 06-12-01 15:12 RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
REV PC 09/83(2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 3  
PAGE 6

9.00	DISCHG	.00	.00	.00	.00	.00	.31	.92	1.47	3.83
9.00	ELEV	5.00	5.00	5.00	5.00	5.00	7.45	7.63	7.91	8.15
10.00	DISCHG	5.55	6.06	6.38	6.52	6.55	6.54	6.43	6.33	6.21
10.00	ELEV	8.35	8.54	8.67	8.72	8.74	8.73	8.71	8.69	8.65
11.00	DISCHG	6.08	5.96	5.81	5.65	5.50	5.34	5.00	4.39	3.90
11.00	ELEV	8.55	8.50	8.44	8.39	8.34	8.28	8.23	8.19	8.16
12.00	DISCHG	3.21	2.97	2.77	2.61	2.46	2.35	2.26	2.18	2.11
12.00	ELEV	8.11	8.09	8.08	8.07	8.06	8.05	8.04	8.04	8.03
13.00	DISCHG	1.99	1.95	1.91	1.86	1.82	1.78	1.75	1.72	1.68
13.00	ELEV	8.02	8.02	8.02	8.01	8.01	8.01	8.01	8.00	8.00
14.00	DISCHG	1.64	1.63	1.62	1.61	1.60	1.59	1.58	1.57	1.56
14.00	ELEV	7.99	7.99	7.99	7.98	7.98	7.97	7.97	7.96	7.96
15.00	DISCHG	1.54	1.53	1.52	1.51	1.50	1.49	1.48	1.47	1.46
15.00	ELEV	7.94	7.94	7.93	7.93	7.92	7.92	7.91	7.91	7.90
16.00	DISCHG	1.44	1.43	1.42	1.41	1.40	1.38	1.37	1.36	1.35
16.00	ELEV	7.89	7.89	7.88	7.88	7.87	7.86	7.86	7.85	7.85
17.00	DISCHG	1.32	1.31	1.30	1.29	1.28	1.27	1.26	1.25	1.23
17.00	ELEV	7.83	7.83	7.82	7.81	7.81	7.80	7.80	7.79	7.79
18.00	DISCHG	1.21	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.12
18.00	ELEV	7.78	7.77	7.76	7.76	7.75	7.75	7.74	7.73	7.73
19.00	DISCHG	1.11	1.10	1.10	1.09	1.08	1.07	1.06	1.06	1.05
19.00	ELEV	7.72	7.72	7.72	7.71	7.71	7.71	7.70	7.70	7.69
20.00	DISCHG	1.02	1.02	1.01	1.00	.99	.98	.97	.97	.96
20.00	ELEV	7.68	7.68	7.67	7.67	7.66	7.66	7.65	7.65	7.64
21.00	DISCHG	.95	.94	.94	.93	.93	.92	.92	.91	.90
21.00	ELEV	7.64	7.64	7.64	7.63	7.63	7.63	7.62	7.62	7.62
22.00	DISCHG	.89	.88	.88	.87	.86	.86	.85	.85	.84
22.00	ELEV	7.61	7.61	7.61	7.60	7.60	7.60	7.59	7.59	7.59
23.00	DISCHG	.83	.83	.83	.82	.82	.81	.81	.81	.80
23.00	ELEV	7.58	7.58	7.58	7.58	7.58	7.57	7.57	7.57	7.56
24.00	DISCHG	.79	.78	.77	.74	.71	.67	.56	.47	.39
24.00	ELEV	7.56	7.56	7.55	7.53	7.52	7.50	7.48	7.47	7.46
25.00	DISCHG	.27	.22	.19	.15	.13	.11	.09	.07	.06
25.00	ELEV	7.44	7.43	7.43	7.42	7.42	7.42	7.41	7.41	7.41
26.00	DISCHG	.04	.04	.03	.02	.02	.02	.01	.01	.01
26.00	ELEV	7.41	7.41	7.40	7.40	7.40	7.40	7.40	7.40	7.40

RUNOFF VOLUME ABOVE BASEFLOW = 2.42 WATERSHED INCHES, 28.74 CFS-HRS, 2.38 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

RECORD ID



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 6 OF 11

REV. NO. 0

COMPUTATIONS COMPLETED FOR PASS 3

TR20 XEQ 06-12-01 15:12
REV PC 09/83(.2)

RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 4
PAGE 7

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1 TO STRUCTURE 1

STARTING TIME = .00 RAIN DEPTH = 4.01 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 25 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

PEAK TIME (HRS) 10.00 PEAK DISCHARGE (CFS) 17.86 PEAK ELEVATION (FEET) (RUNOFF)

Table with columns: TIME (HRS), DISCHG, FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Rows from 2.00 to 24.00.

RUNOFF VOLUME ABOVE BASEFLOW = 3.33 WATERSHED INCHES, 39.57 CFS-HRS, 3.27 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1

INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5
SURFACE ELEVATION = 6.00

PEAK TIME (HRS) 10.43 PEAK DISCHARGE (CFS) 7.18 PEAK ELEVATION (FEET) 8.99

TIME (HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ.MI.

TR20 XEQ 06-12-01 15:12
REV PC 09/83(.2)

RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 4
PAGE 8

Table with columns: TIME, DISCHG, ELEV, and values for various time intervals from 9.00 to 15.00.



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 7 OF 11

REV. NO. 0

15.00	ELEV	7.98	7.98	7.98	7.97	7.97	7.97	7.96	7.96	7.96	7.95
16.00	DISCHG	1.55	1.54	1.53	1.52	1.51	1.50	1.49	1.47	1.46	1.45
16.00	ELEV	7.95	7.94	7.94	7.93	7.93	7.92	7.92	7.91	7.90	7.90
17.00	DISCHG	1.44	1.42	1.41	1.40	1.39	1.38	1.37	1.36	1.35	1.34
17.00	ELEV	7.89	7.89	7.88	7.87	7.87	7.86	7.86	7.85	7.85	7.84
18.00	DISCHG	1.33	1.32	1.30	1.29	1.28	1.26	1.25	1.24	1.23	1.23
18.00	ELEV	7.84	7.83	7.82	7.82	7.81	7.80	7.80	7.79	7.79	7.78
19.00	DISCHG	1.22	1.21	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.14
19.00	ELEV	7.78	7.78	7.77	7.77	7.77	7.76	7.76	7.75	7.75	7.74
20.00	DISCHG	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.07	1.06	1.05
20.00	ELEV	7.74	7.73	7.73	7.72	7.72	7.71	7.71	7.70	7.70	7.70
21.00	DISCHG	1.05	1.04	1.04	1.03	1.02	1.02	1.01	1.01	1.00	.99
21.00	ELEV	7.69	7.69	7.69	7.68	7.68	7.68	7.68	7.67	7.67	7.67
22.00	DISCHG	.99	.98	.97	.96	.96	.95	.95	.94	.93	.93
22.00	ELEV	7.66	7.66	7.65	7.65	7.65	7.64	7.64	7.64	7.63	7.63
23.00	DISCHG	.92	.92	.92	.91	.91	.90	.90	.90	.89	.88
23.00	ELEV	7.63	7.63	7.63	7.62	7.62	7.62	7.62	7.62	7.61	7.61
24.00	DISCHG	.88	.87	.85	.82	.78	.74	.71	.67	.55	.46
24.00	ELEV	7.61	7.60	7.59	7.58	7.56	7.54	7.52	7.50	7.48	7.47
25.00	DISCHG	.38	.32	.26	.22	.18	.15	.13	.10	.09	.07
25.00	ELEV	7.46	7.45	7.44	7.43	7.43	7.42	7.42	7.42	7.41	7.41
26.00	DISCHG	.06	.05	.04	.03	.03	.02	.02	.02	.01	.01
26.00	ELEV	7.41	7.41	7.41	7.41	7.40	7.40	7.40	7.40	7.40	7.40
27.00	DISCHG	.01	.01								
27.00	ELEV	7.40	7.40								

RUNOFF VOLUME ABOVE BASEFLOW = 2.79 WATERSHED INCHES, 33.14 CFS-HRS, 2.74 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION EMDCMP COMPUTATIONS COMPLETED FOR PASS 4 RECORD ID

TR20 XEQ 06-12-01 15:12 RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1 JOB 1 PASS 5
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORES PAGE 9

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO STRUCTURE 1 RECORD ID
STARTING TIME = .00 RAIN DEPTH = 4.50 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 50 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1  
OUTPUT HYDROGRAPH = 4  
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
INTERVAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

TIME (HRS)	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)	DRAINAGE AREA =
	10.00	20.35	(RUNOFF)	.02 SQ. MI.
1.00	DISCHG	.00	.00	.00
2.00	DISCHG	.04	.11	.21
3.00	DISCHG	.27	.32	.38
4.00	DISCHG	.48	.53	.58
5.00	DISCHG	.68	.77	.83
6.00	DISCHG	.94	.98	1.03
7.00	DISCHG	1.26	1.36	1.46
8.00	DISCHG	1.65	2.02	2.27
9.00	DISCHG	3.09	4.20	4.53
10.00	DISCHG	20.35	10.08	6.83
11.00	DISCHG	4.31	3.43	3.29
12.00	DISCHG	2.80	2.55	2.50
13.00	DISCHG	2.29	2.12	2.10
14.00	DISCHG	1.88	1.79	1.77
15.00	DISCHG	1.67	1.67	1.66
16.00	DISCHG	1.57	1.48	1.47
17.00	DISCHG	1.36	1.36	1.35
18.00	DISCHG	1.26	1.17	1.16
19.00	DISCHG	1.25	1.18	1.16
20.00	DISCHG	1.05	1.05	1.05
21.00	DISCHG	1.05	1.05	1.05
22.00	DISCHG	.95	.94	.94
23.00	DISCHG	.94	.94	.93
24.00	DISCHG	.84	.19	.08

RUNOFF VOLUME ABOVE BASEFLOW = 3.81 WATERSHED INCHES, 45.29 CFS-HRS, 3.74 ACRE-FEET; BASEFLOW = .00 CFS



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 8 OF 11

REV. NO. 0

OPERATION RESVOR STRUCTURE 1
INPUT HYDROGRAPH= 4
SURFACE ELEVATION= 6.00
OUTPUT HYDROGRAPH= 5

PEAK TIME (HRS) 10.47
PEAK DISCHARGE (CFS) 7.77
PEAK ELEVATION (FEET) 9.29

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1 JOB 1 PASS 5
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 10

Table with columns: TIME (HRS), DISCHG, ELEV, FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Contains 24 rows of data for various time intervals from 9:00 to 27:00.

RUNOFF VOLUME ABOVE BASEFLOW = 3.27 WATERSHED INCHES, 38.85 CFS-HRS, 3.21 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 5 RECORD ID

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1 JOB 1 PASS 6
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 11

EXECUTIVE CONTROL OPERATION COMPUT FROM SECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 4.98 RAIN DURATION= 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND= 2
ALTERNATE NO. = 1 STORM NO.=99 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1
OUTPUT HYDROGRAPH= 4
AREA= .02 SQ MI INPUT RUNOFF CURVE= 94. TIME OF CONCENTRATION= .29 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0381 HOURS



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 8 OF 11

REV. NO. 0

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT =	.00 HOURS	TIME INCREMENT =	.10 HOURS	DRAINAGE AREA =	.02 SQ. MI.
10.00			22.78				
23.36			1.05				
1.00	DISCHG	.00	.00	.00	.00	.01	.03
2.00	DISCHG	.08	.11	.14	.17	.20	.23
3.00	DISCHG	.35	.37	.39	.41	.43	.45
4.00	DISCHG	.59	.61	.62	.64	.66	.67
5.00	DISCHG	.81	.83	.87	.91	.93	.95
6.00	DISCHG	1.10	1.12	1.13	1.14	1.16	1.17
7.00	DISCHG	1.39	1.43	1.51	1.57	1.61	1.64
8.00	DISCHG	1.89	1.96	2.15	2.31	2.39	2.43
9.00	DISCHG	3.51	3.74	4.29	4.75	4.97	5.12
10.00	DISCHG	22.77	21.41	15.89	11.26	9.24	8.35
11.00	DISCHG	4.80	4.60	4.16	3.81	3.66	3.60
12.00	DISCHG	3.12	3.07	2.94	2.84	2.79	2.78
13.00	DISCHG	2.55	2.51	2.43	2.36	2.33	2.32
14.00	DISCHG	2.09	2.07	2.03	1.99	1.98	1.97
15.00	DISCHG	1.86	1.85	1.85	1.85	1.85	1.85
16.00	DISCHG	1.74	1.73	1.68	1.65	1.63	1.63
17.00	DISCHG	1.51	1.51	1.51	1.51	1.51	1.51
18.00	DISCHG	1.40	1.38	1.34	1.30	1.29	1.28
19.00	DISCHG	1.39	1.38	1.34	1.30	1.29	1.28
20.00	DISCHG	1.17	1.17	1.16	1.16	1.16	1.16
21.00	DISCHG	1.16	1.16	1.16	1.16	1.16	1.16
22.00	DISCHG	1.05	1.05	1.05	1.05	1.05	1.05
23.00	DISCHG	1.05	1.05	1.05	1.05	1.05	1.05
24.00	DISCHG	.93	.82	.48	.21	.09	.04

RUNOFF VOLUME ABOVE BASEFLOW = 4.29 WATERSHED INCHES, 50.90 CFS-HRS, 4.21 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1  
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5  
SURFACE ELEVATION= 6.00

PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
10.51	8.31	9.57

TR20 REQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
REV FC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 6  
PAGE 12

TIME (HRS)	DISCHG	FIRST HYDROGRAPH POINT =	.00 HOURS	TIME INCREMENT =	.10 HOURS	DRAINAGE AREA =	.02 SQ. MI.
8.00	DISCHG	.00	.00	.00	.00	.26	.67
8.00	ELEV	5.00	5.00	5.00	5.00	7.44	7.50
9.00	DISCHG	1.07	1.20	1.35	1.52	1.85	2.61
9.00	ELEV	7.70	7.77	7.85	7.93	8.01	8.07
10.00	DISCHG	7.21	7.69	8.05	8.23	8.30	8.31
10.00	ELEV	9.00	9.25	9.43	9.52	9.56	9.56
11.00	DISCHG	7.98	7.87	7.76	7.63	7.51	7.38
11.00	ELEV	9.40	9.34	9.28	9.22	9.16	9.09
12.00	DISCHG	6.60	6.44	6.28	6.13	5.98	5.81
12.00	ELEV	8.76	8.69	8.63	8.57	8.50	8.45
13.00	DISCHG	4.44	3.98	3.62	3.33	3.09	2.91
13.00	ELEV	8.19	8.16	8.14	8.12	8.10	8.09
14.00	DISCHG	2.35	2.29	2.23	2.18	2.13	2.09
14.00	ELEV	8.05	8.04	8.04	8.04	8.03	8.03
15.00	DISCHG	1.94	1.92	1.91	1.89	1.88	1.88
15.00	ELEV	8.02	8.02	8.02	8.02	8.02	8.02
16.00	DISCHG	1.80	1.79	1.77	1.74	1.72	1.70
16.00	ELEV	8.01	8.01	8.01	8.01	8.00	8.00
17.00	DISCHG	1.63	1.63	1.62	1.61	1.61	1.60
17.00	ELEV	7.99	7.99	7.99	7.98	7.98	7.97
18.00	DISCHG	1.57	1.56	1.55	1.53	1.52	1.51
18.00	ELEV	7.96	7.95	7.95	7.94	7.93	7.92
19.00	DISCHG	1.47	1.47	1.46	1.45	1.45	1.44
19.00	ELEV	7.91	7.91	7.90	7.90	7.89	7.89
20.00	DISCHG	1.38	1.37	1.36	1.35	1.34	1.33
20.00	ELEV	7.86	7.86	7.85	7.85	7.84	7.83
21.00	DISCHG	1.29	1.29	1.28	1.27	1.27	1.26
21.00	ELEV	7.82	7.81	7.81	7.81	7.80	7.80
22.00	DISCHG	1.22	1.21	1.21	1.20	1.19	1.18
22.00	ELEV	7.78	7.78	7.77	7.77	7.76	7.76
23.00	DISCHG	1.15	1.14	1.14	1.13	1.13	1.13
23.00	ELEV	7.74	7.74	7.74	7.74	7.73	7.73
24.00	DISCHG	1.09	1.08	1.06	1.02	.97	.93
24.00	ELEV	7.72	7.71	7.70	7.68	7.66	7.63
25.00	DISCHG	.71	.67	.56	.47	.39	.32



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

CALC NO H&H-1

SHEET NO 10 OF 11

REV. NO. 0

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

25.00	ELEV	7.52	7.50	7.48	7.47	7.46	7.45	7.44	7.43	7.43	7.42
26.00	DISCHG	.13	.11	.09	.07	.06	.05	.04	.04	.03	.02
26.00	ELEV	7.42	7.42	7.41	7.41	7.41	7.41	7.41	7.41	7.40	7.40
27.00	DISCHG	.02	.02	.01	.01	.01	.01				
27.00	ELEV	7.40	7.40	7.40	7.40	7.40	7.40				

RUNOFF VOLUME ABOVE BASEFLOW = 3.75 WATERSHED INCHES, 44.48 CFS-HRS, 3.68 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 6

RECORD ID

1

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 7  
PAGE 13

EXECUTIVE CONTROL OPERATION ENDOJOB

RECORD ID



ATTACHMENT NO. 3

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 11 OF 11

REV. NO. 0

1

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 14

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED  
(A STAR (\*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH  
A QUESTION MARK (?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	RAIN TIME INCR (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE				
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)	
ALTERNATE 1 STORM 2														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	1.98	24.00	1.38	---	10.01	7.46	405.6
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	1.98	24.00	.84	7.74	11.80	1.14	62.1
ALTERNATE 1 STORM 10														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	3.34	24.00	2.68	---	10.00	14.44	784.8
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	3.34	24.00	2.13	8.54	10.41	6.07	329.9
ALTERNATE 1 STORM 15														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	3.63	24.00	2.96	---	10.00	15.92	865.4
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	3.63	24.00	2.42	8.74	10.42	6.55	356.2
ALTERNATE 1 STORM 25														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	4.01	24.00	3.33	---	10.00	17.86	970.6
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	4.01	24.00	2.79	8.99	10.43	7.18	390.3
ALTERNATE 1 STORM 50														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	4.50	24.00	3.81	---	10.00	20.35	1105.9
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	4.50	24.00	3.27	9.29	10.47	7.77	422.4
ALTERNATE 1 STORM 99														
XSECTION	1	RUNOFF	.02	1	2	.10	.0	4.98	24.00	4.29	---	10.00	22.78	1237.8
STRUCTURE	1	RESVOR	.02	1	2	.10	.0	4.98	24.00	3.75	9.57	10.51	8.31	451.8

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 1  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 15

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....						
		2	10	15	25	50	99	
0 STRUCTURE 1	.02							
ALTERNATE 1								
0 XSECTION 1	.02	1.14	6.07	6.55	7.18	7.77	8.31	
ALTERNATE 1								
		7.46	14.44	15.92	17.86	20.35	22.78	

END OF 1 JOBS IN THIS RUN



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 1 OF 12

REV. NO. 0

1

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

JOB	TR-20	FULLPRINT	SUMMARY	NO PLOTS			
TITLE	001	RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2					
TITLE	2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS						
3	STRUCT	01					
8		5.0	0.0	0.0			
8		6.0	0.000001	0.23			
8		6.5	0.75	0.44			
8		6.75	1.30	0.54			
8		7.0	1.68	0.64			
8		7.5	2.26	0.79			
8		8.0	2.71	0.94			
8		8.25	6.21	1.05			
8		8.50	9.52	1.16			
8		9.0	10.34	1.38			
8		10.0	11.80	1.87			
8		10.25	15.64	2.01			
8		10.50	22.37	2.15			
8		11.0	41.10	2.42			
8		12.0	93.48	3.03			
9	ENDTBL						
6	RUNOFF	1 001	4 0.0184	94.	0.286	1 1	1 1
6	RESVOR	2 01 4	5 6.0			1 1 1 1	1
	ENDATA						
7	INCRIN	6	0.1				
7	COMPUT	7 001	01 0.0	1.98	1.0	1 2	01 02
	ENDCMP	1					
7	COMPUT	7 001	01 0.0	3.34	1.0	1 2	01 10
	ENDCMP	1					
7	COMPUT	7 001	01 0.0	3.63	1.0	1 2	01 15
	ENDCMP	1					
7	COMPUT	7 001	01 0.0	4.01	1.0	1 2	01 25
	ENDCMP	1					
7	COMPUT	7 001	01 0.0	4.50	1.0	1 2	01 50
	ENDCMP	1					
7	COMPUT	7 001	01 0.0	4.98	1.0	1 2	01 99
	ENDCMP	1					
	ENDJOB	2					

\*\*\*\*\*END OF 80-80 LIST\*\*\*\*\*



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 2 OF 12

REV. NO. 0

1

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 1
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 1

EXECUTIVE CONTROL OPERATION INCREM MAIN TIME INCREMENT = .10 HOURS RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO STRUCTURE 1 RECORD ID

STARTING TIME = .00 RAIN DEPTH = 1.98 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 AMT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1
OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

Table with columns: TIME (HRS), DISCHG, FIRST HYDROGRAPH POINT, PEAK DISCHARGE (CFS), PEAK ELEVATION (FEET), TIME INCREMENT, DRAINAGE AREA. Contains 24 rows of hydrograph data.

RUNOFF VOLUME ABOVE BASEFLOW = 1.38 WATERSHED INCHES, 16.35 CFS-HRS, 1.35 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1
INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5
SURFACE ELEVATION = 6.00

PEAK TIME (HRS) 10.87 PEAK DISCHARGE (CFS) 1.80 PEAK ELEVATION (FEET) 7.11

1

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 1
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 2

Table with columns: TIME (HRS), DISCHG, ELEV, FIRST HYDROGRAPH POINT, PEAK DISCHARGE (CFS), PEAK ELEVATION (FEET), TIME INCREMENT, DRAINAGE AREA. Contains 11 rows of hydrograph data.



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 3 OF 12

REV. NO. 0

10.00	ELEV	6.69	6.81	6.91	6.97	7.02	7.05	7.08	7.10	7.11	7.11
11.00	DISCHG	1.80	1.80	1.79	1.78	1.76	1.75	1.73	1.72	1.70	1.68
11.00	ELEV	7.10	7.10	7.09	7.08	7.07	7.06	7.05	7.03	7.02	7.00
12.00	DISCHG	1.67	1.65	1.63	1.61	1.59	1.58	1.56	1.54	1.52	1.50
12.00	ELEV	6.99	6.98	6.97	6.96	6.94	6.93	6.92	6.91	6.90	6.88
13.00	DISCHG	1.49	1.47	1.45	1.43	1.41	1.40	1.38	1.36	1.34	1.33
13.00	ELEV	6.87	6.86	6.85	6.84	6.83	6.81	6.80	6.79	6.78	6.77
14.00	DISCHG	1.31	1.29	1.27	1.24	1.22	1.20	1.18	1.16	1.13	1.11
14.00	ELEV	6.76	6.75	6.73	6.72	6.71	6.70	6.69	6.68	6.67	6.67
15.00	DISCHG	1.10	1.08	1.06	1.04	1.03	1.01	1.00	.98	.97	.95
15.00	ELEV	6.66	6.65	6.64	6.63	6.63	6.62	6.61	6.61	6.60	6.59
16.00	DISCHG	.94	.93	.91	.90	.89	.87	.86	.85	.84	.83
16.00	ELEV	6.59	6.58	6.57	6.57	6.56	6.56	6.55	6.55	6.54	6.53
17.00	DISCHG	.81	.80	.79	.78	.77	.76	.75	.75	.74	.73
17.00	ELEV	6.53	6.52	6.52	6.51	6.51	6.51	6.50	6.50	6.49	6.49
18.00	DISCHG	.73	.72	.72	.71	.70	.70	.69	.68	.68	.67
18.00	ELEV	6.49	6.48	6.48	6.47	6.47	6.46	6.46	6.46	6.45	6.45
19.00	DISCHG	.67	.66	.66	.66	.65	.65	.64	.64	.63	.62
19.00	ELEV	6.45	6.44	6.44	6.44	6.43	6.43	6.43	6.42	6.42	6.42
20.00	DISCHG	.62	.61	.61	.60	.60	.59	.59	.58	.58	.58
20.00	ELEV	6.41	6.41	6.41	6.40	6.40	6.40	6.39	6.39	6.39	6.38
21.00	DISCHG	.57	.57	.56	.56	.56	.55	.55	.55	.54	.54
21.00	ELEV	6.38	6.38	6.38	6.37	6.37	6.37	6.37	6.36	6.36	6.36
22.00	DISCHG	.53	.53	.53	.52	.52	.51	.51	.51	.50	.50
22.00	ELEV	6.36	6.35	6.35	6.35	6.35	6.34	6.34	6.34	6.34	6.33
23.00	DISCHG	.50	.50	.49	.49	.49	.48	.48	.48	.48	.47
23.00	ELEV	6.33	6.33	6.33	6.33	6.32	6.32	6.32	6.32	6.32	6.31
24.00	DISCHG	.47	.46	.46	.45	.44	.42	.41	.40	.39	.38
24.00	ELEV	6.31	6.31	6.31	6.30	6.29	6.28	6.28	6.27	6.26	6.25
25.00	DISCHG	.37	.36	.35	.34	.33	.32	.31	.30	.29	.28
25.00	ELEV	6.24	6.24	6.23	6.22	6.22	6.21	6.20	6.20	6.19	6.19
26.00	DISCHG	.27	.27	.26	.25	.24	.24	.23	.22	.22	.21
26.00	ELEV	6.18	6.18	6.17	6.17	6.16	6.16	6.15	6.15	6.14	6.14
27.00	DISCHG	.20	.20	.19	.19	.18	.18	.17	.17	.16	.16

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 1  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 3

27.00	ELEV	6.14	6.13	6.13	6.12	6.12	6.12	6.11	6.11	6.11	6.10
28.00	DISCHG	.15	.15	.14	.14	.13	.13	.13	.12	.12	.12
28.00	ELEV	6.10	6.10	6.10	6.09	6.09	6.09	6.08	6.08	6.08	6.08
29.00	DISCHG	.11	.11	.11	.10	.10	.10	.09	.09	.09	.09
29.00	ELEV	6.08	6.07	6.07	6.07	6.07	6.06	6.06	6.06	6.06	6.06

RUNOFF VOLUME ABOVE BASEFLOW = 1.35 WATERSHED INCHES, 16.05 CFS-HRS, 1.33 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID  
 COMPUTATIONS COMPLETED FOR PASS 1

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 2  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 4

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 RECORD ID  
 TO STRUCTURE 1  
 STARTING TIME = .00 RAIN DEPTH = 3.34 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2  
 ALTERNATE NO. = 1 STORM NO. = 10 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4  
 AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
 INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

TIME (HRS)	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
2.00	10.00	14.44	(RUNOFF)
2.00	DISCHG	.00	.00
3.00	DISCHG	.09	.11
4.00	DISCHG	.24	.25
5.00	DISCHG	.38	.39

FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ. MI.



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 4 OF 12

REV. NO. 0

6.00	DISCHG	.56	.57	.59	.60	.61	.62	.64	.68	.72	.74
7.00	DISCHG	.76	.78	.83	.87	.89	.91	.94	.99	1.03	1.06
8.00	DISCHG	1.07	1.12	1.24	1.33	1.38	1.41	1.51	1.74	1.93	2.03
9.00	DISCHG	2.09	2.23	2.58	2.87	3.01	3.11	4.50	8.48	11.93	13.59
10.00	DISCHG	14.44	13.65	10.17	7.23	5.95	5.39	4.93	4.12	3.50	3.23
11.00	DISCHG	3.12	2.99	2.70	2.48	2.38	2.34	2.29	2.18	2.09	2.05
12.00	DISCHG	2.04	2.00	1.92	1.85	1.83	1.81	1.79	1.74	1.69	1.67
13.00	DISCHG	1.67	1.64	1.59	1.54	1.53	1.52	1.50	1.44	1.40	1.38
14.00	DISCHG	1.37	1.36	1.33	1.31	1.30	1.29	1.28	1.25	1.23	1.22
15.00	DISCHG	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.18	1.16	1.15
16.00	DISCHG	1.15	1.14	1.11	1.09	1.08	1.07	1.06	1.03	1.01	1.00
17.00	DISCHG	1.00	.99	.99	.99	.99	.99	.98	.96	.93	.93
18.00	DISCHG	.92	.91	.88	.86	.85	.85	.85	.88	.90	.91
19.00	DISCHG	.92	.91	.88	.86	.85	.85	.84	.81	.78	.77
20.00	DISCHG	.77	.77	.77	.77	.77	.77	.77	.77	.77	.77
21.00	DISCHG	.77	.77	.77	.77	.77	.77	.76	.73	.71	.70
22.00	DISCHG	.70	.69	.69	.69	.69	.69	.69	.69	.69	.69
23.00	DISCHG	.69	.69	.69	.69	.69	.69	.68	.66	.63	.62
24.00	DISCHG	.62	.54	.32	.14	.06	.02	.01	.00		

RUNOFF VOLUME ABOVE BASEFLOW = 2.68 WATERSHED INCHES, 31.81 CFS-HRS, 2.63 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1  
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5  
SURFACE ELEVATION= 6.00

PEAK TIME(HRS) 10.44 PEAK DISCHARGE(CFS) 5.79 PEAK ELEVATION(FEET) 8.22

TIME(HRS) 1 FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ.MI.

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 2  
REV PC 09/83(.2) 2-. 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 5

2.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
2.00	ELEV	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	6.00
3.00	DISCHG	.01	.01	.01	.02	.02	.02	.03	.03	.04	.04
3.00	ELEV	6.01	6.01	6.01	6.01	6.01	6.02	6.02	6.02	6.03	6.03
4.00	DISCHG	.05	.05	.06	.07	.07	.08	.08	.09	.10	.11
4.00	ELEV	6.03	6.04	6.04	6.04	6.05	6.05	6.06	6.06	6.07	6.07
5.00	DISCHG	.11	.12	.13	.14	.15	.16	.17	.18	.19	.20
5.00	ELEV	6.08	6.08	6.09	6.09	6.10	6.10	6.11	6.12	6.12	6.13
6.00	DISCHG	.21	.22	.23	.24	.25	.26	.27	.28	.29	.31
6.00	ELEV	6.14	6.14	6.15	6.16	6.17	6.17	6.18	6.19	6.20	6.20
7.00	DISCHG	.32	.33	.35	.36	.38	.39	.41	.42	.44	.46
7.00	ELEV	6.21	6.22	6.23	6.24	6.25	6.26	6.27	6.28	6.29	6.30
8.00	DISCHG	.47	.49	.51	.54	.56	.58	.61	.64	.67	.71
8.00	ELEV	6.32	6.33	6.34	6.36	6.37	6.39	6.41	6.43	6.45	6.47
9.00	DISCHG	.75	.81	.88	.97	1.05	1.14	1.26	1.43	1.71	2.05
9.00	ELEV	6.50	6.53	6.56	6.60	6.64	6.68	6.73	6.84	7.02	7.32
10.00	DISCHG	2.39	2.68	4.55	5.52	5.76	5.74	5.61	5.36	5.00	4.62
10.00	ELEV	7.65	7.96	8.13	8.20	8.22	8.22	8.21	8.19	8.16	8.14
11.00	DISCHG	4.28	4.00	3.73	3.46	3.22	3.02	2.86	2.71	2.70	2.68
11.00	ELEV	8.11	8.09	8.07	8.05	8.04	8.02	8.01	8.00	7.98	7.97
12.00	DISCHG	2.67	2.65	2.63	2.61	2.60	2.58	2.56	2.54	2.52	2.50
12.00	ELEV	7.95	7.93	7.91	7.89	7.87	7.85	7.83	7.81	7.79	7.76
13.00	DISCHG	2.48	2.46	2.44	2.42	2.39	2.37	2.35	2.33	2.31	2.28
13.00	ELEV	7.74	7.72	7.70	7.67	7.65	7.62	7.60	7.58	7.55	7.53
14.00	DISCHG	2.26	2.23	2.21	2.18	2.15	2.12	2.10	2.07	2.05	2.02
14.00	ELEV	7.50	7.48	7.45	7.43	7.41	7.38	7.36	7.34	7.32	7.29
15.00	DISCHG	1.99	1.97	1.95	1.92	1.90	1.88	1.86	1.84	1.82	1.80
15.00	ELEV	7.27	7.25	7.23	7.21	7.19	7.17	7.15	7.14	7.12	7.10
16.00	DISCHG	1.78	1.76	1.74	1.72	1.70	1.68	1.66	1.64	1.62	1.60
16.00	ELEV	7.08	7.07	7.05	7.03	7.01	7.00	6.99	6.97	6.96	6.95
17.00	DISCHG	1.58	1.56	1.55	1.53	1.51	1.50	1.48	1.47	1.45	1.43
17.00	ELEV	6.94	6.92	6.91	6.90	6.89	6.88	6.87	6.86	6.85	6.84
18.00	DISCHG	1.42	1.40	1.39	1.37	1.35	1.34	1.32	1.31	1.29	1.28
18.00	ELEV	6.83	6.82	6.81	6.80	6.79	6.78	6.77	6.76	6.75	6.74
19.00	DISCHG	1.26	1.25	1.23	1.21	1.20	1.18	1.17	1.15	1.14	1.12
19.00	ELEV	6.73	6.73	6.72	6.71	6.70	6.70	6.69	6.68	6.68	6.67
20.00	DISCHG	1.11	1.09	1.08	1.06	1.05	1.04	1.02	1.01	1.00	.99
20.00	ELEV	6.66	6.65	6.65	6.64	6.64	6.63	6.62	6.62	6.61	6.61
21.00	DISCHG	.98	.97	.96	.95	.95	.94	.93	.92	.91	.90
21.00	ELEV	6.61	6.60	6.60	6.59	6.59	6.59	6.58	6.58	6.57	6.57
22.00	DISCHG	.90	.89	.88	.87	.86	.85	.85	.84	.83	.83
22.00	ELEV	6.57	6.56	6.56	6.55	6.55	6.55	6.54	6.54	6.54	6.54
23.00	DISCHG	.82	.82	.81	.80	.80	.80	.79	.79	.78	.77
23.00	ELEV	6.53	6.53	6.53	6.52	6.52	6.52	6.52	6.52	6.51	6.51
24.00	DISCHG	.77	.76	.75	.73	.71	.69	.67	.65	.63	.62
24.00	ELEV	6.51	6.50	6.50	6.49	6.47	6.46	6.45	6.44	6.42	6.41



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 5 OF 12

REV. NO. 0

25.00	DISCHG	.60	.58	.56	.55	.53	.52	.50	.49	.47	.46
25.00	ELEV	6.40	6.39	6.38	6.36	6.35	6.34	6.33	6.32	6.31	6.31
26.00	DISCHG	.45	.43	.42	.41	.40	.38	.37	.36	.35	.34

TR20 XEQ 06-12-01 15:12 RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 2  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 6

26.00	ELEV	6.30	6.29	6.28	6.27	6.26	6.26	6.25	6.24	6.23	6.23
27.00	DISCHG	.33	.32	.31	.30	.29	.29	.28	.27	.26	.25
27.00	ELEV	6.22	6.21	6.21	6.20	6.20	6.19	6.19	6.18	6.17	6.17
28.00	DISCHG	.25	.24	.23	.23	.22	.21	.21	.20	.19	.19
28.00	ELEV	6.16	6.16	6.15	6.15	6.15	6.14	6.14	6.13	6.13	6.13
29.00	DISCHG	.18	.18	.17	.17	.16	.16	.15	.15	.14	.14
29.00	ELEV	6.12	6.12	6.12	6.11	6.11	6.11	6.10	6.10	6.10	6.09

RUNOFF VOLUME ABOVE BASEFLOW = 2.64 WATERSHED INCHES, 31.30 CFS-HRS, 2.59 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID  
 COMPUTATIONS COMPLETED FOR PASS 2

TR20 XEQ 06-12-01 15:12 RCBC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 3  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 7

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO STRUCTURE 1 RECORD ID  
 STARTING TIME = .00 RAIN DEPTH = 3.63 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2  
 ALTEGRATE NO. = 1 STORM NO. = 15 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1  
 OUTPUT HYDROGRAPH = 4  
 AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
 INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

TIME (HRS)	DISCHG	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)	(RUNOFF)	DRAINAGE AREA =
2.00	.00	10.00	15.92			.02 SQ.MI.
3.00	.13					
4.00	.29					
5.00	.45					
6.00	.65					
7.00	.87					
8.00	1.22					
9.00	2.34					
10.00	15.92					
11.00	3.42					
12.00	2.23					
13.00	1.82					
14.00	1.50					
15.00	1.33					
16.00	1.25					
17.00	1.09					
18.00	1.01					
19.00	1.00					
20.00	.84					
21.00	.84					
22.00	.76					
23.00	.76					
24.00	.67					

RUNOFF VOLUME ABOVE BASEFLOW = 2.96 WATERSHED INCHES, 35.16 CFS-HRS, 2.91 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1  
 INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5  
 SURFACE ELEVATION = 6.00  
 PEAK TIME (HRS) 10.35 PEAK DISCHARGE (CFS) 7.34 PEAK ELEVATION (FEET) 8.34



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 6 OF 12

REV. NO. 0

TIME (HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ. MI.

1

Table with columns: TR20 XEQ, DATE, TIME, REV, ANALYSIS CASE, STORMS, JOB, PASS, PAGE. Contains hydrograph data for DISCHG and ELEV from 2.00 to 26.00 hours.

1

Table with columns: TR20 XEQ, DATE, TIME, REV, ANALYSIS CASE, STORMS, JOB, PASS, PAGE. Contains hydrograph data for ELEV from 26.00 to 29.00 hours.

1

RUNOFF VOLUME ABOVE BASEFLOW = 2.92 WATERSHED INCHES, 34.65 CPS-HRS, 2.86 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 3 RECORD ID

1



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 7 OF 12

REV. NO. 0

TR20 XEQ 06-12-01 15:12
REV PC 09/83(1.2)

RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 4
PAGE 10

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO STRUCTURE 1

STARTING TIME = .00 RAIN DEPTH = 4.01 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 25 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

Table with columns: TIME (HRS), DISCHG, PEAK DISCHARGE (CFS), PEAK ELEVATION (FEET), FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Contains 24 rows of data.

RUNOFF VOLUME ABOVE BASEFLOW = 3.33 WATERSHED INCHES, 39.57 CFS-HRS, 3.27 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1

INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5
SURFACE ELEVATION = 6.00

PEAK TIME (HRS) 10.31 PEAK DISCHARGE (CFS) 9.29 PEAK ELEVATION (FEET) 6.48

TIME (HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ. MI.

TR20 XEQ 06-12-01 15:12
REV PC 09/83(1.2)

RCRC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 4
PAGE 11

Table with columns: TIME (HRS), DISCHG, ELEV. Contains 11 rows of data for different time intervals.



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 8 OF 12

REV. NO. 0

11.00	ELEV	8.21	8.18	8.15	8.12	8.10	8.08	8.06	8.05	8.04	8.02
12.00	DISCHG	2.92	2.81	2.71	2.70	2.69	2.68	2.67	2.65	2.64	2.62
12.00	ELEV	8.01	8.01	8.00	7.99	7.98	7.96	7.95	7.94	7.92	7.90
13.00	DISCHG	2.61	2.60	2.58	2.56	2.55	2.53	2.51	2.49	2.48	2.46
13.00	ELEV	7.89	7.87	7.86	7.84	7.82	7.80	7.78	7.76	7.74	7.72
14.00	DISCHG	2.44	2.42	2.40	2.38	2.36	2.34	2.32	2.30	2.28	2.26
14.00	ELEV	7.70	7.68	7.65	7.63	7.61	7.59	7.57	7.55	7.53	7.50
15.00	DISCHG	2.24	2.22	2.19	2.17	2.15	2.13	2.11	2.09	2.07	2.04
15.00	ELEV	7.48	7.46	7.44	7.42	7.40	7.39	7.37	7.35	7.33	7.31
16.00	DISCHG	2.02	2.00	1.98	1.96	1.94	1.92	1.90	1.88	1.86	1.84
16.00	ELEV	7.30	7.28	7.26	7.24	7.23	7.21	7.19	7.17	7.16	7.14
17.00	DISCHG	1.82	1.80	1.78	1.77	1.75	1.73	1.71	1.70	1.68	1.66
17.00	ELEV	7.12	7.11	7.09	7.07	7.06	7.04	7.03	7.02	7.00	6.99
18.00	DISCHG	1.65	1.63	1.61	1.60	1.58	1.56	1.54	1.53	1.52	1.50
18.00	ELEV	6.98	6.97	6.96	6.94	6.93	6.92	6.91	6.90	6.89	6.88
19.00	DISCHG	1.49	1.48	1.47	1.45	1.44	1.43	1.42	1.40	1.39	1.38
19.00	ELEV	6.88	6.87	6.86	6.85	6.84	6.83	6.83	6.82	6.81	6.80
20.00	DISCHG	1.36	1.35	1.34	1.32	1.31	1.30	1.28	1.27	1.25	1.24
20.00	ELEV	6.79	6.78	6.77	6.77	6.76	6.75	6.74	6.73	6.73	6.72
21.00	DISCHG	1.22	1.21	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.12
21.00	ELEV	6.72	6.71	6.70	6.70	6.69	6.69	6.68	6.68	6.67	6.67
22.00	DISCHG	1.11	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.02	1.02
22.00	ELEV	6.66	6.66	6.65	6.65	6.64	6.64	6.63	6.63	6.62	6.62
23.00	DISCHG	1.01	1.00	.99	.99	.98	.98	.97	.96	.95	.94
23.00	ELEV	6.62	6.61	6.61	6.61	6.60	6.60	6.60	6.60	6.59	6.59
24.00	DISCHG	.94	.92	.91	.88	.85	.81	.77	.74	.72	.70
24.00	ELEV	6.58	6.58	6.57	6.56	6.54	6.53	6.51	6.50	6.48	6.47
25.00	DISCHG	.68	.66	.64	.62	.61	.59	.57	.55	.54	.52
25.00	ELEV	6.45	6.44	6.43	6.42	6.40	6.39	6.38	6.37	6.36	6.35
26.00	DISCHG	.51	.49	.48	.46	.45	.44	.42	.41	.40	.39

TR20 XEQ 06-12-01 15:12 RCCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 4  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 12

26.00	ELEV	6.34	6.33	6.32	6.31	6.30	6.29	6.28	6.27	6.27	6.26
27.00	DISCHG	.38	.37	.36	.35	.34	.33	.32	.31	.30	.29
27.00	ELEV	6.25	6.24	6.24	6.23	6.22	6.22	6.21	6.20	6.20	6.19
28.00	DISCHG	.28	.27	.26	.26	.25	.24	.24	.23	.22	.22
28.00	ELEV	6.19	6.18	6.18	6.17	6.17	6.16	6.16	6.15	6.15	6.14
29.00	DISCHG	.21	.20	.20	.19	.19	.18	.18	.17	.17	.16
29.00	ELEV	6.14	6.14	6.13	6.13	6.12	6.12	6.12	6.11	6.11	6.11

RUNOFF VOLUME ABOVE BASEFLOW = 3.29 WATERSHED INCHES, 39.02 CFS-HRS. 3.22 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 4 RECORD ID

TR20 XEQ 06-12-01 15:12 RCCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 5  
 REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 13

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO STRUCTURE 1 RECORD ID

STARTING TIME = .00 RAIN DEPTH = 4.50 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2  
 ALTERNATE NO. = 1 STORM NO. = 50 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1  
 OUTPUT HYDROGRAPH = 4  
 AREA = .02 SQ MI INPUT RUNOFF CURVE = 94. TIME OF CONCENTRATION = .29 HOURS  
 INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

TIME (HRS)	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET) (RUNOFF)
1.00	.00	.00	.00
2.00	.04	.06	.18
3.00	.27	.31	.38
4.00	.48	.51	.58
5.00	.68	.74	.83
6.00	.94	.97	1.03

FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ. MI.



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 9 OF 12

REV. NO. 0

7.00	DISCHG	1.20	1.24	1.31	1.36	1.40	1.42	1.46	1.53	1.59	1.62
8.00	DISCHG	1.65	1.72	1.88	2.02	2.09	2.13	2.27	2.60	2.88	3.02
9.00	DISCHG	3.09	3.30	3.79	4.20	4.40	4.53	6.51	12.19	17.02	19.27
10.00	DISCHG	20.35	19.15	14.23	10.08	8.28	7.49	6.83	5.71	4.85	4.47
11.00	DISCHG	4.31	4.13	3.74	3.43	3.29	3.23	3.16	3.00	2.88	2.83
12.00	DISCHG	2.80	2.76	2.64	2.55	2.51	2.50	2.46	2.39	2.33	2.30
13.00	DISCHG	2.29	2.26	2.18	2.12	2.10	2.08	2.05	1.98	1.92	1.89
14.00	DISCHG	1.88	1.86	1.82	1.79	1.78	1.77	1.76	1.72	1.69	1.68
15.00	DISCHG	1.67	1.67	1.67	1.67	1.67	1.67	1.66	1.62	1.59	1.57
16.00	DISCHG	1.57	1.55	1.52	1.48	1.47	1.47	1.45	1.41	1.38	1.37
17.00	DISCHG	1.36	1.36	1.36	1.36	1.36	1.36	1.35	1.31	1.28	1.26
18.00	DISCHG	1.26	1.24	1.21	1.17	1.16	1.16	1.17	1.20	1.23	1.25
19.00	DISCHG	1.25	1.24	1.21	1.18	1.16	1.16	1.14	1.10	1.07	1.06
20.00	DISCHG	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
21.00	DISCHG	1.05	1.05	1.05	1.05	1.05	1.05	1.04	1.00	.97	.95
22.00	DISCHG	.95	.95	.94	.94	.94	.94	.94	.94	.94	.94
23.00	DISCHG	.94	.94	.94	.94	.95	.94	.93	.89	.86	.85
24.00	DISCHG	.84	.74	.44	.19	.08	.03	.01	.01	.00	

RUNOFF VOLUME ABOVE BASEFLOW = 3.81 WATERSHED INCHES, 45.29 CFS-HRS, 3.74 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1  
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5  
SURFACE ELEVATION= 6.00

PEAK TIME(HRS) 10.33 PEAK DISCHARGE(CFS) 9.89 PEAK ELEVATION(FEET) 8.72

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2  
REV PC 09/83(1.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 5  
PAGE 14

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .10 HOURS	DRAINAGE AREA = .02 SQ.MI.
2.00	DISCHG .00	.01 .01	.02 .03
2.00	ELEV 5.00	5.00 6.00	6.01 6.02
3.00	DISCHG .04	.05 .06	.06 .07
3.00	ELEV 6.03	6.03 6.04	6.04 6.05
4.00	DISCHG .13	.14 .15	.16 .17
4.00	ELEV 6.08	6.09 6.10	6.11 6.12
5.00	DISCHG .24	.25 .27	.28 .30
5.00	ELEV 6.16	6.17 6.18	6.19 6.20
6.00	DISCHG .39	.40 .42	.44 .45
6.00	ELEV 6.26	6.27 6.28	6.29 6.30
7.00	DISCHG .56	.58 .60	.62 .64
7.00	ELEV 6.37	6.38 6.40	6.41 6.43
8.00	DISCHG .80	.84 .88	.93 .98
8.00	ELEV 6.52	6.54 6.56	6.58 6.61
9.00	DISCHG 1.35	1.41 1.47	1.55 1.64
9.00	ELEV 6.78	6.82 6.86	6.91 6.97
10.00	DISCHG 7.36	9.60 9.81	9.89 9.86
10.00	ELEV 8.34	8.55 8.68	8.72 8.71
11.00	DISCHG 7.40	6.70 6.08	5.50 5.00
11.00	ELEV 8.34	8.29 8.24	8.20 8.16
12.00	DISCHG 3.37	3.24 3.11	2.99 2.88
12.00	ELEV 8.05	8.04 8.03	8.02 8.01
13.00	DISCHG 2.68	2.67 2.66	2.64 2.63
13.00	ELEV 7.96	7.95 7.94	7.93 7.91
14.00	DISCHG 2.54	2.52 2.51	2.49 2.47
14.00	ELEV 7.81	7.79 7.78	7.76 7.74
15.00	DISCHG 2.37	2.35 2.34	2.32 2.30
15.00	ELEV 7.62	7.60 7.58	7.57 7.55
16.00	DISCHG 2.19	2.17 2.15	2.13 2.11
16.00	ELEV 7.44	7.43 7.41	7.39 7.37
17.00	DISCHG 1.99	1.97 1.95	1.93 1.92
17.00	ELEV 7.27	7.25 7.23	7.22 7.20
18.00	DISCHG 1.81	1.79 1.77	1.76 1.74
18.00	ELEV 7.11	7.10 7.08	7.07 7.05
19.00	DISCHG 1.64	1.63 1.62	1.61 1.59
19.00	ELEV 6.98	6.97 6.96	6.95 6.94
20.00	DISCHG 1.51	1.49 1.48	1.47 1.45
20.00	ELEV 6.89	6.88 6.87	6.86 6.85
21.00	DISCHG 1.38	1.37 1.36	1.35 1.34
21.00	ELEV 6.81	6.80 6.79	6.78 6.77
22.00	DISCHG 1.28	1.26 1.25	1.24 1.22
22.00	ELEV 6.74	6.73 6.73	6.72 6.71
23.00	DISCHG 1.16	1.15 1.14	1.13 1.12
23.00	ELEV 6.69	6.68 6.68	6.67 6.67
24.00	DISCHG 1.07	1.05 1.03	1.00 .96
24.00	ELEV 6.64	6.64 6.63	6.61 6.60
25.00	DISCHG .74	.72 .70	.68 .66



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 10 OF 12

REV. NO. 0

1

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 5
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 15

Table with 11 columns of data: ELEV, DISCHG, ELEV, DISCHG, ELEV, DISCHG, ELEV, DISCHG, ELEV, DISCHG, ELEV. Values range from 6.15 to 6.49.

RUNOFF VOLUME ABOVE BASEFLOW = 3.76 WATERSHED INCHES, 44.67 CFS-HRS, 3.69 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
COMPUTATIONS COMPLETED FOR PASS 5

1

TR20 XEQ 06-12-01 15:12 RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2 JOB 1 PASS 6
REV PC 09/83(.2) 2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS PAGE 16

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID

FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 4.98 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ART. MOIST. COND = 2
ALTERNATE NO. = 1 STORM NO. = 99 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1
OUTPUT HYDROGRAPH = 4
AREA = .02 SQ MI INPUT RUNOFF CURVE = 94 TIME OF CONCENTRATION = .29 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT = .0381 HOURS

Table with 11 columns: TIME (HRS), DISCHG, FIRST HYDROGRAPH POINT, TIME INCREMENT, DRAINAGE AREA. Values range from 1.00 to 24.00 hours.

RUNOFF VOLUME ABOVE BASEFLOW = 4.29 WATERSHED INCHES, 50.90 CFS-HRS, 4.21 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 1
INPUT HYDROGRAPH = 4 OUTPUT HYDROGRAPH = 5
SURFACE ELEVATION = 6.00
PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 11 OF 12

REV. NO. 0

10.35 10.34 9.00

1

TR20 XEQ 06-12-01 15:12
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 6
PAGE 17

Table with columns: TIME (HRS), FIRST HYDROGRAPH POINT = .00 HOURS, TIME INCREMENT = .10 HOURS, DRAINAGE AREA = .02 SQ. MI. Rows include DISCHG and ELEV values for various time intervals from 2.00 to 25.00 hours.

1

TR20 XEQ 06-12-01 15:12
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 PASS 6
PAGE 18

Table with columns: TIME (HRS), DISCHG, ELEV. Rows include DISCHG and ELEV values for various time intervals from 25.00 to 29.00 hours.

RUNOFF VOLUME ABOVE BASEFLOW = 4.23 WATERSHED INCHES, 50.26 CFS-HRS, 4.15 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 6

RECORD ID



ATTACHMENT NO. 4

PROJECT Russell City Energy Center

JOB NUMBER 24405

SUBJECT Storm Water Management Basin Sizing, Pre- and Post-Development Runoff

CALC NO H&H-1

SHEET NO 12 OF 12

REV. NO. 0

EXECUTIVE CONTROL OPERATION ENDJOB 1

RECORD ID

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 19

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED  
(A STAR(\*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH  
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

Table with columns: SECTION/STRUCTURE ID, STANDARD CONTROL OPERATION, DRAINAGE AREA (SQ MI), RAIN TABLE #, ANTEC MOIST COND, MAIN TIME INCREM (HR), PRECIPITATION (BEGIN, AMOUNT, DURATION), RUNOFF AMOUNT (IN), PEAK DISCHARGE (ELEVATION, TIME, RATE, RATE). Rows include storm events 2, 10, 15, 25, 50, and 99 with sub-rows for XSECTION and STRUCTURE.

TR20 XEQ 06-12-01 15:12  
REV PC 09/83(.2)

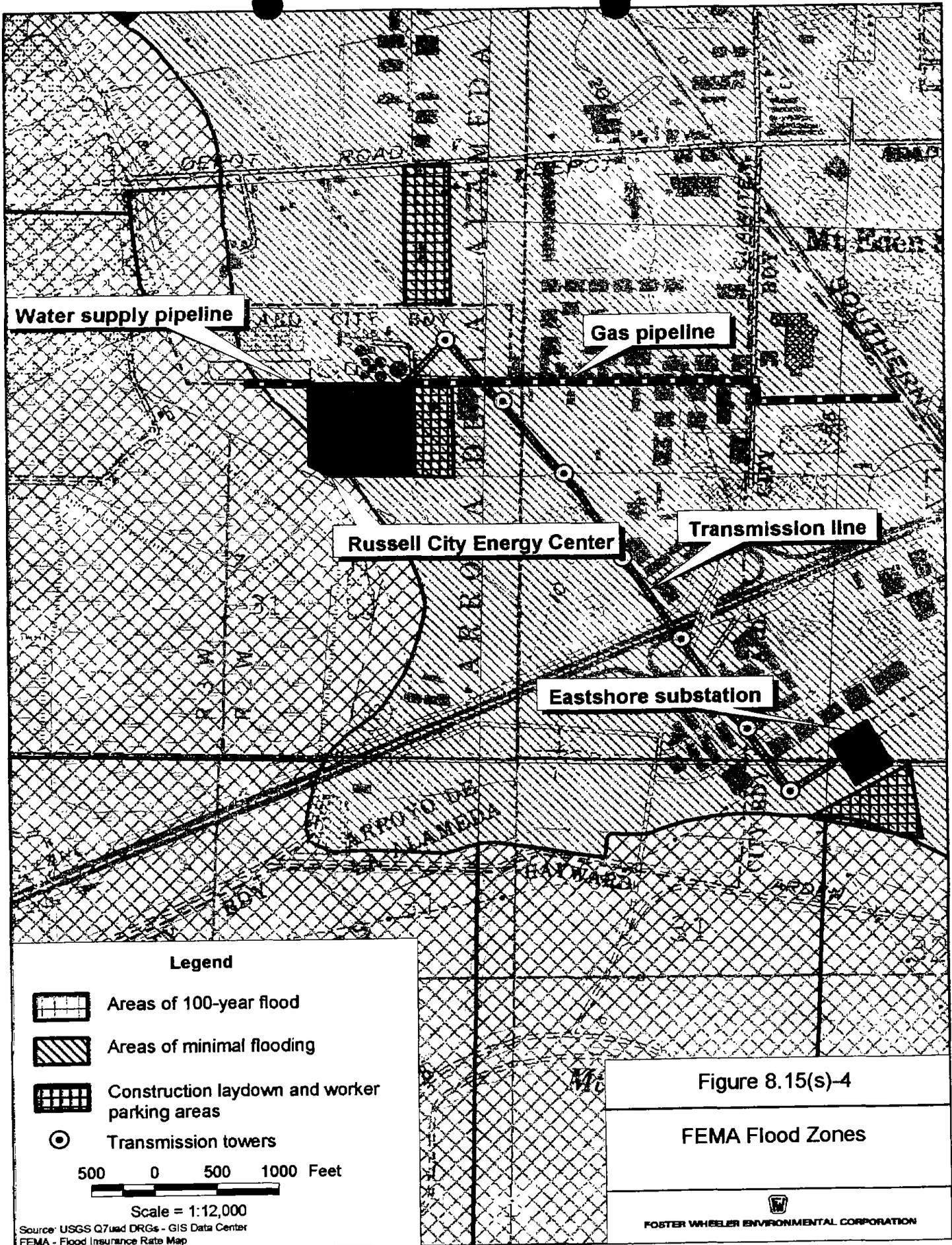
RCEC POST-DEVELOPMENT RUNOFF ANALYSIS, CASE 2  
2-, 10-, 15-, 25-, 50-, & 100-YEAR, 24-HOUR STORMS

JOB 1 SUMMARY  
PAGE 20

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

Table with columns: XSECTION/STRUCTURE ID, DRAINAGE AREA (SQ MI), STORM NUMBERS (2, 10, 15, 25, 50, 99). Rows show discharge values for storm events 2, 10, 15, 25, 50, and 99.

## FEMA FLOOD ZONE MAP



**CITY SANITARY WASTEWATER  
“WILL SERVE” LETTER**

## 8.15 SOIL AND WATER RESOURCES

### **1. Will Serve letters (6-month processes [Appendix B (g)(14)(A)(i), §2022(b)(1)(A)]):**

*Substantial evidence that the project as proposed in the application will comply with all standards, ordinances, and laws applicable at the time of certification including; A list of such standards, ordinances, and laws.*

#### **Information required to make AFC conform with regulations:**

*Please provide LORS information pertaining to the proposed backup water supply from the Union Sanitary District (USD) wastewater treatment plant.*

*The “will serve” letter from the City of Hayward (Appendix 7A) does not indicate whether the City will accept sanitary wastewater. Please provide clarification regarding the aforementioned issue.*

**Response**— See response under Water Resources, Item #10.

### **2. NPDES Permit/backup water supply (6-month processes [Appendix B (g)(14)(A)(i), §2022(b)(1)(B)]):**

*Information demonstrating that the project as proposed in the application will comply with all such standards, ordinances, and laws;*

#### **Information required to make AFC conform with regulations:**

*According to the SFBRWQCB, any effluent discharged beyond the headworks of a waste treatment facility is treated as a separate discharge. Because this will be the case for the RCEC project, the applicant needs to submit a complete Report of Waste Discharge (ROWD) in order for the RWQCB to issue WDRs in the form of an NPDES permit. Please provide a complete ROWD that would enable the RWQCB to initiate the permit review process. Energy Commission staff has requested a letter from the SFBRWQCB regarding the status of an ROWD submission by the Applicant.*

*As per Appendix B (g) (14) (A) (i), the RCEC would be treated as a separate discharge and will be handled by an NPDES permit for wastewater discharge. Provide a discussion on the aforementioned permit regarding applicability and conformance issues.*

*Please provide LORS information pertaining to the proposed backup water supply from the Union Sanitary District (USD) wastewater treatment plant*

**Response**— See responses under Water Resources, Items #1, #2, and #5.

### **3. Changes in LORS (6-month processes [Appendix B (g)(14)(A)(i), §2022(b)(1)(C)]):**

*Where a standard, ordinance, or law is expected to change between the time of filing an application and certification, information from the responsible jurisdiction documenting the impending change, the schedule for enactment of the change, and whether the proposed project will comply with the changed standard, ordinance, or law.*

**Response**—According to Ms. Gayle Tupper, Senior Source Control Inspector, City of Hayward Department of Public Works (510)881-7993, a local limit study is currently being performed to determine

if discharge limits (for discharges to the City's WPCF) need to be amended. There is no information available yet as to whether there will be any changes.

Ms. Tupper is not aware of any regulatory changes that will affect EBDA discharge to the Bay. The current permit is applicable for 5 years, and therefore will not change prior to RCEC operation.

**4. NPDES permit (6-month processes [Appendix B (g)(14)(A)(i), §2022(b)(2)(E)]):**

*If the project will result in a discharge of waste that could affect the water quality of the state, a complete report of proposed waste discharge as required by section 13260 of the Water Code. This will allow for issuance of waste discharge requirements by the appropriate regional water quality control board within 100 days after filing the application in accordance with Public Resources Code section 25550(d);*

**Information required to make AFC conform with regulations:**

*According to the SFBRWQCB, any effluent discharged beyond the headworks of a waste treatment facility is treated as a separate discharge. Because this will be the case for the RCEC project, the applicant needs to submit a complete Report of Waste Discharge (ROWD) in order for the RWQCB to issue WDRs in the form of an NPDES permit. Please provide a complete ROWD that would enable the RWQCB to initiate the permit review process. Energy Commission staff has requested a letter from the SFBRWQCB regarding the status of an ROWD submission by the Applicant.*

*As per Appendix B (g) (14) (A) (i), the RCEC would be treated as a separate discharge and will be handled by an NPDES permit for wastewater discharge. Provide a discussion on the aforementioned permit regarding applicability and conformance issues.*

**Response—** See response under Water Resources, Item #1.

**5. "Will serve letter" (6-month processes [Appendix B (g)(14)(A)(i), §2022(b)(5)(B)]):**

*A will-serve letter or similar document from each provider of water to the project, indicating each provider's willingness to provide water to the project and describing all conditions under which the water will be provided, and a discussion of all other contractual agreements with the applicant pertaining to the provision of water to the project.*

**Information required to make AFC conform with regulations:**

*Provide a "will serve" letter from USD that accepts the Applicants proposal to use their water as backup supply.*

*The "will serve" letter from the City of Hayward (Appendix 7A) does not indicate whether the City will accept sanitary wastewater. Please provide clarification regarding the aforementioned issue.*

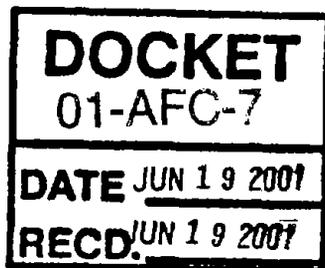
**Response—** See response under Water Resources, Item #10.



Calpine Corporation

June 19, 2001

Mr. Steve Larson  
Executive Director  
California Energy Commission  
1516 Ninth Street  
Sacramento, California 95814



Bechtel Enterprises Holdings, Inc.

**Subject: Russell City Energy Center Supplemental Information (01-AFC-07)**

Dear Mr. Larson:

On May 22, 2001, Calpine Corporation (Calpine) and Bechtel Enterprises Holdings, Inc. (Bechtel) submitted an application for Certification (AFC) for the Russell City Energy Center. Subsequently, the California Energy Commission staff notified Calpine/Bechtel on June 12, 2001 regarding the need to provide supplemental information to ensure that the AFC can be deemed data adequate for both the six-month and 12-month AFC review process.

Calpine/Bechtel staff and its consultants have reviewed the data adequacy worksheets and are including with this transmittal letter supplemental information in the following areas:

- Air Quality (6-month and 12-month data adequacy)
- Cultural (6-month and 12-month data adequacy)
- Noise (12-month data adequacy)
- Socioeconomics/Environmental Justice (12-month data adequacy)
- Soils (6-month data adequacy)
- Visual (6-month and 12-month data adequacy)
- Water (6-month and 12-month data adequacy)

I hereby attest, under penalty of perjury, that the contents of this supplemental information are truthful and accurate to the best of my knowledge.

Dated this 19<sup>th</sup> day of June 2001.

Sincerely,  
RUSSELL CITY ENERGY CENTER

James Leahy  
Development Manager  
Calpine/Bechtel Joint Development

Attachments



**Calpine Corporation**

*Clean Energy for the 21st Century*



**Bechtel Enterprises Holdings, Inc.**

June 19, 2001

Mr. Steve Larson  
Executive Director  
California Energy Commission  
1516 Ninth Street  
Sacramento, California 95814

**Subject: Russell City Energy Center Supplemental Information (01-AFC-07)**

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Calpine/Bechtel staff and its consultants have reviewed the data adequacy worksheets and are including with this transmittal letter supplemental information in the following areas:

Air Quality (6-month and 12-month data adequacy)  
Cultural (6-month and 12-month data adequacy)  
Noise (12-month data adequacy)  
Socioeconomics/Environmental Justice (12-month data adequacy)  
Soils (6-month data adequacy)  
Visual (6-month and 12-month data adequacy)  
Water (6-month and 12-month data adequacy)

I hereby attest, under penalty of perjury, that the contents of this supplemental information are truthful and accurate to the best of my knowledge.

Dated this 19<sup>th</sup> day of June 2001.

Sincerely,  
RUSSELL CITY ENERGY CENTER

James Leahy  
Development Manager  
Calpine/Bechtel Joint Development

**Attachments**

CALPINE/BECHTEL JOINT DEVELOPMENT  
6700 KOLL CENTER PARKWAY, SUITE 200  
PLEASANTON, CALIFORNIA 94566  
925-600-2000 925-600-8926 (fax)

2899 00277

# WORKSHOP NOTICE

RECEIVED  
NOV 19 2001  
SACRAMENTO  
FISH & WILDLIFE COMMISSION

TO: EST  
2001  
Garry T

**DOCKET**  
01-AFC-7  
NOV 16 2001  
**RECD.** NOV 16 2001

## Russell City Energy Center Staff Assessment Workshop

**Purpos** : On October 30, Energy Commission staff issued its Staff Assessment on the Russell City Energy Center (RCEC) Application for Certification (AFC). There will be a series of workshops to discuss the Staff Assessment with the Applicant, Intervenors, governmental agencies and members of the public. Staff will cover the technical topics contained in the Staff Assessment over three days as noted below. Agencies, interested parties, and the public are invited to attend and participate.

Day & Time	Topics	Location
<b>Wednesday, November 28</b>  <b>4:30 – No later than 9:30 PM</b>	Plant Efficiency, Reliability, Facility Design, Geology & Paleontology, Transmission System Engineering, Wastes, Hazardous Materials, Worker Safety and Fire Protection, Socioeconomics, Land Use, Cultural Resources, Traffic, Noise, Soils and Water, Biological Resources, and Alternatives	City Hall Room 2A 777 B Street (corner of B & Watkins Street.) Hayward, California <i>A map is included. Rooms are wheelchair accessible.</i>
<b>Thursday, November 29</b>  <b>4:30 – No later than 9:30 PM</b>	Visual Resources	Centennial Hall Room 7 22292 Foothill Boulevard. (off of City Center Drive) Hayward, California
<b>Tuesday, December 4</b>  <b>4:30 – No later than 9:30 PM</b>	Air Quality, Public Health, Transmission Line Safety	City Hall Room 2A (address above)

The topics will generally be discussed in the order in which they are listed. Except for the first topic of the day, it is not possible to judge at what time the topic discussions will begin or conclude. There will be at least one half-hour break on each day and the session will end when the topics planned are completed, but will not go any later than the stated time. If the topics planned for November 28 are not completed, they may be carried over to November 29 or December 4.

**Project Summary:** Calpine, Bechtel Joint Development proposes to construct and operate a 600-(megawatt) MW, natural gas-fired, combined-cycle power plant. The proposed site is located in the Industrial Corridor of the City of Hayward in Alameda County at the intersection of Enterprise and Whitesell Streets.

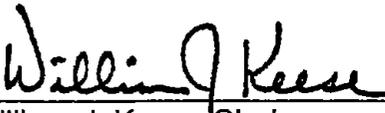


**Public Participation:** For information on how to participate in the Energy Commission's review of the proposed project please contact Roberta Mendonca, the Energy Commission's Public Adviser, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail at PAO@energy.state.ca.us. If you require special accommodations, contact Priscilla Ross, (916) 653-6631 at least five days prior to the workshop.

**Agency Participation:** Energy Commission staff encourages attendance by representatives of agencies that have either direct or indirect interests in the project.

**Questions:** General information on the proposed power plant and the Staff Assessment is available on the Energy Commission's website at <<http://www.energy.ca.gov/sitingcases/russellcity>>. Inquiries about the project schedule or analysis should be directed to Kae Lewis, Energy Commission Project Manager, at (916) 654-4176, or by e-mail at <[klewis@energy.state.ca.us](mailto:klewis@energy.state.ca.us)>. News media inquiries should be directed to Claudia Chandler, Assistant Director, at (916) 654-4989, or e-mail at <[cchandle@energy.state.ca.us](mailto:cchandle@energy.state.ca.us)>.

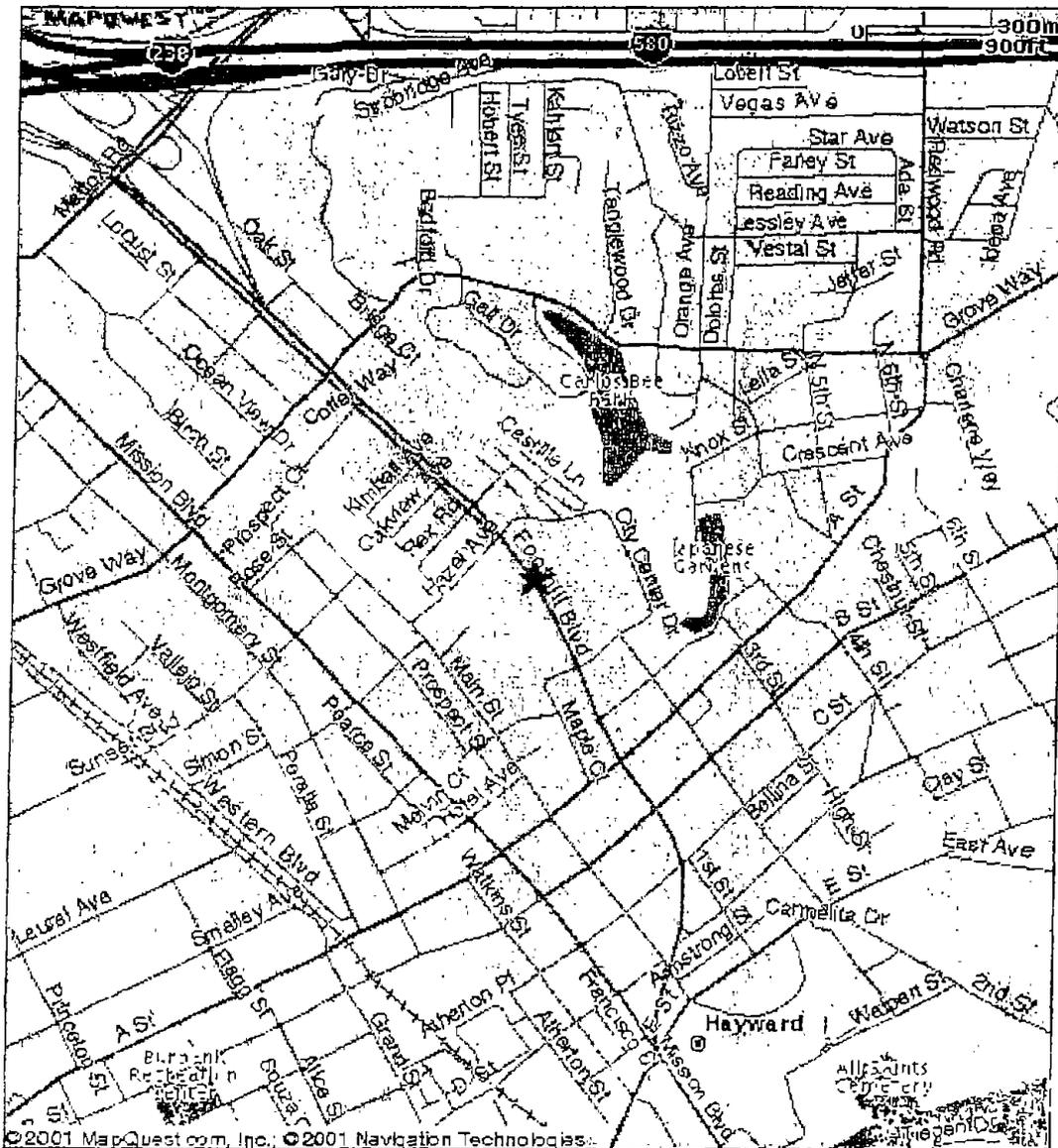
DATE: 11-16-01

  
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William J. Keese Chairman and  
Commissioner and Presiding Member

Mailed to Lists: Russell City POS,  
7078  
7079  
7080



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