# *Kings River Conservation District Peaking Plant*

Application for:

**Small Power Plant Exemption**

Submitted to:

**California Energy Commission**

November 2003

Volume 1 - Text

KRCD

Kings River Conservation District

*Reliable resources for the Valley*

# TABLE OF CONTENTS

**CHAPTER 1.0 EXECUTIVE SUMMARY**

1.1 Introduction ..... 1
1.2 Project Overview ..... 1
1.2.1 Kings River Conservation District ..... 1
1.2.2 Power Purchase Agreement ..... 2
1.2.3 Project Description ..... 2
1.2.4 Project Objectives ..... 5
1.2.5 Project Schedule ..... 5
1.3 Environmental Considerations ..... 5
1.3.1 Air Quality ..... 5
1.3.2 Noise ..... 6
1.3.3 Water Resources ..... 6
1.3.4 Visual Resources ..... 6
1.3.5 Land Use ..... 7
1.3.6 Agriculture and Soils ..... 7
1.3.7 Traffic and Transportation ..... 8
1.3.8 Public Health ..... 8
1.3.9 Worker Health and Safety ..... 9
1.3.10 Hazardous Materials and Waste Management ..... 9
1.3.11 Geologic Resources and Hazards ..... 9
1.3.12 Socioeconomics ..... 10
1.3.13 Cultural Resources ..... 10
1.3.14 Paleontological Resources ..... 10
1.3.15 Biological Resources ..... 11
1.4 Alternatives ..... 11
1.5 List of Preparers ..... 12
1.6 Applicable Laws, Ordinances, Regulations, and Standards ..... 12
1.7 References ..... 13

**CHAPTER 2.0 PROJECT AND FACILITY DESCRIPTION**

2.1 Project Summary ..... 1
2.2 Project Description, Design and Operation ..... 1
2.2.1 Site Layout ..... 1
2.2.2 Process Description ..... 2
2.2.3 Combustion Turbine Generation Equipment ..... 4
2.2.4 Emission Control Equipment ..... 5
2.2.5 Plant Auxiliaries ..... 5
2.2.5.1 Control System ..... 5
2.2.5.2 Lighting ..... 6
2.2.5.3 Grounding ..... 6
2.2.5.4 Cathodic Protection ..... 6
2.2.5.5 Service Air ..... 6
2.2.5.6 Instrument Air ..... 6

2.3 Fuel System ..... 6
2.4 Water Requirements ..... 7
2.4.1 Water Supply System ..... 7
2.4.2 Water Treatment System ..... 8
2.5 Wastewater Systems ..... 8
2.5.1 Sanitary Waste ..... 8
2.5.2 Process Wastewater ..... 9
2.5.2.1 Option 1 – ZLD Reverse Osmosis/Brine Concentrator ..... 9
2.5.2.2 Option 2 – ZLD High Efficiency Reverse Osmosis ..... 9
2.5.2.3 Option 3 – ZLD Off-Site Regeneration ..... 10
2.6 Management of Hazardous Materials ..... 10
2.7 Fire Protection ..... 11
2.8 Electrical Transmission System ..... 12
2.8.1 Transmission Interconnection ..... 12
2.8.2 Applicable LORS ..... 12
2.8.3 Transmission Interconnection Studies ..... 13
2.8.4 Transmission Line Safety and Nuisance ..... 14
2.8.4.1 Electrical Clearances ..... 14
2.8.4.2 Electrical Effects ..... 15
2.8.5 Aviation Safety ..... 16
2.8.6 Fire Hazards ..... 17
2.9 References ..... 17

**CHAPTER 3.0 ENGINEERING AND DESIGN CRITERIA**
3.1 Introduction ..... 1
3.1.1 General Description ..... 1
3.1.2 Codes and Standards ..... 1
3.2 Site Design Data ..... 3
3.3 General Design Criteria ..... 3
3.4 KRCDPP Emissions Design Basis ..... 4
3.4.1 Nitrous Oxide Control ..... 4
3.4.2 Carbon Monoxide and Reactive Organic Compounds Control ..... 4
3.4.3 Continuous Emission Monitoring System ..... 5
3.5 Mechanical Equipment Design ..... 5
3.5.1 Combustion Turbine Generator ..... 6
3.5.1.1 CTG Electrical System ..... 6
3.5.1.2 CTG Inlet Air Filtration/Silencing System ..... 6
3.5.1.3 CTG Inlet Air Chilling and Heating System ..... 7
3.5.1.4 CTG Enclosure ..... 8
3.5.1.5 CTG Fuel Systems and Water Injection System ..... 8
3.5.1.6 CTG Starting System ..... 8
3.5.1.7 CTG Lubricating Oil Systems ..... 8
3.5.1.8 CTG Fire Detection and Protection System ..... 9
3.5.1.9 CTG Controls ..... 9
3.5.1.10 CTG Water Wash System ..... 9
3.5.2 Demineralized Water Treatment System ..... 9

3.5.3 Fuel Gas System ....10
3.5.4 Fire Protection System ....10
3.5.5 Service and Potable Water System ....11
3.5.6 Service and Instrument Air System ....11
3.5.7 Wastewater Treatment System ....11
3.5.8 Heating, Ventilating, and Air-Conditioning Systems ....13
3.6 Piping ....13
3.6.1 Piping Codes and Standards ....13
3.6.2 Piping Material and Design ....13
3.6.3 Piping Insulation ....13
3.6.4 Pipe Supports ....13
3.7 Valves ....14
3.8 Instrumentation and Controls ....14
3.8.1 Control System Design ....14
3.9 Instrumentation ....14
3.10 Control Room ....14
3.11 Electrical ....15
3.11.1 General Design ....15
3.11.2 Auxiliary Electrical Design ....15
3.11.3 Transmission Design ....15
3.11.4 Generator Step-Up Transformers ....16
3.11.5 Auxiliary Transformers ....16
3.11.6 Switchgear 13.8 kV ....16
3.11.7 Switchgear 4.16kV ....16
3.11.8 Station Service Transformers ....17
3.11.9 Grounding System ....17
3.11.10 Cathodic Protection ....17
3.11.11 Direct Current Uninterruptible Power Supply Systems ....17
3.11.12 Paging and Communication System ....18
3.11.13 Lighting ....18
3.11.14 Power Wiring ....19
3.12 Civil Site Work Design ....19
3.12.1 General ....19
3.12.2 Earth Work ....19
3.12.3 Grading Design ....19
3.12.4 Storm Drainage Design ....19
3.12.5 Oily Water ....20
3.12.6 Road and Pavement ....20
3.13 Structure Design ....20
3.13.1 Design Loads ....20

**CHAPTER 4.0 EFFICIENCY AND ENERGY RESOURCES**
4.1 Efficiency Analysis .... 1
4.2 Energy Resources .... 2
4.3 References .... 3

**CHAPTER 5.0 ENVIRONMENTAL CONSIDERATIONS**


**5.1 Air Quality**

5.1.1 Introduction ..... 1
5.1.2 Affected Environment ..... 1
5.1.2.1 Project Site Area ..... 1
5.1.2.2 Sensitive Receptors ..... 3
5.1.2.3 Topography ..... 5
5.1.2.4 Climate and Meteorology ..... 5
5.1.2.5 Ambient Air Quality Standards ..... 6
5.1.2.6 Existing Air Quality ..... 7
5.1.3 Laws, Ordinances, Regulations, and Standards ..... 10
5.1.3.1 Required Permits and Agency Contacts ..... 19
5.1.4 Environmental Consequences ..... 19
5.1.4.1 Environmental Checklist ..... 19
5.1.4.2 Criteria Pollutant Emissions ..... 20
5.1.4.3 Air Quality Impact Assessment ..... 28
5.1.5 Proposed Mitigation Measures ..... 37
5.1.6 Cumulative Impacts ..... 38
5.1.7 References ..... 38

**5.2 Noise**

5.2.1 Introduction ..... 1
5.2.2 Affected Environment ..... 1
5.2.2.1 Fundamentals of Acoustics ..... 1
5.2.3 Project Area Setting ..... 5
5.2.4 Ambient Noise Environment ..... 6
5.2.4.1 Existing Land Uses ..... 6
5.2.4.2 Existing Noise Environment ..... 7
5.2.5 Applicable Laws, Ordinances, Regulations, and Standards ..... 8
5.2.5.1 Federal ..... 8
5.2.5.2 State ..... 9
5.2.5.3 Local ..... 9
5.2.6 Environmental Consequences ..... 11
5.2.6.1 Environmental Checklist ..... 11
5.2.6.2 Determination of a Significant Increase in Noise Levels ..... 12
5.2.6.3 Discussion of Impacts ..... 12
5.2.7 Proposed Mitigation Measures ..... 18
5.2.8 References ..... 18

**5.3 Water Resources**

5.3.1 Introduction ..... 1
5.3.2 Affected Environment ..... 1
5.3.2.1 Regional Water Resources/Hydrologic Setting ..... 2
5.3.2.2 Climate/Precipitation ..... 3
5.3.2.3 Proposed KRCDPP Water Supply and Use ..... 3
5.3.2.4 Flooding ..... 4

5.3.2.5 Wastewater ..... 5
5.3.2.6 Groundwater ..... 5
5.3.2.7 Surface Water ..... 6
5.3.2.8 Water Quality ..... 7
5.3.3 Laws, Ordinances, Regulations, and Standards ..... 8
5.3.3.1 Federal ..... 8
5.3.3.2 State ..... 9
5.3.3.3 Local ..... 10
5.3.3.4 Required Permits and Agency Contacts ..... 11
5.3.4 Environmental Consequences ..... 12
5.3.4.1 Environmental Checklist ..... 12
5.3.5 Impact Assessment ..... 15
5.3.5.1 Potential for Flooding and Storm Water Impacts ..... 15
5.3.5.2 Impacts Associated with Wastewater Discharges ..... 15
5.3.5.3 Impacts on Groundwater Supply ..... 15
5.3.5.4 Impacts on Surface Water Supply ..... 16
5.3.5.5 Water Quality ..... 16
5.3.5.6 Potential for Wind or Water Erosion and Sedimentation ..... 17
5.3.6 Proposed Mitigation Measures ..... 17
5.3.7 Cumulative Impacts ..... 17
5.3.8 References ..... 18

**5.4 Visual Resources**
5.4.1 Introduction ..... 1
5.4.2 Affected Environment ..... 1
5.4.2.1 Regional and Local Setting ..... 1
5.4.2.2 Project Site ..... 2
5.4.2.3 Linear Facilities ..... 3
5.4.2.4 Project Viewshed and Potentially Affected Public Views ..... 4
5.4.3 Laws, Ordinances, Regulations, and Standards ..... 7
5.4.3.1 Federal ..... 7
5.4.3.2 State ..... 7
5.4.3.3 Local ..... 7
5.4.4 Environmental Consequences ..... 13
5.4.4.1 Environmental Checklist ..... 13
5.4.4.2 Impact Assessment ..... 14
5.4.4.3 Visual Characteristics of the KRCDPP ..... 14
5.4.4.4 Visual Simulations ..... 15
5.4.4.5 Visual Impacts ..... 16
5.4.5 Mitigation Measures ..... 19
5.4.6 Cumulative Impacts ..... 19
5.4.7 References ..... 19

**5.5 Land Use**
5.5.1 Introduction ..... 1
5.5.2 Affected Environment ..... 1

5.5.2.1 Regional Setting ..... 1
5.5.2.2 Project Area Setting ..... 1
5.5.2.3 Project Site ..... 2
5.5.2.4 Area Surrounding Project Site ..... 3
5.5.2.5 Electric Transmission ..... 5
5.5.2.6 Natural Gas ..... 5
5.5.2.7 Water and Sewer ..... 5
5.5.2.8 Land Use Trends ..... 6
5.5.2.9 Recreational Facilities and Conservation Plans ..... 7
5.5.3 Laws, Ordinances, Regulations, and Standards ..... 7
5.5.3.1 Federal ..... 7
5.5.3.2 State ..... 7
5.5.3.3 Local ..... 8
5.5.3.4 Required Permits and Agency Contacts ..... 11
5.5.4 Environmental Consequences ..... 12
5.5.4.1 Environmental Checklist ..... 12
5.5.4.2 Impact Assessment ..... 13
5.5.4.3 Land Use Impacts ..... 13
5.5.4.4 Recreational and Conservation Plan Impacts ..... 14
5.5.5 Proposed Mitigation Measures ..... 14
5.5.6 Cumulative Impacts ..... 14
5.5.7 References ..... 14

**5.6 Agriculture and Soils**
5.6.1 Introduction ..... 1
5.6.2 Affected Environment ..... 1
5.6.2.1 Regional Setting ..... 1
5.6.2.2 Soil Types ..... 1
5.6.2.3 Areas of Agricultural Significance/Use ..... 10
5.6.3 Laws, Ordinances, Regulations, Standards ..... 12
5.6.3.1 Federal ..... 12
5.6.3.2 State ..... 13
5.6.3.3 Local ..... 13
5.6.3.4 Required Permits and Agency Contacts ..... 14
5.6.4 Environmental Consequences ..... 14
5.6.4.1 Environmental Checklist ..... 14
5.6.4.2 Impact Assessment ..... 15
5.6.5 Proposed Mitigation Measures ..... 18
5.6.6 Cumulative Impacts ..... 18
5.6.7 References ..... 19

**5.7 Traffic and Transportation**
5.7.1 Introduction ..... 1
5.7.2 Affected Environment ..... 1
5.7.2.1 Regional Setting ..... 1
5.7.2.2 Project Area Setting ..... 4

5.7.2.3 Local Roadways in Project Area ..... 6
5.7.2.4 Level of Service/Traffic Characteristics ..... 7
5.7.3 Laws, Ordinances, Regulations, and Standards ..... 8
5.7.3.1 Required Permits and Agency Contacts ..... 10
5.7.4 Environmental Consequences ..... 11
5.7.4.1 Environmental Checklist ..... 11
5.7.5 Impact Assessment ..... 12
5.7.5.1 Construction Phase ..... 12
5.7.5.2 Operation and Maintenance of the KRCDPP ..... 15
5.7.5.3 Operation and Maintenance of Linear Facilities ..... 17
5.7.6 Proposed Mitigation Measures ..... 18
5.7.6.1 Construction Phase ..... 18
5.7.6.2 Operation Phase ..... 19
5.7.7 Cumulative Impacts ..... 19
5.7.8 References ..... 19

**5.8 Public Health**
5.8.1 Introduction ..... 1
5.8.2 Affected Environment ..... 1
5.8.2.1 Sensitive Receptors ..... 3
5.8.3 Laws, Ordinances, Regulations, and Standards ..... 5
5.8.3.1 Required Permits and Agency Contacts ..... 7
5.8.4 Environmental Consequences ..... 8
5.8.4.1 Environmental Checklist ..... 8
5.8.4.2 Toxic (Non-criteria) Air Emissions ..... 8
5.8.4.3 Criteria Air Emissions ..... 20
5.8.4.4 Hazardous Materials ..... 20
5.8.4.5 Odors ..... 20
5.8.5 Proposed Mitigation Measures ..... 21
5.8.5.1 Toxic Air Emissions ..... 21
5.8.5.2 Criteria Air Emissions ..... 21
5.8.5.3 Hazardous Materials ..... 21
5.8.5.4 Odors ..... 21
5.8.6 Cumulative Impacts ..... 21
5.8.7 References ..... 21

**5.9 Worker Health and Safety**
5.9.1 Introduction ..... 1
5.9.2 Affected Environment ..... 1
5.9.3 Laws, Ordinances, Regulations and Standards ..... 2
5.9.3.1 Required Permits and Agency Contacts ..... 7
5.9.4 Environmental Consequences ..... 8
5.9.4.1 Environmental Checklist ..... 8
5.9.4.2 Impact Assessment ..... 9
5.9.4.3 Construction ..... 11
5.9.4.4 Operation and Maintenance ..... 13

5.9.4.5 Fire Protection ..... 14
5.9.5 Proposed Mitigation Measures ..... 14
5.9.6 Cumulative Impacts ..... 15
5.9.7 References ..... 15

**5.10 Hazardous Materials and Waste Management**
5.10.1 Introduction ..... 1
5.10.2 Affected Environment ..... 1
5.10.2.1 Sensitive Receptors ..... 3
5.10.3 Laws, Ordinances, Regulations, and Standards ..... 5
5.10.3.1 Required Permits and Agency Contacts ..... 7
5.10.4 Environmental Consequences ..... 8
5.10.4.1 Hazardous Materials Inventory – Construction ..... 8
5.10.4.2 Hazardous Materials Inventory – O&M ..... 8
5.10.4.3 Waste Generation Inventory ..... 10
5.10.4.4 Environmental Checklist ..... 12
5.10.4.5 Hazardous Materials – Potential Impacts ..... 14
5.10.4.6 Waste Management – Potential Impacts ..... 19
5.10.5 Proposed Mitigation Measures ..... 20
5.10.6 Cumulative Impacts ..... 21
5.10.7 References ..... 22

**5.11 Geologic Resources and Hazards**
5.11.1 Introduction ..... 1
5.11.2 Affected Environment ..... 1
5.11.2.1 Regional Geology ..... 2
5.11.2.2 Local Geology ..... 3
5.11.2.3 Stratigraphy ..... 3
5.11.2.4 Seismicity ..... 4
5.11.2.5 Groundwater ..... 5
5.11.2.6 Liquefaction ..... 5
5.11.2.7 Dynamic Compaction ..... 6
5.11.2.8 Hydrocompaction ..... 6
5.11.2.9 Subsidence ..... 6
5.11.2.10 Expansive and Highly Erodible Soils ..... 6
5.11.2.11 Landslides ..... 6
5.11.2.12 Tsunamis and Seiches ..... 6
5.11.2.13 Volcanic Hazards ..... 7
5.11.2.14 Geologic Mineral Hazards ..... 7
5.11.2.15 Geologic Resources ..... 7
5.11.3 Laws, Ordinances, Regulations, and Standards ..... 7
5.11.4 Environmental Impacts ..... 8
5.11.4.1 Environmental Checklist ..... 8
5.11.4.2 Required Permits and Schedules ..... 9
5.11.5 Impact Assessment ..... 9
5.11.5.1 Seismicity ..... 9

5.11.5.2 Liquefaction ..... 10
5.11.5.3 Dynamic Compaction ..... 10
5.11.5.4 Hydrocompaction ..... 10
5.11.5.5 Subsidence ..... 10
5.11.5.6 Expansive and Highly Erodible Soils ..... 10
5.11.5.7 Landslides ..... 10
5.11.5.8 Tsunamis and Seiches ..... 11
5.11.5.9 Volcanic Hazards ..... 11
5.11.5.10 Geologic Mineral Hazards/Geologic Resources ..... 11
5.11.6 Mitigation Measures ..... 11
5.11.7 Cumulative Impacts ..... 11
5.11.8 References ..... 11

**5.12 Socioeconomics**
5.12.1 Introduction ..... 1
5.12.2 Affected Environment ..... 1
5.12.2.1 Regional Setting ..... 1
5.12.2.2 Project Area Setting ..... 1
5.12.2.3 Work Force ..... 8
5.12.2.4 Environmental Justice ..... 9
5.12.3 Laws, Ordinances, Regulations, and Standards ..... 10
5.12.3.1 Federal ..... 10
5.12.3.2 State ..... 10
5.12.3.3 Local ..... 10
5.12.4 Environmental Consequences ..... 10
5.12.4.1 Environmental Checklist ..... 10
5.12.4.2 Impact Assessment – Construction and O&M ..... 11
5.12.5 Environmental Justice Impacts ..... 15
5.12.5.1 Income Status and Fiscal Resources ..... 17
5.12.6 Mitigation Measures ..... 18
5.12.7 Cumulative Impacts ..... 18
5.12.8 Referenes ..... 18

**5.13 Cultural Resources**
5.13.1 Introduction ..... 1
5.13.2 Affected Environment ..... 1
5.13.2.1 Project Area Setting ..... 1
5.13.2.2 Native American Prehistory ..... 2
5.13.2.3 Ethnography ..... 6
5.13.2.4 Euro-American History ..... 7
5.13.3 Laws, Ordinances, Regulations, and Standards ..... 8
5.13.3.1 Federal (for reference only) ..... 8
5.13.3.2 State ..... 10
5.13.3.3 Local ..... 13
5.13.3.4 Involved Agencies and Agency Contacts ..... 16
5.13.3.5 Permits Required and Permit Schedule ..... 16

5.13.4 Environmental Consequences ..... 16
5.13.4.1 Environmental Checklist ..... 16
5.13.4.2 Impacts Assessment Methodology ..... 17
5.13.4.3 Records Search and Results ..... 18
5.13.4.4 Field Survey ..... 19
5.13.4.5 Native American Consultation ..... 22
5.13.4.6 Discussion of Impacts ..... 22
5.13.5 Proposed Mitigation Measures ..... 22
5.13.6 Cumulative Impacts ..... 26
5.13.7 References ..... 26

**5.14 Paleontological Resources**
5.14.1 Introduction ..... 1
5.14.2 Affected Environment ..... 2
5.14.2.1 Geological Setting ..... 2
5.14.2.2 Field Survey and Results ..... 5
5.14.3 Laws, Ordinances, Regulations, and Standards ..... 7
5.14.3.1 Federal ..... 8
5.14.3.2 State ..... 8
5.14.3.3 County ..... 9
5.14.3.4 City ..... 9
5.14.3.5 Professional Standards ..... 9
5.14.4 Environmental Consequences ..... 12
5.14.4.1 Environmental Checklist ..... 12
5.14.4.2 Impact Assessment ..... 13
5.14.5 Proposed Mitigation Measures ..... 13
5.14.6 Cumulative Impacts ..... 14
5.14.7 References ..... 14

**5.15 Biological Resources**
5.15.1 Introduction ..... 1
5.15.2 Affected Environment ..... 1
5.15.2.1 Regional Setting ..... 1
5.15.2.2 Project Area Setting ..... 1
5.15.2.3 General Vegetation and Habitats ..... 2
5.15.2.4 Special-Status Plant Species ..... 3
5.15.2.5 Special-Status Wildlife Species ..... 3
5.15.3 Laws, Ordinances, Regulations, and Standards ..... 4
5.15.3.1 Federal ..... 5
5.15.3.2 State ..... 6
5.15.3.3 Local ..... 8
5.15.3.4 Required Permits ..... 8
5.15.4 Environmental Consequences ..... 8
5.15.4.1 Environmental Checklist ..... 8
5.15.4.2 Impact Assessment Methodology ..... 9
5.15.4.3 Field Surveys and Results ..... 11

5.15.4.4 Discussion of Impacts ..... 13
5.15.5 Proposed Mitigation Measures ..... 16
5.15.6 Cumulative Impacts ..... 16
5.15.7 References ..... 16

**CHAPTER 6.0 PROJECT ALTERNATIVES**

6.1 Introduction ..... 1
6.2 No Project Alternative ..... 1
6.3 Development of the Project at On-Site Versus Two Sites ..... 2
6.4 Alternative Site Locations ..... 2
6.4.1 Preliminary Site Evaluation ..... 2
6.4.2 Secondary Site Evaluation ..... 3
6.4.2.1 Environmental Considerations ..... 13
6.4.3 Final Site Selection ..... 16
6.4.4 Preferred Site ..... 16
6.5 Alternative Linear Facilities ..... 16
6.6 Alternative Water Supplies ..... 17
6.6.1 Use of Effluent ..... 17
6.6.2 Surface Water ..... 19
6.6.3 Other Alternative Water Supplies ..... 19
6.7 Alternative Wastewater Discharge Options ..... 19
6.8 Alternative Project Configurations ..... 20
6.8.1 Evaporative Coolers Versus Chillers ..... 20
6.8.2 Dry Cooling (Air Heat Exchanger) Versus Wet Cooling ..... 21
6.9 Alternative Technologies ..... 21
6.10 References ..... 22

**CHAPTER 7.0 LIST OF PREPARERS**

# LIST OF TABLES

Table 1.2-1 Land Use and Location Information

Table 2.2-1 Summary of Major Equipment

Table 2.2-2 Average Expected Performance

Table 2.4-1 Water Balance

Table 2.6-1 Hazardous Materials and Quantities

Table 3-2-1 Site Design Elements

Table 5.1-1 Schools Located Within 2 Miles of the Project Site

Table 5.1-2 Ambient Air Quality Standards

Table 5.1-3 Baseline Air Quality In The Region

Table 5.1-4 Summary of Applicable LORS

Table 5.1-5 Agency Contacts – Air Quality

Table 5.1-6 Required Permits – Air Quality

Table 5.1-7 CEQA Environmental Checklist –Air Quality

Table 5.1-8 Natural Gas Fuel Composition

Table 5.1-9 Summary of Proposed BACT for the CTs

Table 5.1-10 Maximum Hourly Emissions Rates (in lbs/hr) – Steady – State Operation

Table 5.1-11 Average Hourly Emissions Rates (lbs/hr) – Steady-State Operation

Table 5.1-12 Emissions Rates (in lbs/hr) Startup/Shutdown Mode

Table 5.1-13 Emissions Rates - Commissioning Mode

Table 5.1-14 Stack Parameters

Table 5.1-15 Predicted Normalized Concentrations From CTs Under Various Operating Scenarios

Table 5.1-16a Project Impacts – ISCST3 Modeling

Table 5.1-16b Project Impacts – Fumigation Modeling

Table 5.1-17 Total Project Impacts

Table 5.1-18 ERCs Required

Table 5.2-1 Typical A-Weighted Maximum Sound Levels of Common Noise Sources

Table 5.2-2 Acoustical Terminology

Table 5.2-3 Subjective Reaction to Changes in Noise Levels of Similar Sources

Table 5.2-4 Summary of Background Noise Level Measurements

Table 5.2-5 Fresno County Noise Level Criteria

Table 5.2-6 City of Fresno Maximum Allowable Noise Exposure-Stationary Sources

Table 5.2-7 CEQA Environmental Checklist –Noise

Table 5.2-11 Construction Equipment Noise

Table 5.2-8 ENM Input Sound Power Levels

Table 5.2-9 ENM Predicted KRCD Operations Single Point Noise Level Calculations

Table 5.2-10 Comparison of Measured Nighttime Background Noise Levels to Predicted KRCDPP Noise Levels Without Silencers on the Exhaust Stacks

Table 5.2-11 Comparison of Measured Nighttime Background Noise Levels to Predicted KRCDPP Noise Levels With Silencer Packages on the Exhaust Stacks

Table 5.3-1 Summary of Temperature (in °F) and Precipitation (in inches)

Table 5.3-2 Water Quality Data – MCWD Groundwater Well Number 4 After Filtration

Table 5.3-3 Water Resources Permit Schedule

Table 5.3-4 CEQA Environmental Checklist –Water Resources

Table 5.4-1 Applicable County General Plan Policies Pertinent to Visual Quality

Table 5.4-2 Applicable Fresno County Zoning Provisions Pertinent to Visual Quality

Table 5.4-3 Applicable Roosevelt Community Plan Pertinent to Visual Quality Provision

Table 5.4-4 CEQA Environmental Checklist – Visual

Table 5.5-1 Applicable Land Use Policies − County of Fresno

Table 5.5-2 Land Use Agency Contacts

Table 5.5-3 CEQA Environmental Checklist –Land Use and Recreational Resources

Table 5.6.1 Summary of Soil Mapping Unit Properties

Table 5.6-2 Required Permits and Agency Contacts – Agriculture & Soils

Table 5.6.3 CEQA Environmental Checklist – Agriculture and Soils

Table 5.7-1 Current Traffic Characteristics for SR99 2

Table 5.7-2 Descriptions of LOS for Intersections and Roadways 3

Table 5.7-3 General Roadway Classifications and Definitions 7

Table 5.7-4 Traffic Characteristics of Local Roadways and Intersections in the Project Area

Table 5.7-5 Traffic and Transportation LORS

Table 5.7-6 Traffic and Transportation Permit Schedule

Table 5.7-7 Traffic and Transportation Agency Contacts

Table 5.7-8 CEQA Environmental Checklist –Traffic and Transportation

Table 5.8-1 Schools Located Within 2 Miles of the Project Site

Table 5.8-2 Summary of Applicable LORS

Table 5.8-3 Agency Contacts – Public Health

Table 5.8-4 CEQA Environmental Checklist –Public Health

Table 5.8-5 Non-Criteria Emissions from the CTs

Table 5.8-6 Non-Criteria Emissions from the Cooling Towers

Table 5.8-7 Non-Criteria Emissions from the ZLD Evaporative Tower

Table 5.8-8 OEHHA/CARB Health Values for Use in Risk Assessments

Table 5.8-9 OEHHA/CARB Acute Reference Exposure Levels and Target Organs

Table 5.8-10 OEHHA/ARB Chronic Reference Exposure Levels and Target Organs

Table 5.8-11 Individual Acute Hazard Quotients and Total Acute Hazard Index

Table 5.8-12 Individual Chronic Hazard Quotients and Total Chronic Hazard Index

Table 5.9-1 Worker Health and Safety LORS

Table 5.9-2 Health and Safety Permits

Table 5.9-3 Agency Contacts – Worker Health and Safety

Table 5.9-4 Hazard Analysis

Table 5.9-5 Construction Training Programs

Table 5.9-6 O&M Training Programs

Table 5.10-1 Schools Located Within 2 Miles of the Project Site

Table 5.10-2 Summary of Applicable LORS

Table 5.10-3 List of Hazardous Material Agency Contacts

Table 5.10-4 Hazardous Materials Used Onsite – O&M

Table 5.10-5 Waste Generation and Management

Table 5.10-6 CEQA Environmental Checklist – Hazardous Materials and Waste Management

Table 5.10-7 Meteorological Data Used In Emergency Release Modeling

Table 5.10-8 Parameters Used In Calculation Of Evaporation Rates For Emergency Release Modeling

Table 5.10-9 SLAB Model Input Parameters For Emergency Release Modeling

Table 5.10-10 Summary of SLAB Emergency Release Modeling: Distance To Toxic Endpoints

Table 5.11-1 Active and Potential Faults

Table 5.11-2 Geologic Resources and Hazards – LORS

Table 5.11-3 CEQA Environmental Checklist –Geologic Resources and Hazards

Table 5.12-1 Fresno County Projected Populations

Table 5.12-2 County Employment Distribution

Table 5.12-3 Construction Workers by Job Class by Month

Table 5.12. 4 CEQA Environmental Checklist – Socioeconomics

Table 5.12-5 Available Labor by Skill in Fresno County

Table 5.12-6 Race by Census Tract Area and for Fresno County

Table 5.12-7 Average Income Levels and Poverty Status by Census Tract

Table 5.13-1 Agency Contacts

Table 5.13-2 CEQA Environmental Checklist – Cultural Resources

Table 5.14-1 CEQA Environmental Checklist - Paleontological Resources

Table 5.15-1 CEQA Environmental Checklist –Biological Resources

Table 6.4-1 Preliminary Information for Initial Sites Identified

Table 6.4-2 Preliminary Screening of Biological Resources by USGS Quadrangle Map

Table 6.4-3 Summary of Primary Sites Considered

Table 7.0-1 List of Preparers

# LIST OF FIGURES AND MAPS

Figure 1.2-1 Regional Area of the KRCDPP

Figure 1.2-2 KRCD Service Territory

Figure 1.2-3 KRCDPP Project Site and Linear Facilities

Figure 2.2-1 Project Area Map

Figure 2.2-2 Site Layout

Figure 2.2-3 KRCDPP Elevation Drawing

Figure 2.8-1 Transmission Pole

Figure 3.5-1 Water Balance (ZLD Onsite)

Figure 3.5-2 Water Balance (ZLD Offsite)

Figure 3.11-1 KRCDPP One-Line Diagram

Figure 3.11-2 KRCDPP One-Line Diagram

Figure 5.2-1 Noise Measurement and Receiver Locations

Figure 5.2-2 Noise Contours with Stack Silencing Packages

Figure 5.2-3 1/3 octave band noise level measurements –Oregon Power Plant

Figure 5.4-1 Location of Photo Viewpoints

Figure 5.4-2a Visual Character Photos- Views at the Project Site

Figure 5.4-2b Visual Character Photos- Views at the Project Site

Figure 5.4-2c Visual Character Photos- Views from the Northeast

Figure 5.4-2d Visual Character Photos- Views from the Northwest

Figure 5.4-2e Visual Character Photos- Views from the Southwest

Figure 5.4-2f Visual Character Photos- Views from the East

Figure 5.4-2g Visual Character Photos- Views from the Southeast at Malaga

Figure 5.4-2h Visual Character Photos- Views of the Transmission and Substation from North Avenue

Figure 5.4-3 Existing View and Visual Simulation from Chestnut Avenue looking southwest

Figure 5.4-4 Existing View and Visual Simulation from North Avenue near Maple looking southeast

Figure 5.4-5 Existing View and Visual Simulation from Central Canal looking southwest

Figure 5.4-6 Existing View and Visual Simulation from North Avenue looking east

Figure 5.5-1 Land Use Designations in the KRCDPP Project Area

Figure 5.5-2 Zoning Designations in the KCDPP Project Area

Figure 5.5-3 Existing Land Uses and Jurisdictions in the KRCDPP Project Area

Figure 5.6-1 Soil Map of the KRCDPP Project Area

Figure 5.6-2 Farmland in the KRCDPP Project Area

Figure 5.7-1 Major Roads in the KRCDPP Project Area

Figure 5.7-2 Traffic Volumes in the KRCDPP Project Area

Figure 5.11-1 Geologic Resources

Figure 5.11-2 Faults in the KRCDPP Area

Figure 5.11-3 Probabilistic Seismic Hazards Assessment in the KRCDPP Project Area

Figure 5.14-1 – Paleontological Field Survey Results

Figure 5.15-1 Biological Resources

Figure 6.4-1 KRCDPP Alternative Site Locations

# LIST OF APPENDICES


| | |
|---|---|
| Appendix A | List of Landowners in the Project Area |
| Appendix 2.8-1 | Portions of PG&E System Impact Study |
| Appendix 5.1-1 | Air Quality Modeling Data |
| Appendix 5.1-2 | Best Available Control Technology Analysis |
| Appendix 5.1-3 | Operational Emissions |
| Appendix 5.1-4 | Construction Phase Emissions and Impacts |
| Appendix 5.2-1 | Measured Ambient Noise Levels |
| Appendix 5.2-2 | Program Environmental Noise Model Source Rankings |
| Appendix 5.3-1 | Kings River Service Area Annual Groundwater Report |
| Appendix 5.3-2 | "Will-Serve" Letter from Malaga County Water District |
| Appendix 5.3-3 | Draft Construction Storm Water Pollution Prevention Plan |
| Appendix 5.5-1 | Legal Description |
| Appendix 5.5-2 | Phase 1 Environmental Site Assessment and Third-Party Reliance Letter |
| Appendix 5.8-1 | 10-Mile Radius of the KRCDPP |
| Appendix 5.8-2 | Health Risk Assessment Calculations |
| Appendix 5.8-3 | Health Risk Assessment Modeling Results-Partial Output |
| Appendix 5.9-1 | Health and Safety Programs – Draft Outlines |
| Appendix 5.10-1 | Ammonia Emergency Release Modeling |

Appendix 5.12-1 U.S. Census Data

Appendix 5.12-2 Description of Minority Status

Appendix 5.13-1 Correspondence with the Native American Heritage Commission

Appendix 5.13-2 Resume - Archaeologist

Appendix 5.14-1 Resume - Paleontologist

Appendix 5.15-1 California Natural Diversity Database Search for Special-Status Species and Habitats (Malaga 7.5 Minute Quadrangle Map)

Appendix 5.15-2 California Natural Diversity Database Search for Special-Status Species and Habitats (Eight Surrounding 7.5 Minute Quadrangle Maps)

Appendix 5.15-3 U. S. Fish and Wildlife Service Database Search for Federally Endangered and Threatened Species (Malaga 7.5 Minute Quadrangle Map)

Appendix 5.15-4 Special-Status Plants and Wildlife Species with the Potential to Occur in the Project Area

Appendix 5.15-5 Resume - Biologist

# ACRONYMS AND ABBREVIATIONS

**A**

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| AAQS | Ambient Air Quality Standards |
| AASHTO | American Association of State Highway and Transportation Officials |
| AB | Assembly Bill |
| AC | Alternating Current |
| ACHP | Advisory Council on Historic Preservation |
| ACI | American Concrete Institute |
| ADA | Americans With Disabilities Act |
| AFBMA | Anti-Friction Bearing Manufacturers Association |
| AGA | American Gas Association |
| AGC | Automatic Generator Control |
| AGMA | American Gear Manufacturers Association |
| AIRFA | American Indian Religious Freedom Act |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AM | Archaeological Monitor |
| AMCA | Air Movement and Control Association |
| ANSI | American National Standards Institute |
| APCO | Air Pollution Control Officer |
| APE | Area of Potential Effect |
| API | American Petroleum Institute |
| APN | Assessor's Parcel Number |
| AQIA | Air Quality Impact Assessment |
| ARI | Air-Conditioning and Refrigeration Institute |
| ARM | Ambient Ratio Method |
| ARPA | Archaeological Resources Protection Act |
| ASCE | American Society of Civil Engineers |
| ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASNT | American Society for Nondestructive Testing |
| ASTM | American Society for Testing and Materials |
| ATC | Authority to Construct |
| AWS | American Welding Society |

| | |
|---|---|
| AWWA | American Water Works Association |

**B**

| | |
|---|---|
| BACT | Best Available Control Technology |
| BMP | Best Management Practices |

**C**

| | |
|---|---|
| $^{o}$C | Degrees Celsius |
| CAA | Clean Air Act |
| CAAQS | California Ambient Air Quality Standards |
| CAISO | California Independent System Operator |
| CalARP | California Accidental Release Prevention |
| Cal-OSHA | California Occupational Safety and Health Administration |
| Caltrans | California Department of Transportation |
| CARB | California Air Resources Board |
| CBC | California Building Code |
| CCR | California Code of Regulations |
| CCTS | Central California Taxonomic System |
| CDF | California Department of Forestry and Fire Protection |
| CDFG | California Department of Fish and Game |
| CDWR | California Department of Water Resources |
| CE | California Endangered |
| CEC | California Energy Commission |
| CEDD | California Employment Development Department |
| CEMS | Continuous Emission Monitoring System |
| CEQA | California Environmental Quality Act |
| CERCLA | Comprehensive Environmental Response, Compensation and Liabilities Act |
| CESA | California Endangered Species Act |
| CFC | Chlorofluorocarbon |
| CFR | Code of Federal Regulations |
| CHP | California Highway Patrol |
| CHRIS | California Historical Resources Information System |
| CL | Clay |
| CMAA | Crane Manufacturers Association of America |
| CNDDB | California Natural Diversity Database |
| CNEL | Community Noise Equivalent Level |
| CNPS | California Native Plant Society |
| CO | Carbon Monoxide |

| | |
|---|---|
| CO2 | Carbon Dioxide |
| Corps | U.S. Army Corps of Engineers |
| CPA or Authority | California Power Authority |
| CPUC | California Public Utilities Commission |
| CR | California Rare |
| CRHR | California Register of Historic Resources |
| CRSI | Concrete Reinforcing Steel Institute |
| CSC | California Species of Special Concern |
| CT | California Threatened |
| CT | Combustion Turbine |
| CTG | Combustion Turbine Generator |
| CTI | Cooling Tower Institute |
| CVRWQCB | Central Valley Regional Water Quality Control Board |
| CWA | Clean Water Act |

**D**

| | |
|---|---|
| $/ton | Dollars Per Ton |
| °F | Degrees in Fahrenheit |
| DAS | Data Acquisition System |
| dB | Decibels |
| dBA | Decibels "A" Scale |
| DBCP | Dibromochloropropane |
| DC | Direct Current |
| DEM | Digital Elevation Model |
| DI | De-ionized Water |
| DIL | Diffuser Insertion Loss |
| DOC | Department of Commerce |
| DOF | Department of Finance |
| DOSE | Exposure Of Noise To An Employee |
| DPR | Department of Parks and Recreation |
| dscf | Dry Standard Cubic Feet |

**E**

| | |
|---|---|
| EBD | Ethylene Dibromide |
| EHS | Environmental Health System |
| EIA | Electronic Industry Association |
| EIR | Environmental Impact Report |
| EJMA | Expansion Joint Manufacturing Association |
| EMF | Electric and Magnetic Fields |

| | |
|---|---|
| ENM | Environmental Noise Model |
| EPC | Engineering, Procurement, and Construction |
| ERC | Emission Reduction Credit |
| Es | Exeter Sandy Loam |
| ESA | Environmental Science Associates |
| ESA | Environmentally Sensitive Area |

**F**

| | |
|---|---|
| $^{o}$F | Degrees Fahrenheit |
| FASL | Feet Above Sea Level |
| FC | Federal Candidate |
| FCFPD | Fresno County Fire Protection District |
| FCMFCD | Fresno County Metropolitan Flood Control District |
| FD | Federally Delisted |
| FE | Federally Endangered |
| FEMA | Federal Emergency Management Agency |
| FESA | Federal Endangered Species Act |
| FID | Fresno Irrigation District |
| FM | Factory Mutual |
| FM | Fire Marshal |
| FP | Fully Protected |
| FS | Facility Study |
| FSC | Federal Species of Concern |
| FSI | Farmland of Statewide Importance |
| FSNL | Full Speed No Load |
| FT | Federally Threatened |

**G**

| | |
|---|---|
| G | Gauss |
| GAC | Granulated Activated Carbon |
| GE | General Electric |
| GO | General Order |
| gpm | Gallons Per Minute |
| GSU | Generator Step-up |

**H**

| | |
|---|---|
| HAPS | Hazardous Air Pollutants |
| Hc | Hanford Sandy Loam |
| HEI | Heat Exchange Institute |

| | |
|---|---|
| HIS | Hydraulic Institute Standards |
| Ho | Hanford Fine Sandy Loam |
| hp | Horsepower |
| hpy | Hours Per Year |
| HRA | Health Risk Assessment |
| Hst | Hesperia Fine Sandy Loam |
| Hsy | Hesperia Fine Sandy Loam |
| HVAC | Heating, Ventilating, and Air-Conditioning Systems |
| Hz | Hertz |

**I**

| | |
|---|---|
| ICEA | Insulated Cable Engineers Association |
| IEEE | Institute of Electrical and Electronics Engineers |
| IES | Illuminating Engineering Society of North America |
| IIPP | Injury and Illness Prevention Plan |
| Inh | Inhalation Route |
| ISA | Instrumentation, Systems, and Automation Society |
| ISO | International Standards Organization |

**J**

| | |
|---|---|
| j/kg-k | Joules Per Kilogram Degree Kelvin |

**K**

| | |
|---|---|
| kg | Kilogram |
| kg/m3 | Kilograms Per Cubic Meter |
| KRCD, District | Kings River Conservation District |
| KRCDPP | Kings River Conservation District Peaking Plant |
| kv | Kilovolt |
| kw | Kilowatt |

**L**

| | |
|---|---|
| L(n) | Hourly Statistical Noise Level Descriptors |
| LACM | Los Angeles County Natural History Museum |
| LAER | Lowest Achievable Emission Rate |
| LAFCO | Local Agency Formation Commission |
| lbs/day | Pounds Per Day |
| lbs/hr | Pounds Per Hour |
| lbs/yr | Pounds Per Year |
| LDL | Larson Davis Laboratories |

| | |
|---|---|
| Ldn | Day/Night Average Sound Level |
| Leq | Equivalent Or Energy-Averaged Sound Level |
| LERC | Local Emergency Planning Commission |
| Lmax | Highest Root-Mean-Square Sound Level Measured Over A Given Period Of Time |
| LMID | Labor Market Information Division |
| LO/TO | Lock Out/Tag Out |
| LORS | Laws, Ordinances, Regulations and Standards |
| LOS | Level of Service |

**M**

| | |
|---|---|
| µg/m3 | Micrograms Per Cubic Meter |
| µmho/cm | Micromhos Per Centimeter |
| m | Meter |
| m/sec | Meters/Second |
| MBMA | Metal Building Manufacturers Association |
| MCET | Multi-Pollutant Cost Effectiveness Threshold |
| MCWD | Malaga County Water District |
| MEI | Maximally Exposed Individual |
| MG | Milligauss |
| mg/kg/day | Milligrams Per Kilograms Per Day |
| ML | Silt |
| mg/l | Milligrams Per Liter |
| MLD | Most Likely Descendant |
| mm | Millimeter |
| MMBtu/hr HHV | Million British Thermal Units Per Hour Higher Heating Value |
| MMBtu/hr LHV | Million British Thermal Units Per Hour Lower Heating Value |
| MMhos/cm | Millimhos Per Centimeter |
| mmhos/cm@20C | Millimhos Per Centimeter at 20 Celsius |
| MM/scf | Millions of Standard Cubic Feet |
| MNBMC | Migaratory Nongame Birds of Management Concern |
| MSA | Metropolitan Statistical Area |
| MSCFD | Million Standard Cubic Feet Per Day |
| MSDS | Material Safety Data Sheet |
| MSL | Mean Sea Level |
| MSS | Manufacturers Standardization Society of Valves and Fittings Industry |
| MVA | Million Volt Amperes |
| MW | Megawatt |

| | |
|---|---|
| MWWTF | Malaga Waste Water Treatment Facility |

**N**

| | |
|---|---|
| N/A | Not Available or Not Applicable |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NAAQS | National Ambient Air Quality Standards |
| NACE | National Association of Corrosion Engineers |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NAHC | Native American Heritage Commission |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturers Association |
| NEPA | National Environmental Policy Act |
| NESC | National Electrical Safety Code |
| NESHAPS | National Emissions Standards for Hazardous Air Pollutants |
| NFPA | National Fire Protection Association |
| NHPA | National Historic Preservation Act |
| NO2 | Nitrogen Dioxide |
| NOI | Notice of Intent |
| NOI | Notice of Intent |
| NOx | Oxides of Nitrogen |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | U. S. Natural Resource Conservation Service |
| NRHP | National Register of Historic Places |
| NSPS | New Source Performance Standard |
| NSR | New Source Review |
| NTU | Nephelometric Turbidity Unit |

**O**

| | |
|---|---|
| O&M | Operation and Maintenance |
| O2 | Oxygen |
| O3 | Ozone |
| OEHHA | Office of Environmental Health Hazard Assessment |
| OES | Office of Emergency Services |
| OF/FA/FA | Oil Air/Forced Air/Forced Air |
| OHP | Office of Historic Preservation |
| OMB | Office of Management and Budget |
| OSHA | Occupational Safety and Health Administration |

**P**

| | |
|---|---|
| PA | Public Address |
| PA | Project Archaeologist |
| PAH | Polycyclic Aromatic Hydrocarbons |
| Pb | Lead |
| PBX | Private Branch Exchange |
| PCI | Restressed Concrete Institute |
| PCS | Plant Control System |
| PE | Proposed Endangered |
| PFI | Pipe Fabrication Institute |
| PG&E | Pacific Gas and Electric |
| PL | Public Law |
| PM10 | Particulate Matter (10 Microns Diameter And Smaller) |
| $PM_{2.5}$ | Particulate Matter (.5 Microns Diameter And Smaller) |
| PPA | Power Purchase Agreement |
| PPE | Personal Protective Equipment |
| ppm | Parts Per Million |
| ppmvd | Parts Per Million By Volume Dry |
| PRC | Public Resources Code |
| PRMMP | Paleontological Resources Monitoring and Mitigation Program |
| PSA | Professional Services Industries, Inc. |
| PSD | Prevention of Significant Deterioration |
| psig | Pounds Per Square Inch Gage |
| PSS | Power System Stabilizer |
| PT | Proposed Threatened |
| PTO | Participated Transmission Owner |

**Q**

**R**

| | |
|---|---|
| RACT | Reasonably Available Control Technology |
| RBLC | RACT/BACT/LAER Clearinghouse |
| RCRA | Resource Conservation and Recovery Act |
| REL | Reference Exposure Levels |
| RH | Relative Humidity |
| RMP | Risk Management Plan |
| RMS | Root Mean Square |
| RO | Reverse Osmosis |
| ROC | Reactive Organic Compounds |

| | |
|---|---|
| rpm | Revolutions Per Minute |
| RWQCB | Regional Water Quality Control Board |
| RWRF | Regional Waste Water Reclamation Facility |

**S**

| | |
|---|---|
| S | Second |
| SAMA | Scientific Apparatus Makers Association |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| Scf | Standard Cubic Feet |
| SCG | Southern California Gas Company |
| SCR | Selective Catalytic Reduction |
| SE | State Endangered |
| SERC | State Emergency Response Commission |
| SFC | State Fire Code |
| SHPO | State Historic Preservation Office |
| SIP | State Implementation Plan |
| SIS | System Impact Study |
| SJVAPCD | San Joaquin Valley Air Pollution Control District |
| SLR | Single Lens Reflex |
| SM | Silty Sand |
| SMACCNA | Sheet Metal and Air Conditioning Contractor's National |
| SO2 | Sulfur Dioxide |
| SOI | Sphere of Influence |
| SPPE | Small Power Plant Exemption |
| SR | State Route |
| SSC | Species of Special Concern |
| SSJVIC | Southern San Joaquin Valley Information Center |
| SSPC | Steel Structures Painting Council |
| ST | State Threatened |
| SVP | Society of Vertebrate Paleontology |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resources Control Board |

**T**

| | |
|---|---|
| TAC | Toxic Air Contaminants |
| TCC | Total Capital Cost |
| TDC | Total Direct Cost |
| TDOC | Total Direct Operating Cost |
| TEMA | Tubular Exchanger Manufacturer Association |

| | |
|---|---|
| TIC | Total Indirect Cost |

**U**

| | |
|---|---|
| UBC | Uniform Building Code |
| UCMP | University of California Museum of Paleontology |
| UL | Underwriters Laboratory |
| UPRR | Union Pacific Railroad |
| UPS | Uninterruptible Power Supply |
| US | United States |
| USC | United States Code |
| USCS | Unified Soil Classification System |
| USDA | United States Department of Agriculture |
| USDOC | United States Department of Conservation |
| USDOE | United States Department of Energy |
| USEPA | United States Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UTM | Universal Transverse Mercator |

**V**

| | |
|---|---|
| V/C | Volume/Capacity |
| VAC | Voltage Alternating Current |
| VDC | Voltage Direct Current |
| VDEW | Acceptance and Performance Test of Air Cooled Condenser |
| v/m | Volts Per Meter |
| VOC | Volatile Organic Compound |
| VPH | Volume Per Hour |

**W**

| | |
|---|---|
| WSA | William Self Associates, Inc, |
| WWTP | Wastewater Treatment Plant |

**X**

**Y**

**Z**

| | |
|---|---|
| ZLD | Zero Liquid Discharge |

# CHAPTER 1.0 EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

Kings River Conservation District (KRCD) is submitting this application for a Small Power Plant Exemption (SPPE) to the California Energy Commission (CEC) for the KRCD Peaking Plant (KRCDPP). Under the Warren Alquist Act (Public Resources Code (PRC)) Section 25000 et. seq.), the CEC has the responsibility for licensing all power plants in the State of California that are over 50 megawatts (MW) in capacity. Projects between 50 and 100 megawatts (MW) may be exempt from this licensing process if the CEC determines that there is no potential for substantial adverse impact on the environment or energy resources resulting from construction or operation of the facility. Projects exempt from the licensing process are eligible for the SPPE process (PRC Section 25541 (Amended 1999).

This SPPE application was prepared in accordance with applicable requirements of the CEC Rules of Practice and Procedure and Power Plant Site Certification Regulations, specifically Article 5 and Appendix F (CEC, 2000). This SPPE application provides, in part:

- A detailed description of the proposed KRCDPP;
- A discussion of the environmental and energy resources impacts that may result from the construction and operation of the proposed KRCDPP;
- A discussion of proposed alternatives to the proposed KRCDPP and an identification of mitigation measures that are proposed to reduce the potential for environmental impacts; and
- A discussion of the proposed KRCDPP's compliance with all applicable federal, state and local laws, ordinances, regulations and standards (LORS).

## 1.2 PROJECT OVERVIEW

### 1.2.1 Kings River Conservation District

The KRCDPP is being developed, and will be owned and operated by KRCD. KRCD is a multi-county special district public agency created in 1951 by a special act of the California Legislature. KRCD provides resource management for the Kings River region serving agriculture, business and residential communities within a 1.2 million acre service area in portions of Fresno, Kings and Tulare counties. The mission of KRCD is to provide flood protection, achieve a balanced and high quality water supply, and develop power resources on the Kings River for the public good. The proposed KRCDPP

would be located near the Community of Malaga, in Fresno County and within the service territory of KRCD.

Other generating facilities owned and operated by KRCD include the Pine Flat Power Plant, a major hydroelectric facility located at the base of Pine Flat Dam on the Kings River situated in Fresno County approximately 25 miles east of Fresno. The Pine Flat Power Plant, which began full commercial operation in 1984, consists of three generating units each with a 55 MW capacity. All energy produced at the Pine Flat Power Plant is purchased by the California Department of Water Resources (CDWR) under a long-term contract for use in the operation of the State Water Project.

### 1.2.2 Power Purchase Agreement

In November 2002, CDWR and Williams Energy Marketing and Trading Company (Williams Energy) executed a settlement agreement with respect to the Power Purchase Agreement (PPA) between CDWR and Williams Energy. As part of the settlement agreement, Williams Energy transferred ownership of six General Electric (GE) LM6000 Sprint model natural gas fired combustion turbine generators (CTGs) and associated equipment to the State of California. Williams Energy also agreed to pay funds into an escrow account to be used to pay costs incurred by the state for the development of power plants utilizing the CTGs. On December 31, 2002, KRCD executed an Implementation Agreement and a long–term (10 year) PPA with CDWR for the development and operation of a power plant utilizing two of these CTGs. Since the CTGs and development funds are provided through the State of California and as a result of a state power contract with CDWR, both CDWR and the California Power Authority (CPA or Authority) are active participants in the planning and development of the proposed KRCDPP.

### 1.2.3 Project Description

KRCD proposes to develop an approximately 97 MW natural gas-fired, peaking power plant to be located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. KRCD currently has an option to purchase approximately 19 acres of land; the KRCDPP site would consist of the southern 9.5 acres of the property. The northern 9.5 acres would be used for temporary staging and parking areas during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-

ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Table 1.2-1 provides some land use and zoning information for the project site. Figure 1.2-1 shows the regional area. Figure 1.2-2 shows the general project location in relation to the service territory boundaries of KRCD. Figure 1.2-3 shows the project site, including staging and laydown areas, parking areas, and the associated linear facilities. The CTGs were received from a GE storage unit in Houston, Texas in March and April 2003. The CTGs and equipment are now located in storage units on the western side of a 60 acre parcel that is adjacent to the KRCDPP project site.

**Table 1.2-1**
**Land Use and Location Information**
**KRCDPP**

| Assessor's Parcel Number | Site Address | Site Location Information | Current Zoning/Land Use |
|---|---|---|---|
| 330-050-23S | 2611 E. North Avenue | Southwest corners of North and Chestnut Avenues | Industrial (M-3) |

The KRCDPP will consist of two natural gas fired simple cycle combustion turbine based peaking power generating units located on a single common site. Each of the CTGs includes an air-cooled electric generator with an output voltage of 13.8 kilovolts (kV). Each also includes lubricating oil storage and coolers, a water injection system for Sprint and nitrous oxide (NOx) control, fire protection, control systems, and system enclosures. Inlet air to the CTGs will be chilled using a water-cooled chilling process. NOx emissions from the KRCDPP will be controlled by injecting water into the CTGs and by passing the CTG exhaust gas through a selective catalytic reduction (SCR) system which utilizes aqueous ammonia. Carbon monoxide (CO) emissions will be controlled through the use of an oxidation catalyst. Common facilities will include natural gas compressors, electric switchyard and transmission line, maintenance and control building, an access road and parking area.

Each CTG will be installed in a simple cycle plant configuration. Fuel will be natural gas supplied from an approximately 700 foot interconnection to the existing local Pacific Gas and Electric (PG&E) gas transmission line that parallels North Avenue. The natural gas will be compressed and filtered on site to meet GE requirements. PG&E will construct, own and operate the gas interconnection.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the PG&E Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line. PG&E will construct, own and operate the transmission interconnection.

Water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Water will be demineralized using either a permanent or temporary (leased) water treatment system on site, and used for NOx control, Sprint power augmentation and air chiller cooling tower needs. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues. MCWD will construct, own and operate the water interconnection.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph. MCWD will construct, own and operate the sewer interconnection.

### 1.2.4 Project Objectives

The development of the KRCDPP is important to meet both objectives of the State of California (including CDWR and CPA) as well as objectives of KRCD. State of California objectives include:

- Add additional peaking generating capacity in areas of the State of California with the greatest demand.
- Provide for the development of peaking power plant units using the LM6000 generators that were received by the State of California as part of the renegotiated Williams Energy PPA.
- Develop cost-effective peaking power using development funds paid into an escrow fund by Williams Energy as part of the contract renegotiation.

KRCD objectives include:

- Improve the local reliability of the electric grid in the greater Fresno area by providing for additional generation within the service territory of KRCD.
- Establish local involvement in the generation and delivery of electricity.
- Continue KRCD's role as a developer of electric generation.

### 1.2.5 Project Schedule

The KRCDPP is currently targeted to enter commercial operation by December 31, 2004. Detailed engineering and procurement is scheduled to begin in March 2004, with construction expected to commence in June 2004 and take approximately 6 months to complete.

## 1.3 ENVIRONMENTAL CONSIDERATIONS

Fifteen environmental resource areas were analyzed in this SPPE application for potentially significant impacts associated with the development, construction and operation of the proposed KRCDPP. Detailed descriptions of the analysis are included in Chapter 5, Environmental Considerations, and are also summarized below by resource area. Based on the analysis in this application, it has been determined that the construction and operation of the proposed KRCDPP, with the mitigation measures proposed herein, will not result in any significant environmental impacts.

### 1.3.1 Air Quality

The impacts of KRCDPP emissions on air quality concentrations were calculated using the U.S. Environmental Protection Agency (USEPA) Industrial Source Complex (ISCST3 version 02035) air dispersion model. The modeling included emissions from

the two CTGs, two cooling towers, and the ZLD evaporative tower. Air dispersion modeling results for the KRCDPP's construction phase, as well as calculations of the potential pollutant increase during construction, indicate that mitigated emissions for the KRCDPP will be of the same magnitude as similar projects, which when best available mitigation measures are applied do not cause significant impacts. During operations, the emissions of criteria pollutants will be mitigated, as required by applicable regulations, through the imposition of Best Available Control Technology (BACT), which will minimize emissions at their source. These minimized emissions will be mitigated further through the acquisition of emission reduction credits (ERCs) for oxides of nitrogen (NOx), volatile organic compounds (VOC), particulate matter 10 microns diameter and smaller (PM10) and sulfur dioxide (SO2). The KRCDPP's impacts of criteria pollutants, based on maximum emissions rates, are minor and below all of the USEPA significance (de minimis) levels. Therefore, the KRCDPP will not cause or significantly contribute to a violation of any ambient air quality standard (AAQS), and it is reasonable to conclude that no significant cumulative impacts will result from KRCDPP implementation.

### 1.3.2 Noise

Continuous hourly noise measurements were taken at 3 locations for a period of 25 hours to determine the background noise levels in the area of the proposed KRCDPP. The background daytime and nighttime hourly noise levels at the monitoring sites were determined based upon the average of the quietest 4 consecutive hours of measured noise levels during each of the noise measurement periods. During the construction phases of the KRCDPP, noise from construction activities will dominate the noise environment in the immediate area; however, construction activities will be temporary in nature, typically occurring during normal working hours. The KRCDPP is being designed with silencer packages on the turbine exhaust stacks. The operation of the KRCDPP, with the inclusion of silencer packages on the turbine exhaust stacks will result in an increase in noise levels of between 0 and 1 decibels (dB) at the nearest sensitive receptor, which complies with applicable City of Fresno exterior noise level criteria. The KRCDPP will not result in any significant impacts to the existing noise environment.

### 1.3.3 Water Resources

The proposed KRCDPP would use potable water from the MCWD existing water supply system for domestic, cooling, and process water demands. MCWD gets its water supply from the underlying groundwater and has a single distribution system that delivers water for both potable and non-potable uses in the area. All customers, whether residential, commercial or industrial within the MCWD service territory and/or served by MCWD get their supply from groundwater. MCWD has provided a will-serve letter to the KRCD stating that sufficient supply is available to meet the water needs of the KRCDPP. The

proposed KRCDPP will mitigate the potential for impacts by complying with all applicable LORS and would not result in a significant impact to local water supplies.

### 1.3.4 Visual Resources

The development pattern found in the area of the KRCDPP generally consists of a mixture of urban and rural, residential, commercial, industrial and agricultural uses. The project area occupies relatively flat terrain situated in an area comprised primarily of industrial and warehouse structures and vacant land and the currently vacant site occupies relatively level terrain covered in a mixture of brush, grass and pavement. As part of this visual resources analysis, computer-generated visual simulations were prepared to illustrate "before" and "after" visual conditions in the project area. The simulations illustrate the location, scale and conceptual appearance of the proposed KRCDPP as seen from representative viewpoints. The KRCDPP would introduce a new industrial facility into a landscape setting, which currently includes a variety of existing industrial structures. Overall, the KRCDPP would not substantially alter the character or quality of existing views currently experienced by the public in the project vicinity.

### 1.3.5 Land Use

Characteristic land uses surrounding the project site include: heavy industrial (M-3) manufacturing (M-1), warehouse/commercial (C-6), residential (R-1:R-2). The KRCDPP project site is zoned Heavy Industrial (M-3) and this zoning is intended to provide for the establishment of all industrial uses essential to the development of a balanced economic base. The proposed KRCDPP will not result in any significant impacts to land use. Development of the KRCDPP is an acceptable use based on existing zoning and land use designations for Fresno County, the jurisdiction where the KRCDPP is located. Land use impacts associated with the proposed KRCDPP will not be significant because the activities are compatible with existing land uses and contribute to the continued use of the industrially zoned area for industrial purposes.

### 1.3.6 Agriculture and Soils

The KRCDPP project area is located in the middle of Fresno County and includes the most urbanized area of the County. Land uses in this area generally consist of a mixture of urban and rural, industrial, commercial, residential and agricultural uses. There are no areas of agricultural significance within the project site or along the associated linear facilities. No impact to agricultural resources is anticipated as a result of the KRCDPP. The greatest potential impact associated with the KRCDPP is wind and water erosion as a result of temporary disturbance associated with construction activities. However, the potential for impacts is minimized by the wind/water erosion hazard classification of the soils in the area, which is rated at slight/none. In addition, KRCD will impose best

management practices (BMPs) during and after construction to minimize the potential for soil erosion and sedimentation associated with construction of the KRCDPP.

### 1.3.7 Traffic and Transportation

The major access to the KRCDPP project site would be from North Avenue, a two-lane arterial roadway with a rural character that generally runs east to west. Other roads that would likely be accessed during construction and operation of the KRCDPP include Golden State Boulevard (north of Central Avenue) and Chestnut Avenue. Construction of the KRCDPP, including the associated linear facilities, will take approximately 6 months and create a total of 55 one-way trips to the KRCDPP or 110 round trips per day on average and an estimated 162 trips per day during peak periods. The number of trucks required during construction of the KRCDPP and associated linear facilities is estimated to be 5 trucks daily with a conservative "worst case" of approximately 15 trucks per day. This correlates to increases in average daily traffic volumes of approximately 5 percent on Chestnut Avenue between North Avenue and SR99 and 3.5 percent on North Avenue between State Route 99 and the project site; the roads most likely affected during construction activities. Even with the addition of the peak construction workforce, traffic associated with construction of the KRCDPP would not lower the existing level of service (LOS) of these local or state roadways, which currently operate at level of service A and B, the best possible ratings. Overall, the number of transport to deliver and remove hazardous and non-hazardous materials from the KRCDPP during operations will also be minimal and will not change the existing LOS of applicable roadways. There will be no significant impacts to local roadways as a result of traffic associated with the KRCDPP.

### 1.3.8 Public Health

Emissions of non-criteria pollutants, also known as toxic or hazardous air pollutants, from normal operation of a power generating facility can pose a potentially significant risk to public health, if these emissions are generated in sufficient quantities. For the KRCDPP's combustion turbines, emissions of relatively small amounts of these substances result from the combustion of natural gas. For the cooling towers and ZLD evaporative tower, emissions, which are based on the composition of the water being used, are due to trace amounts being carried away in the towers' drift. Impacts from pollutants, which are emitted by the KRCDPP and on either of these lists, were evaluated. Generally, increased cancer risks of less than 1 in a million ($1 \times 10^{-6}$) and hazard indices of less than 1 are considered acceptable levels of health risk. The maximum excess lifetime cancer risk for the KRCDPP was projected to be 0.008 in a million ($.008 \times 10^{-6}$) or 8 in a billion ($8 \times 10^{-9}$). The maximum impacts occurred at the southeast fence line. The KRCDPP's projected health risks are well within acceptable levels.

### 1.3.9 Worker Health and Safety

Certain construction and operation and maintenance (O&M) activities associated with the proposed KRCDPP have the potential to expose workers to a wide variety of physical and chemical hazards. Worker exposure to these hazards will be minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures and through compliance with the applicable health and safety LORS. Workers participating in the construction and O&M of the proposed KRCDPP will also be required to participate in applicable safety training programs designed to protect themselves and others from injuries. No significant unavoidable adverse impacts to worker health and safety are anticipated as result of the proposed KRCDPP.

### 1.3.10 Hazardous Materials and Waste Management

Certain hazardous materials would be used and stored onsite during construction and O&M of the proposed KRCDPP including substances such as cleaners, sealers and solvents, and hydraulic and lubricating oils. Aqueous ammonia will also be used onsite to control NOx emissions through SCR. The proposed KRCDPP will include a number of design features to reduce the likelihood and minimize the impacts of inadvertent release of hazardous materials. All hazardous materials will be stored on-site in tanks or other containers, which are approved for such use. Materials that are incompatible will be stored separately. Also, to assess the potential for impacts associated with the use of aqueous ammonia, emergency release scenarios were evaluated to predict the downwind concentrations of ammonia and to assess the extent of the toxicity of the release. Emissions from the modeling scenarios were calculated and the results of the emergency release modeling showed that it is reasonable to conclude that there will be no significant off-site impacts from an accidental release of aqueous ammonia.

### 1.3.11 Geologic Resources and Hazards

The KRCDPP project site is located in central Fresno County at an elevation of about 290 feet above mean sea level and the topography surrounding the site is relatively flat and slopes gently to the southeast. Since the area of the KRCDPP has been subjected to strong shaking by earthquakes, the potential for dynamic compaction is low to moderate.
The potential for hydrocompaction and subsidence to be a significant site hazard is also moderate to low. Since the site is relatively flat, the potential for slope instability, landslides, or substantial soil erosion is also low. The KRCD site is not located near the coast or any significant bodies of water, and therefore, tsunamis and seiches are not considered potential hazards. The potential for volcanic hazards affecting the KRCDPP project site is unlikely since the nearest volcanic centers are at least 70 miles from the project site. The KRCDPP will not result in any significant impacts to geologic resources.

### 1.3.12 Socioeconomics

Construction of the proposed KRCDPP including associated linear facilities will have no impact with respect to inducing substantial population growth, but will have a short-term beneficial impact to qualified labor. Project construction will create an average demand of 68 workers a month. These temporary workers would likely be drawn from the Community of Malaga, Fresno County, and the surrounding counties and regions. The proposed KRCDPP will not require the construction of additional housing to support the temporary worker population, nor will it impact the local housing inventory. Construction and O&M of the KRCDPP would have no significant impact on existing public services.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," signed on February 11, 1994, requires all federal agencies to develop environmental justice strategies. Federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The KRCDPP will result in a less than significant environmental justice impact.

### 1.3.13 Cultural Resources

Cultural resources, which could be present in the KRCDPP project area, include historic and prehistoric archaeological sites, historic architectural and engineering features and structures, and sites and resources of traditional cultural significance to Native Americans and other groups. Record searches and field surveys revealed no historic or archaeological sites at either the KRCDPP project site or in the area of the proposed linear facilities. Additionally, no known/recorded Native American traditional cultural properties are present in the area. It is possible that currently unknown or unrecorded archaeological resources could be encountered during subsurface construction that penetrates native soils. Mitigation measures are proposed that would reduce such possible impacts to archaeological resources discovered during construction to a less-than-significant level.

### 1.3.14 Paleontological Resources

Paleontological resources, or fossils, are the remains, imprints or traces of once-living organisms preserved in rocks and sediments. Prior to the field survey, published and available unpublished geological and paleontological literature was reviewed and evaluated, and museum locality and specimen database searches were conducted to develop a baseline paleontological resource inventory for the geologic units present within the project site, the surrounding area, and similar types of deposits elsewhere in

the Great Valley and within California. During field surveys, scattered small rhizoliths, as well as two larger root casts, were observed, but no other fossils were visible. No other exposures of subsurface sediments were visible anywhere within the KRCDPP project area and no fossils were found. It is possible that paleontological resources could be encountered during deep subsurface construction excavations that penetrates native soils. Mitigation measures have been identified that would reduce such possible impacts to a less-than-significant level.

### 1.3.15 Biological Resources

The KRCDPP project site is a disked fallow field within an industrially developed area. It possesses mainly non-native weedy grasses and forbes which have grown since the field's last disking. Information pertaining to threatened, endangered, or other special-status species that may occur in the KRCDPP project area was collected from several sources. Though record searches showed a variety of special-status wildlife and plants occur in the general region of the proposed KRCDPP, no sensitive species or habitats were observed on the project site or in the area of the proposed linear facilities during the reconnaissance surveys. Wildlife and plants, which were observed, are typical of disked fallow fields and vacant lots. As a preventive measure, a preconstruction survey will be conducted for the Western Burrowing Owl prior to construction. No negative or adverse impacts will occur to biological resources, including special-status species and habitats and thus no mitigation is proposed as a result of the proposed KRCDPP.

## 1.4 ALTERNATIVES

In accordance with the Warren-Alquist Act and to comply with the requirements of CEC regulations, a review of feasible alternatives was conducted. Chapter 6, Alternatives, contains an analysis of the reasonable range of alternatives considered that would meet the basic objectives of the KRCDPP while reducing the potential for significant environmental impacts. The review of alternatives was conducted in accordance with Appendix F (f) of the CEC regulations, which require:

> "A discussion of proposed alternatives to the power plant, including the alternative of no power plant, and any mitigation measures proposed to reduce environmental impact."

A No Project Alternative was considered but was determined to not be feasible since it did not meet the objectives of the State of California to develop peaking power in parts of the state with the greatest demand and to use the LM6000 peaking generators and development funds received by the state as part of the renegotiation of the Williams

Energy PPA. The No Project Alternative also does not meet objectives of KRCD to develop additional generation within KRCD service territory to meet growing demand.

The majority of the alternatives analysis in Chapter 6 related to the site selection process. At the beginning of the planning process, the option of placing both LM6000 generators on one-site and the option of placing the two LM6000 generators on two separate sites were both considered. Initially, there were 24 sites identified. The decision was then made that both generators would be placed on a single site. Based on a preliminary analysis of the availability of natural gas and electric transmission interconnection to serve both LM6000 generators on a single site and a review of potential biological issues, the list of potential sites was reduced down to six sites. Further review reduced the list of sites down to two. The final site selection was then made based on a review of available electric interconnection information, a review of interconnection and development costs and an analysis of the pros and cons of the two final potential sites. A final recommendation for the site was provided by CDWR based on consideration of these factors.

Due to the nature of the development of the proposed KRCDPP, and the fact that the units to be developed were provided by the State of California, the review of alternative configurations and alternative generating technologies was limited in scope and did not consider technologies that would have likely been considered under a different development scenario (i.e. oil versus natural gas operated turbines, combined cycle versus simple cycle, commercial availability and cost effectiveness of generating technologies and generators, etc.). Alternatives to KRCDPP configuration that were considered include the use of evaporative coolers or an inlet air chilling system (i.e. chillers).

## 1.5 LIST OF PREPARERS

Chapter 7 includes a list of those persons responsible for the preparation of the KRCDPP SPPE application.

## 1.6 APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

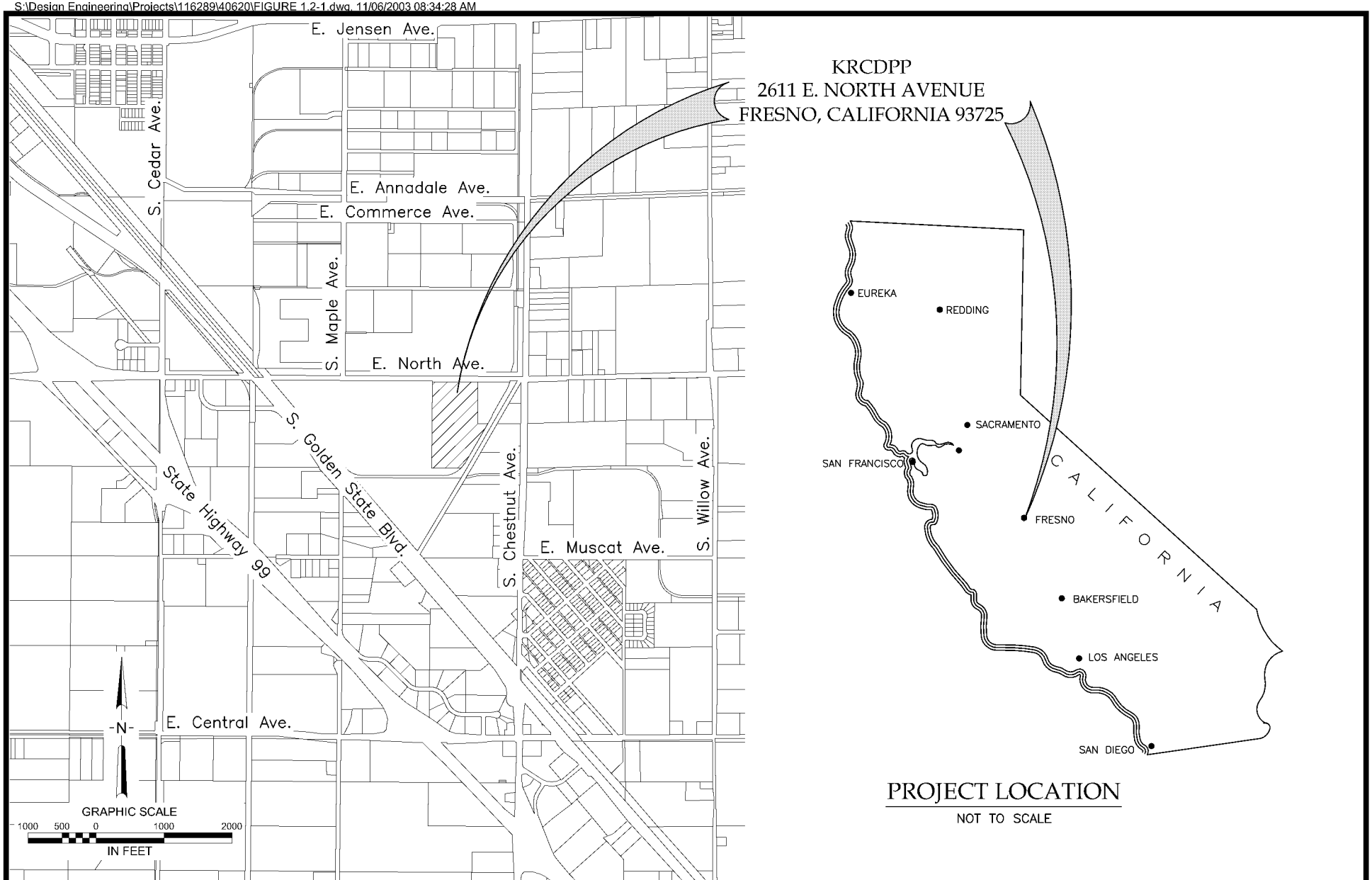
Each environmental resource section analyzed in Chapter 5, Environmental Considerations, contains of list of applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) that are applicable to that particular resource section. Each environmental resource section analyzed in Chapter 5 also contains of list of permits that are applicable to that particular resource section.

## 1.7 REFERENCES

CEC, 2002. California Energy Commission, 2000. Rules of Practice and Procedure and Power Plant Site Certification Regulations. August 2000 and revisions.

MID, 2003. Administrative Draft – Modesto Electric Generation Station Small Power Plant Exemption Application. Prepared for Modesto Irrigation District by CH2M Hill. April 14, 2003.

S:\Design Engineering\Projects\116289\40620\FIGURE 1.2-1.dwg, 11/06/2003 08:34:28 AM




KRCD
King River Conservation District

FIGURE 1.2-1

Regional Area of the KRCDPP

KRCDPP

09/30/03 REV. 0

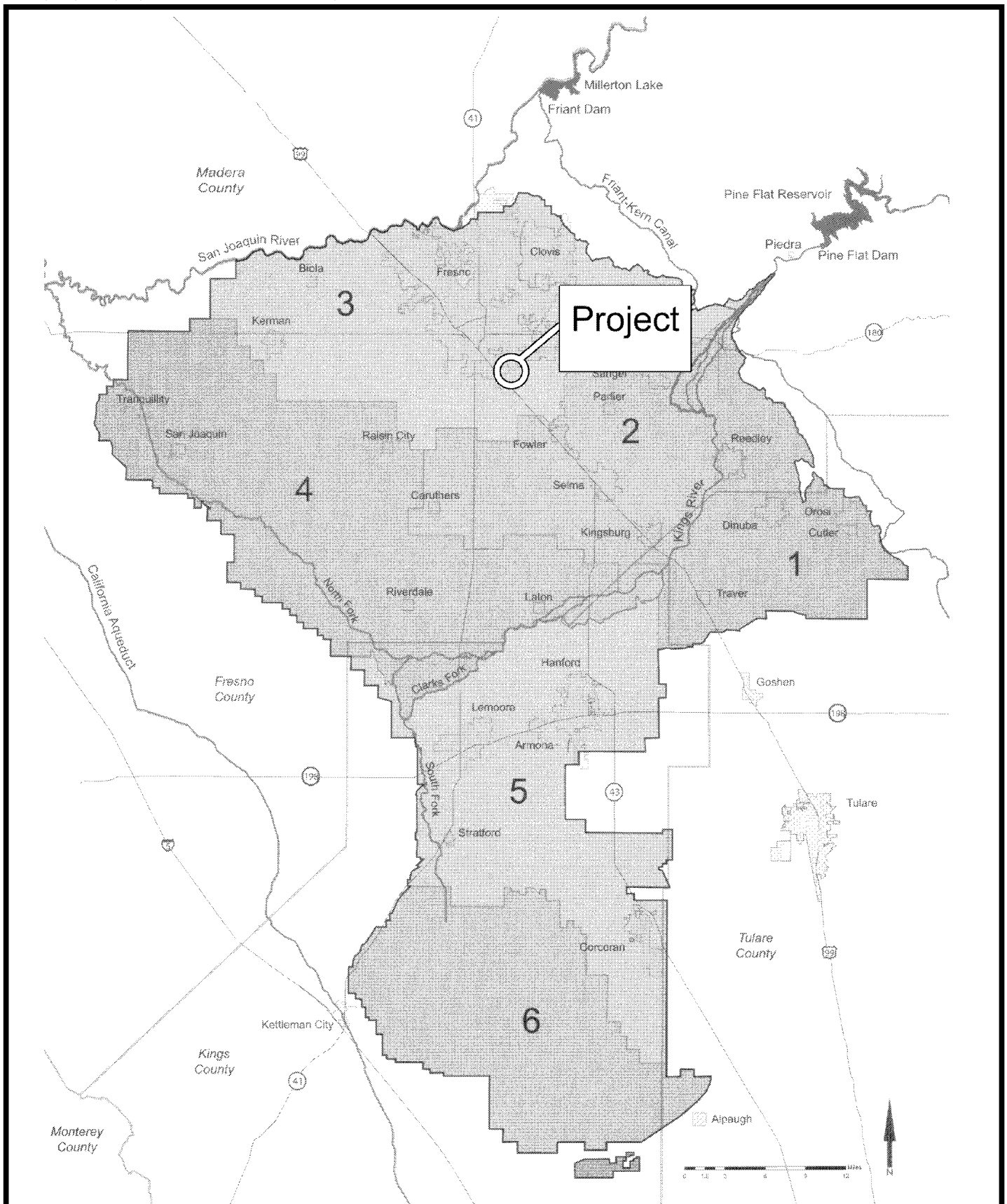


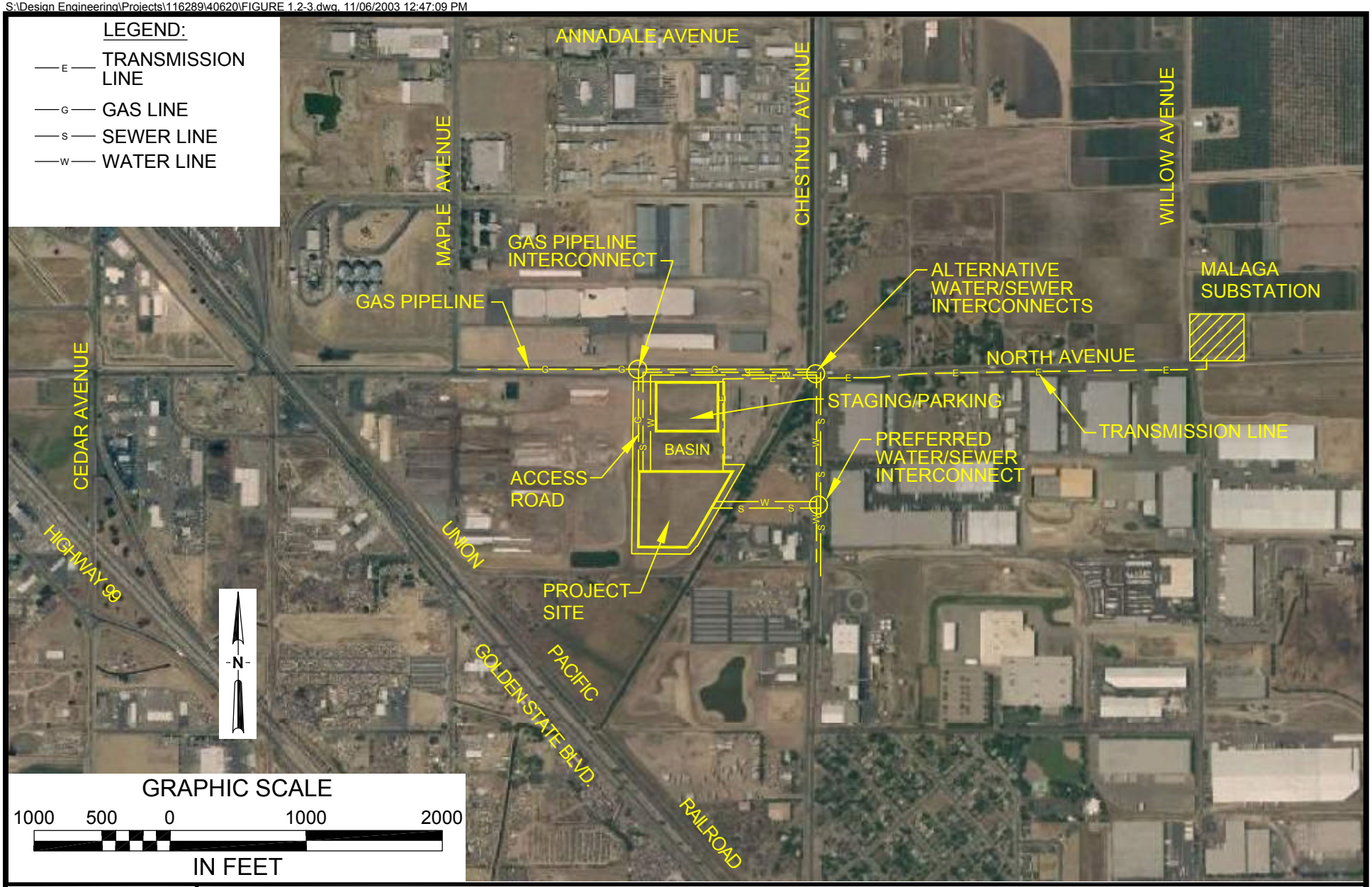

FIGURE 1.2-2

KRCD Service Territory

KRCDPP

KRCD
Kings River Conservation District

S:\Design Engineering\Projects\116289\40620\FIGURE 1.2-3.dwg, 11/06/2003 12:47:09 PM




KRCD
Kings River Conservation District

FIGURE 1.2-3

KRCDPP Project Site
and Linear Facilities

KRCDPP

09/30/03 REV. 0

# CHAPTER 2.0 PROJECT AND FACILITY DESCRIPTION

## 2.1 PROJECT SUMMARY

The Kings River Conservation District Peaking Plant (KRCDPP) will be a 97 megawatt (MW) nominal net output natural gas fired, simple cycle combustion turbine generating facility. The KRCDPP site is located near the Community of Malaga, Fresno County in an industrial area approximately one-half mile from the Pacific Gas and Electric (PG&E) Malaga Substation. The KRCDPP site is currently vacant and was previously used to park flatbed trucks and for truck maintenance, as described further in Section 5.5, Land Use.

## 2.2 PROJECT DESCRIPTION, DESIGN AND OPERATION

### 2.2.1 Site Layout

KRCD currently has an option to purchase approximately 19 acres of land and the KRCDPP site would consist of the southern 9.5 acres of the larger 19-acre property. An existing 4-acre storm water basin (500 feet by 250 feet by approximately 22 feet deep) is located on the northern 9.5 acres. During construction this basin will serve as the storm water discharge point for the site. The remaining 5 acres will temporarily be used for storage, equipment lay down, and worker parking during construction. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Figure 2.2-1, the Project Area Map shows the location of the site relative to the existing roads and structures. Figure 2.2-2, Site Layout, shows the location and orientation of major plant facilities, including the combustion turbine generators (CTGs), inlet air housing, generators, selective catalytic reduction (SCR) system, chiller/cooling tower, water treatment facilities, water storage tanks, gas compression and filtration equipment, electric transformers and switchyard. Figure 2.2-3 shows elevation drawings for the proposed KRCDPP.

The 9.5-acre KRCDPP site will be secured with a chain-link fence, which includes vinyl slating for screening. The northern 9.5-acre property that borders North Avenue will also be fenced and landscaped with plants as necessary to further reduce visual impacts, as discussed further in Section 5.4, Visual Resources. All KRCDPP roads and parking areas

will be paved and remaining areas will be covered with crushed rock or will be landscaped with plants, as necessary.

Land to the west of the proposed KRCDPP site is a vacant 60 acre parcel of industrially-zoned land that was used by Producer's Cotton Oil Company as a Cottonseed Delinting Plant until the 1980s. After the seed delinting went out of business in the 1980s, the property changed entitlements to Producer's Holding Company where it remained unused until KRCD entered into a lease agreement in March 2003 to use a portion of the property for storage of the CTGs and ancillary equipment. The CTGs and ancillary equipment are currently being stored in two of the abandoned cottonseed storage barns located near the center of the property.

### 2.2.2 Process Description

The proposed KRCDPP will consist of two General Electric (GE) LM6000 Sprint CTGs that are equipped with water injection to control oxide of nitrogen (NOx) emissions, water injection for power augmentation, and other associated support equipment providing maximum generating capacity of 99.4 MW gross. Parasitic loads will vary from 2.0 to 4.4 MW depending on the season and operating conditions, which will result in a net output of 95.0 to 97.4 MW.

In addition to the CTGs, other major equipment will include packaged inlet air chiller systems with cooling towers, a water treatment system, gas compression equipment, a wastewater treatment system, fire protection equipment, water storage tanks, process control systems and air emission control systems necessary to meet the permitted air emission limits.

Table 2.2-1, provides a summary of the major equipment that will be used at the KRCDPP.

**Table 2.2-1**
**Summary of Major Equipment**
**KRCDPP**

| Equipment | Quantity | Nominal Capacity | Description |
|---|---|---|---|
| CTG | 2 | 49,700 kW gross | GE LM6000 Sprint |
| SCR System | 2 | 3.0 ppmvd NOx<br>6.0 ppmvd CO | Ductwork and 105 foot stack |
| Aqueous Ammonia Storage | 1 | 10,000 gallons | 29% Solution, Evaporator |
| Inlet Air Chiller | 2 | 1800 tons each | Chiller and Cooling Tower |

| Table 2.2-1<br>Summary of Major Equipment<br>KRCDPP | | | |
|---|---|---|---|
| **Equipment** | **Quantity** | **Nominal Capacity** | **Description** |
| Water Treatment System | 1 | 150 gallons per minute | RO |
| Natural Gas Compressors | 3 | 12 MSCFD, 200 psig suction | Includes Gas Un-loader 700 psig discharge, 700 KW each |
| CEMS | 2 | | O2, NOx, CO |
| Oil/Water Separator | 1 | 500 gallons | Underground, Double wall |
| Demineralized/DI Water Tank | 1 | 200,000 gallons | Stainless Steel – 1 day storage |
| Wastewater Storage Tank | 1 | 80,000 gallons | Steel or Fiberglass Tank |
| Generator Step-Up Transformers | 2 | 13.8kV/115kV | 42/56/70 MVA (OA/FA/FA) |
| Auxiliary Transformers | 2 | 13.8kV/4160V<br>4160/480 V | |
| DC Battery Backup | 2 | | GE controls and Fire System |
| CO2 Fire Protection Systems | 2 | | Turbine and Generator Compartments |
| ZLD | 1 | 68 gallons per minute | |

**Acronyms:**
KW – Kilowatt
ppmvd – parts per million volume dry
RO - Reverse Osmosis
CO – Carbon Monoxide
MMSCFD – million standard cubic feet per day
psig – pounds per square in gage
O2 - Oxygen
MVA -million volt amperes
OA/FA/FA -oil air/forced air/forced air
V – Volts
CEMS - Continuous Emissions Monitoring System
CO2 – Carbon Dioxide
ZLD – Zero Liquid Discharge
DI – De-ionized

Although the KRCDPP will be designed to allow for year round operation, it is expected to operate 2500 hours per year and primarily during peak summer conditions. Net output will vary with atmospheric conditions and inlet gas pressures. Table 2.2-2 details the average expected performance of the proposed KRCDPP.

| Table 2.2-2<br>Average Expected Performance<br>KRCDPP | | |
|---|---|---|
| **Description** | **Value** | **Units** |
| Gross Plant Output | 99,400 | KW |
| Net Plant Output | 97,000 | KW |
| Nominal Fuel Consumption | 950 | MMBtu/hr HHV |
| **Acronyms:**<br>MMBtu/hr HHV – million British thermal units per hour higher heating value | | |

### 2.2.3 Combustion Turbine Generator Equipment

The proposed KRCDPP will utilize two GE LM6000 Sprint CTGs to generate electric power from natural gas. Each CTG will have a nominal fuel gas demand of 500MMBtu/hr and generate approximately 50MW. The inlet air to each CTG will be cooled using a chilled air system to maximize electric power production on hot days. Each CTG will have water injection into the low-pressure compressor, high-pressure compressor and into the combustors to increase power and lower the NOx emissions.

The CTGs will be equipped with the following accessories:

- Inlet air chilling and heating systems,
- Inlet air filters,
- Acoustical enclosures around the air intake equipment,
- Lube oil filter and cooling system for each turbine and generator,
- Water injection into the combustion system to reduce NOx to 25 parts per million (ppm),
- Sprint power boost system,
- Compressor wash system for both online and offline operations,
- Fire detection and protection system (CO2),
- Fuel gas system including flow meter, strainer and filters,
- Hydraulic start system,
- Air-cooled generator,
- Generator controls including protection, excitation, power system stabilizer (PSS), and
- Remote start capabilities.

The CTGs and some accessory equipment will also be contained in acoustical metal enclosures.

### 2.2.4 Emission Control Equipment

The air exhausting from each CTG will be directed through ductwork that contains a CO catalyst and a NOx catalyst. The CO catalyst is passive and will reduce CO emissions from the stack to 6.0 ppm. The NOx catalyst will require diluted ammonia vapor injection upstream of the catalyst, which results in a chemical reaction in the presence of the catalyst to reduce NOx to nitrogen and water. The NOx emissions from the stack will be reduced to 3.0 ppm. The NOx catalyst may require the addition of air (dilution air) upstream of the catalyst to reduce the temperature of the hot exhaust gases to match the catalyst design temperature. If this is required, air blowers will be installed on the catalyst ductwork. Ammonia slip, the unreacted ammonia in the exiting exhaust gas, will be limited to a concentration of 10 ppmvd at 15 % O2.

The ammonia injection system will be a skid-mounted unit consisting of ammonia/air mixing equipment, a vaporization system, instrumentation and control equipment. The ammonia will be stored in a 10,000-gallon horizontal aboveground storage tank. The tank and ammonia offloading area will be inside containments in the event of an ammonia spill or leak.

After the exhaust gases pass through the catalysts, the gases are directed up a 105-foot tall stack where the gases disburse into the atmosphere. The stack will be equipped with sensors to detect the concentration of NOx, CO and O2. The sensors are part of the CEMS, which will be used to ensure the exhaust gases comply with the air permit requirements. The CEMS will calculate and record the stack exhaust flow rate as well as the emissions rates of NOx, CO and O2.

### 2.2.5 Plant Auxiliaries

#### *2.2.5.1 Control System*

The KRCDPP instrumentation and control system will be designed to allow the operator to achieve safe and reliable operation of the KRCDPP from a central control room. Major equipment monitoring, control and operation will be provided to and from the control room using the plant control system. The control system will provide remote control capabilities, data acquisition, annunciation and historical storage of operating information. The system will be designed with sufficient redundancy to preclude a single failure from affecting KRCDPP control and operation.

The ability to control and monitor the KRCDPP from KRCD's Pine Flat Power Plant will also be provided[1]. The Pine Flat Power Plant is manned 24 hours a day 365 days a year.

#### *2.2.5.2 Lighting*

The lighting system will provide personnel with illumination for operation under normal conditions and egress under emergency conditions. The system will include emergency lighting to perform manual operations during an outage of the normal power source. The system will also provide 120 V convenience outlets for portable lamps and tools.

#### *2.2.5.3 Grounding*

The electrical system will be susceptible to ground faults, lightning and switching surges that can result in high voltage, constituting a hazard to site personnel and electrical equipment. To reduce the hazard potential, metal-grounding rods will be driven into the soil to form a looped grounding system. The station grounding will provide an adequate path to permit the dissipation of current created by these transient events.

#### *2.2.5.4 Cathodic Protection*

A cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending on the corrosion potential and the site soils, either passive or impressed current cathodic protection will be employed.

#### *2.2.5.5 Service Air*

The service air system will supply compressed air to hose connections for general use. Service air headers will be routed to hose connections located at various points throughout the proposed KRCDPP.

#### *2.2.5.6 Instrument Air*

The instrument air system will provide dry air to pneumatic operators and devices. An instrument air header will be routed to locations where such equipment is located.

## 2.3 FUEL SYSTEM

Natural gas is the only fuel used to fire the CTGs. Natural gas will be delivered to the site by PG&E at a nominal pressure ranging from 200 to 500 psig. Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the from

[1] KRCD owns and operates the Pine Flat Power Plant, located at the base of the Pine Flat Dam, which is the dividing point between Lower and Upper Kings River and approximately 25 miles east of Fresno. The plant harnesses the power of the river by using irrigation and flood releases from Pine Flat Reservoir to generate electricity. The Pine Flat Dam is operated by the U.S. Army Corps of Engineers.

its existing local gas transmission line that parallels North Avenue, as shown on Figure 1.2-3, in Chapter 1, Executive Summary.

The gas will be routed to a new PG&E metering station located on the southern portion of the KRCDPP site. From the metering station, gas will be directed into two electric driven 700 KW gas compressors where the gas pressure will be increased to the approximately 700 psig required by the CTGs. A third 700 KW compressor will serve as backup should one of the other compressors be taken out of service. The compressor will be equipped with gas pressure unloading systems to allow for more efficient operations when the inlet gas pressure exceeds 200 psig.

## 2.4 WATER REQUIREMENTS

The KRCDPP water balance is presented Table 2.4-1. Primary water usage is for injection into the CTGs to control NOx and provide power augmentation. The water injected into the CTGs must be treated before injection to remove dissolved solids. Water will also be used for the chilled inlet air system cooling tower system. Figures displaying the KRCDPP water balance are included as part of Chapter 3, Engineering and Design Criteria.

**Table 2.4-1**
**Water Balance**
**KRCDPP**

| From | To | Maximum Flow (in gpm) | Average Flow (in gpm) |
|---|---|---|---|
| Water from MCWD | Plant Treatment System | 141 | 141 |
| Water from MCWD | Cooling Tower | 69 | 20 |
| Water Treatment System | CTG | 106 | 106 |
| Water Treatment System | ZLD | 35 | 35 |
| Cooling Tower | ZLD | 32 | 18 |
| ZLD | Cooling Tower | 65 | 51 |
| ZLD | Atmosphere | 2 | 2 |

Assumes 2500 hours of operation during peak summer conditions
**Acronyms:**
MCWD – Malaga County Water District
gpm – gallons per minute

### 2.4.1 Water Supply System

The proposed KRCDPP will use water supplied by the MCWD, which currently serves the local area near the project site and has an existing 10-inch supply line located along

Chestnut Avenue. MCWD has one supply system that supplies water for both potable and non-potable uses in the area. Water from the MCWD would serve the domestic, cooling, and process water demands of the proposed KRCDPP.

MCWD gets its water supply from the underlying groundwater. All customers, whether residential, commercial or industrial within the MCWD service territory and/or served by MCWD get their supply from groundwater. MCWD currently has three active groundwater wells with one new well due online by the year-end of 2003. The current wells have a total water capacity of approximately 3500 gpm. The new well will have a capacity of approximately 1500 gpm, bringing MCWD water supplies to approximately 5000 gpm.

Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect into the MCWD system at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

Maximum water demand for the proposed KRCDPP will be approximately 210 gpm with a maximum annual water consumption estimated at 75 acre-feet. MCWD has assured KRCD that adequate water supply would available to meet the peak water demand required for operations.

### 2.4.2 Water Treatment System

Water from MCWD supplied to the turbine will be deionized/demineralized using an RO or an equivalent technology. This system will be designed to produce 106 gpm of treated water. The system will generate wastewater from its membranes and filters, which will contain concentrated levels of minerals from the MCWD water supply.

## 2.5 WASTEWATER SYSTEMS

### 2.5.1 Sanitary Waste

Domestic sanitary waste produced at the KRCDPP will be sent to the existing MCWD sanitary system. The MCWD sanitary sewer pipeline is located on Chestnut Avenue. The sewer pipeline from the KRCDPP will follow the same route as the water supply pipeline to Chestnut Avenue where it will interconnect with the MCWD sewer line.

### 2.5.2 Process Wastewater

KRCD is proposing the use of a ZLD system to treat process wastewater, thus eliminating wastewater discharge from the KRCDPP. The use of a ZLD system would also reduce overall KRCDPP water consumption by approximately 25%. KRCD is currently considering two onsite ZLD technologies and one offsite ZLD technology. Final selection of the ZLD system will depend on a cost and reliability analysis provided during the final design process.

The following is a brief description of each of the ZLD options that KRCD is considering:

#### *2.5.2.1 Option 1 – ZLD Reverse Osmosis/Brine Concentrator/Spray Dryer*

This ZLD option consists of a RO system, a brine concentrator and an electric air-heated spray dryer. The process would involve sending raw water through the RO system to generate DI water. The DI water would be sent to a 200,000 gallon DI water tank, while the wastewater streams from the RO reject water and the RO multi-media filter backwash water would be sent to an 80,000 gallon wastewater storage tank.

The wastewater from the wastewater storage tank would be sent to a brine concentrator spray dryer system for processing. The brine concentrator process involves concentrating and evaporating wastewater from the KRCDPP. Recovered distillate (pure water) from the brine concentrator would be sent back to a small storage tank for reuse as makeup water. The small amount of highly concentrated brine solution, which represents the only process wastewater stream not reclaimed for reuse, would be sent to an electrically heated spray dryer system where it would be evaporated, leaving a dry solid suitable for landfill disposal.

#### *2.5.2.2 Option 2 – ZLD High Efficiency Reverse Osmosis/Crystallizer*

This ZLD option utilizes a conventional water softener, and a high efficiency RO system, followed by a final crystallizer. The process involves sending raw water to a water softener system upstream of the RO system to remove hardness and alkalinity. This pre-treatment process essentially increases the overall efficiency of the RO process, which results in smaller quantities of wastewater compared to Option 1. The DI water would be sent to a 200,000 gallon water tank, while the wastewater would be sent to an 80,000 gallon wastewater tank and then to a ZLD final crystallizer. The ZLD final crystallizer process generates a highly concentrated liquid brine waste that is trucked off-site for disposal.

#### *2.5.2.3 Option 3 – ZLD Off-Site Regeneration*

In this ZLD option, raw water would be sent to a mobile ion exchange resin bed trailer to produce DI water. No RO system or other onsite permanent water treatment systems are required for this option. When a resin bed trailer is due for regeneration, it would be trucked off and replaced with a recharged resin bed trailer. The KRCDPP would have a minimum of two resin bed trailers on-site at all times to maintain reliability for uninterrupted water treatment service. The DI water would be sent to a 200,000 gallon storage tank. Because the resin beds are regenerated offsite, this option does not require a wastewater tank.

With option 3 there is also the potential to use DI water as inlet air chiller cooling tower makeup water instead of raw water. Using DI water as makeup water reduces the amount of chemicals required in the inlet air chiller cooling towers, results in very little blowdown to be sent back to the resin trailers and mixed with incoming raw water, and produces very little particulate emissions from the cooling tower compared to the other options. However, capital costs are higher because the cooling towers and associated equipment must be constructed of special non-corrosive materials.

## 2.6 MANAGEMENT OF HAZARDOUS MATERIALS

Various chemicals will be stored and used during the construction and operation of the KRCDPP. All chemicals will be stored, handled, and used in accordance with applicable laws, ordinances, regulations, and standards (LORS). Chemicals will be stored in appropriate chemical storage facilities. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Aqueous ammonia will be stored in a horizontal tank mounted in a containment basin.

Safety showers and eyewashes will be provided adjacent to or in the area of all chemical storage areas. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release.

Hazardous wastes generated by the KRCDPP will be properly managed and disposed at appropriate disposal facilities. Spent lubricating oils will be recovered and recycled by an approved waste oil-recycling contractor.

Table 2.6-1 lists the hazardous materials expected to be used or stored at the KRCDPP project site as well as their intended uses and estimated quantities to be stored on site during operations.

| Table 2.6-1<br>Hazardous Materials and Quantities<br>KRCDPP | | |
|---|---|---|
| **Material** | **Use** | **Quantity (in gallons)** |
| Aqueous Ammonia (29%) | NOx control | 10,000 |
| Cleaning Chemicals | Turbine Compressor | 10 |
| Synthetic Lubrication Oil | Turbine Bearings | 450 |
| Mineral Lubrication Oil | Generator Bearings | 1200 |
| Hydraulic Oil | Starting System | 150 |
| Mineral Insulating Oil | Transformers | 10,000 |
| Anti Scalant | Water Treatment | 55 |
| Sodium Hydroxide | Water Treatment | 450 |
| Anti Foam | Water Treatment | 55 |
| Sodium Bisulfate | Water Treatment | 55 |
| Calcium Chloride | Water Treatment | 1000 |
| Scale Inhibitors | Water Treatment | 280 |
| Sulfuric Acid | Water Treatment/Cooling Tower | 450 at each location |
| Sodium Bromide | Cooling Tower | 280 |
| Calcium Hypochlorite | Cooling Tower | 55 |
| Sodium Molybdenate | Cooling Tower | 55 |
| Propylene Glycol | Chilled Water System | 55 |
| Laboratory Reagents | Chemical Analysis | varies |

## 2.7 FIRE PROTECTION

The KRCDPP will be designed to maximize safe operation. Personnel will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the facilities. CO2 fire protection systems will protect each CTG and all ancillary equipment compartments from fire. The systems will have fire detection sensors in all compartments. Actuating one sensor will provide a high temperature alarm on the CTG control panel. Actuating a second sensor will trip the CTG, turn off ventilation, close ventilation openings, and automatically release CO2 at a design concentration adequate to extinguish the fire. The CTG and control system enclosures will be equipped with portable hand held fire extinguishers. The KRCDPP will have a fire loop with hydrants and sprinkler systems for critical equipment that can be used for supplement fire fighting and other emergencies. The MCWD will provide the water supply to the fire loop.

## 2.8 ELECTRICAL TRANSMISSION SYSTEM

### 2.8.1 Transmission Interconnection

Power will be generated by each CTG at 13.8 kilovolts (kV). Each generator is connected to a three-phase generator step up transformer that will increase the voltage to 115 kV.

The 115 kV transmission line interconnection from the KRCDPP to the PG&E Malaga Substation is approximately three-quarters of a mile in length and will be constructed, owned and operated by PG&E. The line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. Since there is an existing PG&E 12 kV distribution line running along the south side of North Avenue, the poles for this portion of the 12kV line would be replaced with new taller transmission poles to carry the new 115kV line above the 12kV line. An illustration of the standard transmission pole design that would likely be used for the transmission line is included as Figure 2.8-1.

### 2.8.2 Applicable LORS

This section provides a list of the applicable LORS that apply to the proposed KRCDPP transmission interconnection.

**General Regulations:**

- General Order 95 (GO-95) California Public Utilities Commission (CPUC)
- General Order 131-D (GO-131D) CPUC
- CPUC Decision 93-11-013

**Local:**

- Fresno County Zoning Ordinance Section 875 (Public Utilities and Services)

**Design and Construction:**

- PG&E Electric Design Standard Book 1
- PG&E Protection Design Standard Book 2
- PG&E Civil Design Standard Book 3
- PG&E Engineering Standard Book 4
- PG&E Electric Overhead Construction Manual
- PG&E Electric Underground Construction Manual
- PG&E Substation Maintenance and Construction Manual
- PG&E Substation Standards, Guidelines & Information Bulletin Handbook

**Aviation Safety:**

- Federal Aviation Regulations Part 77

**Noise** (Covered in Electrical Effects)

**Electromagnetic Fields:**

- PG&E Substation EMF Guidelines

**Hazardous Shocks:**

- PG&E Substation Maintenance and Construction Manual
- PG&E Substation Standards, Guidelines & Information Bulletin Handbook
- PG&E Electric Overhead Construction Manual

**Fire Hazard:**

- PG&E Substation Maintenance and Construction Manual
- PG&E Substation Standards, Guidelines & Information Bulletin Handbook
- PG&E Electric Overhead Construction Manual

### 2.8.3 Transmission Interconnection Studies

Interconnection of a new facility to the California Independent System Operator (CAISO) controlled grid requires the new facility owner to apply for a new generator interconnection. After processing the new generator interconnection application, the Participated Transmission Owner (PTO) generally conducts the required System Impact Study (SIS) and Facilities Study (FS). For the proposed KRCDPP the PTO is PG&E.

On May 14, 2003 KRCD filed a new generator interconnection application with the CAISO and on August 20, 2003 PG&E completed and issued the System Impact Study (SIS) report for the KRCDPP. The SIS identified the transmission system impacts caused solely by the interconnection of the KRCDPP and the system reinforcement necessary to mitigate any adverse impact of the KRCDPP under various system conditions.

To determine the system impacts caused by the addition of the KRCDPP, studies were performed using the following full loop base cases:

- 2005 Summer Peak
- 2005 Summer Off Peak
- 2005 Heavy Spring

The studies performed included:

- Steady State Power Flow
- Dynamic Stability Analysis
- System Protection

A copy of the SIS (minus the appendices) is included as Appendix 2.8-1. The SIS concluded that the addition of the KRCDPP would cause no normal or Category B contingency overloads during conditions studied for 2005. The addition of KRCDPP would increase the maximum available short circuit duty at the nearby substations by a few percent.

Dynamic Stability Study results indicated that the transmission system's transient performance, relative to the CAISO reliability guidelines, would not be impacted by the KRCDPP following selected disturbances. It is recommended that KRCDPP install Out-of-Step relay protection to guard against generator loss of synchronism condition.

On November 7, 2003 CAISO issued the Preliminary Interconnection Approval letter and concurred with the SIS report finding and granted preliminary approval to the KRCDPP.

On November 13, 2004 PG&E completed and issued the Facilities Study report, which provides cost and PG&E work scope to interconnect KRCDPP to the transmission grid.

### 2.8.4 Transmission Line Safety and Nuisance

#### *2.8.4.1 Electrical Clearances*

Typical high-voltage overhead transmission lines are composed of bare conductors connected to supporting structures by means of porcelain, glass, or plastic insulators. The air surrounding the energized conductor acts as the insulating medium. Maintaining sufficient clearances, or air space, around the conductors to protect the public and utility workers is paramount to safe operation of the line. The safety clearance required around the conductors is determined by normal operating voltages, conductor temperature, short-term abnormal voltages, wind-blown swinging conductors, contamination of the insulators, clearances for workers, and clearances for public safety. Minimum clearances are specified in the CPUC GO-95. Clearances are specified for:

- Distance between each energized conductor;
- Distance between the energized conductors and the supporting structure;

- Distance between the energized conductors and other power or communication wires on the same supporting structure, or between other power or communication wires above or below the conductors;
- Distance from the energized conductors to the ground and features such as roadways, railroads, driveways, parking lots, navigable waterways, etc.;
- Distance from the energized conductors to buildings and signs; and
- Distance from the energized conductors to other parallel power lines.

### *2.8.4.2 Electrical Effects*

**Corona Noise**

Audible transmission line noise is generated from corona discharge, which is experienced as a random crackling or hissing sound. Corona discharge occurs when particles such as dust or water droplets come into contact with a conductor, and it is this discharge that causes the crackling or buzzing sound. The potential for noise from corona discharge is greater during wet or windy weather than during dry, calm weather.

During dry, calm conditions, the sound of corona discharge is generally inaudible to a person standing directly below a transmission line. During wet or windy weather, corona noise is potentially audible within several hundred feet of the transmission lines. The actual noise is dependent upon the electric capacity of the transmission line. The sound generated by 115 kV lines during adverse weather conditions, such as fog or rain, for instance, would be less than 30 dBA directly below the transmission lines. Thus, any noise from transmission lines would be well within acceptable limits under the local noise ordinance.

**Electric and Magnetic Field Evaluation**

Electrical currents and voltages at the Malaga Substation and the transmission interconnection would generate electric and magnetic fields (EMFs). EMFs are fields of force created by electric voltage (electric fields) and by electric current (magnetic fields). Voltage on any wire produces an electric field in the area surrounding the wire. Electric field strength is described in terms of voltage per unit distance at a specified position, or at volts per meter (v/m). A magnetic field is produced from current in a conductor such as a wire. Magnetic field strength is measured in terms of lines of force per unit area (Gauss, G; or milligauss, mG). EMF's are found whenever electricity is used, such as utility lines, building wires in homes, offices, schools, and home appliances. Typical magnetic fields from these sources range from below 1.0 mG to 1,000 mG.

On November 2, 1993, the CPUC directed all publicly owned utilities in the state to take "no cost and low cost" EMF reduction steps on new and upgraded transmission,

substation, and distribution facilities. The no-cost measures are those steps taken in the design stage that will not increase the project cost, but will reduce the magnetic field strength. The low-cost measures are steps that will cost approximately 4% or less of the total project cost and will reduce the magnetic field strength in the area by 15% or more. Following the CPUC's EMF decision, PG&E prepared design guidelines for all of is substations, transmission, and distribution facilities.

PG&E will construct, own and operate the transmission interconnection facilities associated with the proposed KRCDPP. Pursuant to the EMF Decision, PG&E will prepare an EMF Field Management Plan that will identify the no-cost and low-cost EMF measures to be installed as part of the final engineering design for the KRCDPP transmission interconnection.

**Accident Electric Shock Hazards**

PG&E's existing Malaga Substation is fenced in order to restrict access to the site. Although trespassers to the site could be subject to electric shock if they encountered energized equipment, the hazard will not extend off site to the general public and the existing fencing minimizes potential exposure to electric shock hazards. Any substation upgrade work required for the KRCDPP interconnection would occur within the existing fenceline. Warning signs are also posted to alert persons of the potential electrical hazards.

The new transmission interconnection will be designed in accordance with CPUC GO-95 Guidelines for safe ground clearances that have been established to protect the public from electric shock. These precautions will minimize the risk of persons to shock hazard.

### 2.8.5 Aviation Safety

There are nine public and private airports within Fresno County, including six public airports and three private airports. Federal Aviation Regulations, Part 77, establishes standards for determining obstructions in navigable air space and sets forth notification requirements when there is a change in land use that would involve the development of any structures over 200 feet above ground level. Notification is also required if the obstruction is less than the specified height and is located within restricted air space in the approach to airports. No features associated with the KRCDPP will be above 200 feet in height.

The Fresno Chandler Downtown Airport is located 5.5 miles from the proposed KRCDPP and the Fresno-Yosemite International Airport is located approximately 10

miles from the proposed KRCDPP. No feature associated with the proposed KRCDPP will be located within restricted airport space and therefore no notification is required.

### 2.8.6 Fire Hazards

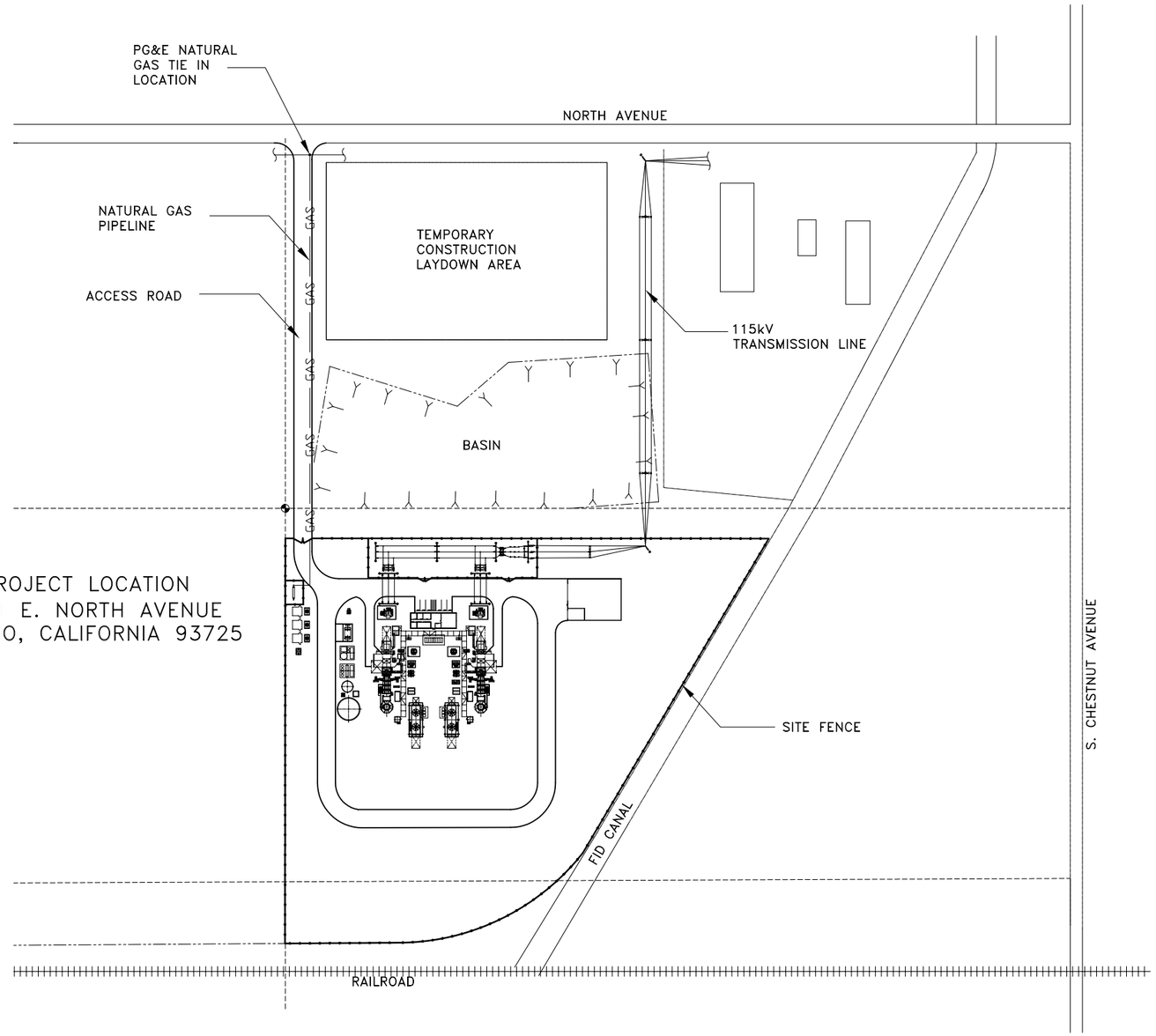
The KRCDPP transmission interconnection will be designed and constructed in accordance with applicable LORS, as previously discussed, which establish clearances and tree trimming to mitigate any potential fire hazards. The route will be kept clear of brush and other combustible materials. PG&E will provide trained and qualified maintenance personnel to maintain the route in accordance with acceptable industry practices.

## 2.9 REFERENCES

MID, 2003. Administrative Draft –Modesto Electric Generation Station Small Power Plant Exemption Application. Prepared or Modesto Irrigation District by CH2M Hill. April 14, 2003.

Pacific Gas and Electric Company Report; 1999

CPUC Decision 93-11-013 on EMF reduction




N

AREA MAP

SCALE: 1" = 100'

GRAPHIC SCALE

1" = 100'

0' 100' 200' 400'

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| C | 09/19 | ADDED BOUNDARY FENCING | CL | JD | EQ |
| B | 09/18 | REMOVED VICINITY MAP | CL | JD | EQ |
| A | 09/17 | ISSUED FOR REVIEW | CL | JD | EQ |

NAVIGANT CONSULTING

Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER

KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | CL | CL | JD |

PROJECT TITLE

KRCD
PEAKING PLANT

APPROVED

DATE

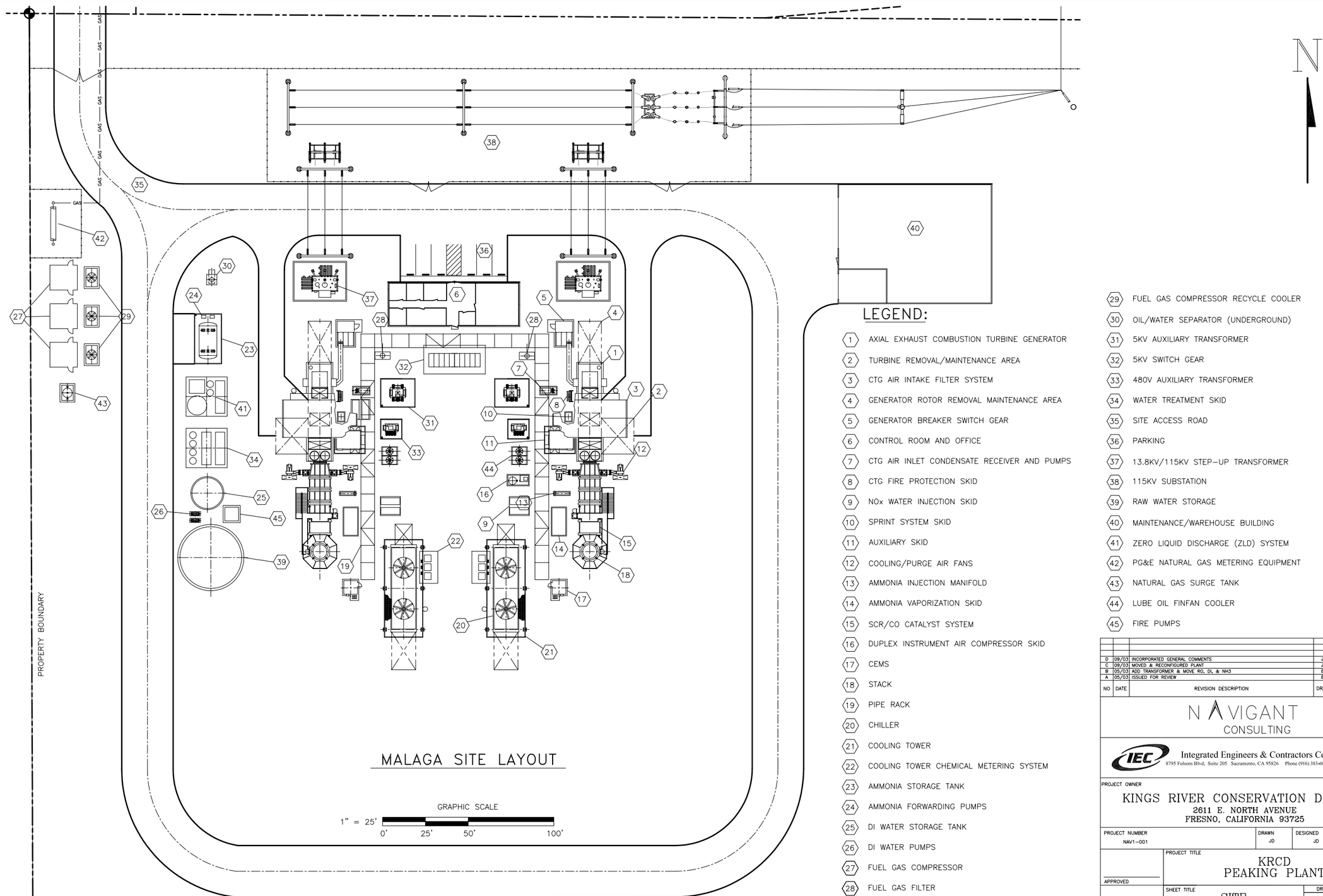
SHEET TITLE

PROJECT AREA MAP

DRAWING NO. FIGURE 2.2.1

REV. C

BORDER REVISED FEB. 12, 2003




# MALAGA SITE LAYOUT

## LEGEND:

1. AXIAL EXHAUST COMBUSTION TURBINE GENERATOR
2. TURBINE REMOVAL/MAINTENANCE AREA
3. CTG AIR INTAKE FILTER SYSTEM
4. GENERATOR ROTOR REMOVAL MAINTENANCE AREA
5. GENERATOR BREAKER SWITCH GEAR
6. CONTROL ROOM AND OFFICE
7. CTG AIR INLET CONDENSATE RECEIVER AND PUMPS
8. CTG FIRE PROTECTION SKID
9. NOx WATER INJECTION SKID
10. SPRINT SYSTEM SKID
11. AUXILIARY SKID
12. COOLING/PURGE AIR FANS
13. AMMONIA INJECTION MANIFOLD
14. AMMONIA VAPORIZATION SKID
15. SCR/CO CATALYST SYSTEM
16. DUPLEX INSTRUMENT AIR COMPRESSOR SKID
17. CEMS
18. STACK
19. PIPE RACK
20. CHILLER
21. COOLING TOWER
22. COOLING TOWER CHEMICAL METERING SYSTEM
23. AMMONIA STORAGE TANK
24. AMMONIA FORWARDING PUMPS
25. DI WATER STORAGE TANK
26. DI WATER PUMPS
27. FUEL GAS COMPRESSOR
28. FUEL GAS FILTER
29. FUEL GAS COMPRESSOR RECYCLE COOLER
30. OIL/WATER SEPARATOR (UNDERGROUND)
31. 5KV AUXILIARY TRANSFORMER
32. 5KV SWITCH GEAR
33. 480V AUXILIARY TRANSFORMER
34. WATER TREATMENT SKID
35. SITE ACCESS ROAD
36. PARKING
37. 13.8KV/115KV STEP-UP TRANSFORMER
38. 115KV SUBSTATION
39. RAW WATER STORAGE
40. MAINTENANCE/WAREHOUSE BUILDING
41. ZERO LIQUID DISCHARGE (ZLD) SYSTEM
42. PG&E NATURAL GAS METERING EQUIPMENT
43. NATURAL GAS SURGE TANK
44. LUBE OIL FINFAN COOLER
45. FIRE PUMPS

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| D | 09/03 | INCORPORATED GENERAL COMMENTS | JD | JD | EQ |
| C | 09/03 | MOVED & RECONFIGURED PLANT | JD | JD | EQ |
| B | 05/03 | ADD TRANSFORMER & MOVE RO, DI, & NH3 | BH | JD | EQ |
| A | 05/03 | ISSUED FOR REVIEW | BH | JD | EQ |

NAVIGANT CONSULTING

Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER
KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | JD | JD | EQ |

PROJECT TITLE
KRCD
PEAKING PLANT

APPROVED

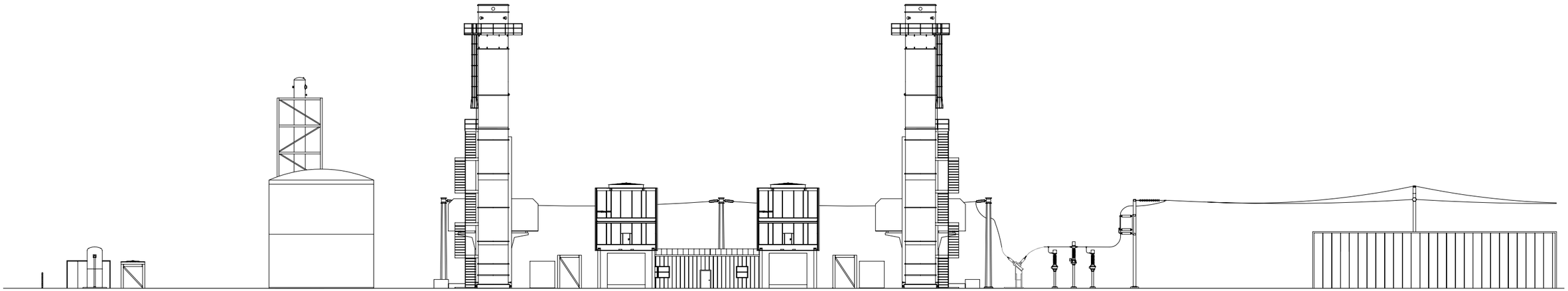
SHEET TITLE
SITE
LAYOUT

DRAWING NO. FIGURE 2.2-2

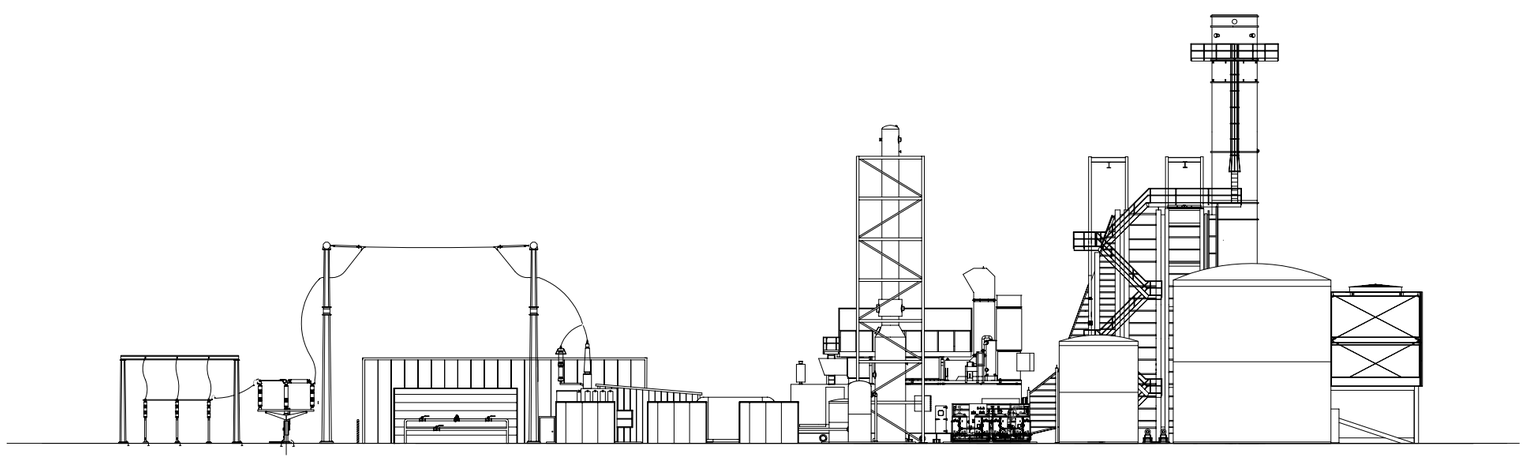
REV. D

DATE

BORDER REVISED FEB. 12, 2003



LOOKING NORTH



LOOKING EAST

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| A | 10/03 | ISSUED FOR REVIEW | CL | JD | EQ |

NAVIGANT CONSULTING

Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER

KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | JD | JD | EQ |

PROJECT TITLE

KRCD
PEAKING PLANT

APPROVED

SHEET TITLE

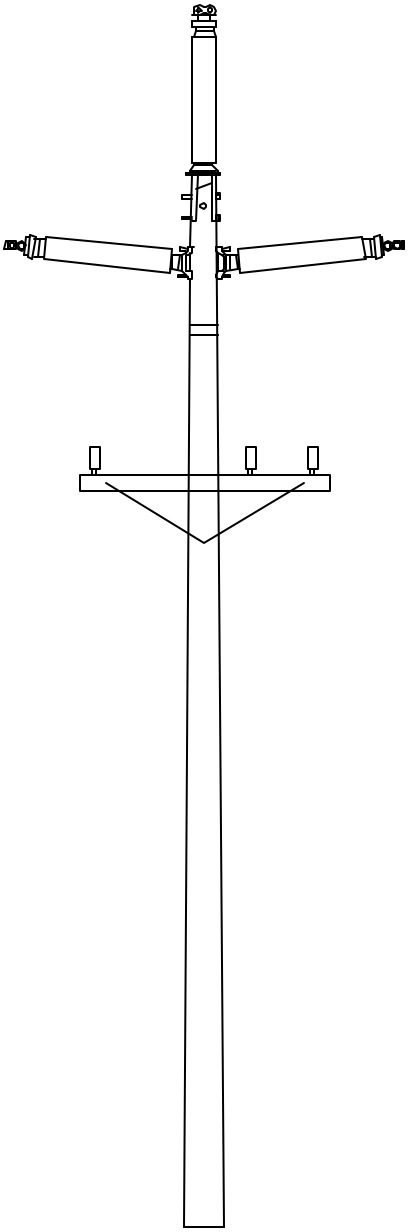
SITE
ELEVATION

DRAWING NO. FIGURE 2.2-3

REV. A

DATE

BORDER REVISED FEB. 12, 2003



T-1
115kV WOOD POLE CONSTRUCTION

FIGURE 2.8-1

Standard Transmission Pole

KRCDPP

10/17/08 REV. 0

# CHAPTER 3.0 ENGINEERING AND DESIGN CRITERIA

## 3.1 INTRODUCTION

This design criteria section is intended to provide the general guidelines for performing detailed engineering and design of the Kings River Conservation District Peaking Plant (KRCDPP). More specific project design information will be developed prior to construction during the design, engineering and procurement phase.

### 3.1.1 General Description

The KRCDPP will consist of two 49.7 megawatt (MW) gross General Electric (GE) LM6000PC Sprint model combustion turbine generators (CTGs) configured as simple cycle units. Each unit is capable of operating and producing electric power independent of the operation of the other unit.

### 3.1.2 Codes and Standards

The KRCDPP shall be designed and constructed in accordance with all federal, state and local laws, ordinances, regulations and standards (LORs) and codes including, but not limited to, the most recent applicable sections of the following LORS and codes:

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| ADA | Americans with Disabilities Act |
| AFBMA | Anti-Friction Bearing Manufacturers Association |
| AGA | American Gas Association |
| AGMA | American Gear Manufacturers Association |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AMCA | Air Movement and Control Association |
| ANSI | American National Standards Institute |
| API | American Petroleum Institute |
| ARI | Air-Conditioning and Refrigeration Institute |
| ASCE | American Society of Civil Engineers |
| ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASNT | American Society for Nondestructive Testing |
| ASTM | American Society for Testing and Materials |
| AWS | American Welding Society |

| | |
|---|---|
| AWWA | American Water Works Association |
| CBC | California Building Code |
| CMAA | Crane Manufacturers Association of America |
| CRSI | Concrete Reinforcing Steel Institute |
| CTI | Cooling Tower Institute |
| EIA | Electronic Industry Association |
| EJMA | Expansion Joint Manufacturing Association |
| FM | Factory Mutual |
| HEI | Heat Exchange Institute |
| HIS | Hydraulic Institute Standards |
| IEEE | Institute of Electrical and Electronics Engineers |
| IES | Illuminating Engineering Society of North America |
| ISA | The Instrumentation, Systems, and Automation Society |
| ICEA | Insulated Cable Engineers Association |
| ISO | International Standards Organization |
| MBMA | Metal Building Manufacturers Association |
| MSS | Manufacturers Standardization Society of Valves and Fittings Industry |
| NAAMM | National Association of Architectural Metals Manufacturers |
| NACE | National Association of Corrosion Engineers |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NFPA 101 | NFPA Life Safety Code |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturers Association |
| OSHA | Occupational Safety and Health Administration |
| PCI | Prestressed Concrete Institute |
| PFI | Pipe Fabrication Institute |
| SAMA | Scientific Apparatus Makers Association |
| SFC | State Fire Code |
| SMACCNA | Sheet Metal and Air Conditioning Contractor's National Association |
| SSPC | Steel Structures Painting Council |
| TEMA | Tubular Exchanger Manufacturer Association |
| UBC | Uniform Building Code |
| UL | Underwriters Laboratory |
| VDEW | Acceptance and Performance Test of Air Cooled Condenser |

In the event conflicts arise between these LORS and codes described herein, and the LORS and codes, of Fresno County, the more stringent code shall apply.

## 3.2 SITE DESIGN DATA

Table 3-2-1 summarizes KRCDPP site design elements.

| Table 3-2-1<br>Site Design Elements<br>KRCDPP | |
|---|---|
| Project Location | Community of Malaga,<br>Fresno County, California |
| Site Elevation above Sea Level | 292 Feet |
| Design Temperature Range | 25 to 103 degrees Fahrenheit (°F) |
| Average Annual Temperature | 63 °F |
| Relative Humidity Range | 5 to 100 % |
| Average Annual Rainfall | 11.23 inches |
| Historic Rainfall (Fresno Air Terminal) | 8.56 inches (1969)<br>21.61 (1983) |
| Design Wind Speed | Exposure C |
| Seismic Design Zone | 3 |
| Design Life | 30 years |

## 3.3 GENERAL DESIGN CRITERIA

The KRCDPP will be designed to allow operation throughout the year at maximum output over the entire design temperature range. The air permit will restrict total operating time to 2500 hours per year plus time required for startup and shutdown. The KRCDPP will be designed to:

- Provide maximum output during all operating conditions.
- Provide levels of efficiency and reliability that exceed the requirements of the Power Purchase Agreement (see Chapter 1, Executive Summary).
- Operate at full load (i.e. not part-load).
- Operate with high cycle duty (start/stop).
- Achieve full load operation within 10 minutes from a cold start condition.
- Be capable of providing spinning reserve and non-spinning reserve services. There are no allowances for automatic generator control (AGC) or blackstart capabilities.
- Be capable of remote, unattended start.
- Be capable of unattended operations. Operations staff, if not on site, will be dispatched to the KRCDPP upon notice of operations.

## 3.4 KRCDPP EMISSIONS DESIGN BASIS

### 3.4.1 Nitrous Oxide Control

The KRCDPP will be designed for water injection into the combustion turbines at a rate that will result in nominal nitrogen oxide (NOx) emissions of 25 parts per million by volume, dry (ppmvd) corrected to 15 percent oxygen (@ 15 percent Oxygen (O2)) at the combustion turbine exhaust during full load operation and natural gas firing.

In addition, the KRCDPP will be equipped with a highly efficient Selective Catalytic Reduction (SCR) system that will further reduce NOx emissions. The SCR system will be designed to reduce and maintain the emissions of NOx from the CTG exhaust gases below the air permit requirements.

The system will be designed as follows:

- CTG exhaust NOx prior to SCR catalyst will be 25 ppmvd corrected to 15 percent O2.
- Stack NOx will be 3.0 ppmvd corrected to 15 percent O2.
- SCR system will use 29 percent aqueous ammonia.
- Ammonia slip at the stack will be 10 ppmvd corrected to15 percent O2.
- An ammonia air dilution skid will be provided with electric vaporizer and dilution air fans.
- Ammonia injection grid will be provided.
- Ammonia balance skid (with tunable flow control valves and local indicating flow gauges on each header) will be provided.
- Flue gas cooling air fans to protect the catalyst systems from high temperature will be provided.
- SCR catalyst modules with provisions for periodic replacement will be provided.
- Provisions for additional space for future installation of one row of catalyst will be provided.

### 3.4.2 Carbon Monoxide and Reactive Organic Compounds Control

The CTGs will be equipped with high efficiency combustors that will minimize the formation of carbon monoxide (CO) and reactive organic compounds (ROCs). In addition, the KRCDPP will be equipped with an oxidation catalyst system. The CO catalyst system will be designed to oxidize CO emissions from the CTG exhaust gases and maintain these emissions below the air permit limits.

The system design will be as follows:

- Maximum CTG exhaust CO level will be 49 ppmvd corrected to 15 percent O2.
- Stack CO emissions will be 6 ppmvd corrected to 15 percent O2.

The system will consist of a catalyst bed located within the CTG exhaust ductwork and upstream of the SCR system.

### 3.4.3 Continuous Emission Monitoring System

The continuous emission monitoring system (CEMS) will provide analysis and documentation for compliance of emissions monitoring for NOx, CO, and O2 parameters. A CEMS system will be provided for each CTG and located next to each exhaust stack. A walk-in enclosure with monitoring station will be provided at the exhaust stack. This enclosure contains the sampling trains and monitoring instruments for analyzing the exhaust gas samples from the CTG exhaust stack. System accuracy will be in accordance with United States Environmental Protection Agency (USEPA) and air permit requirements.

The analyzer data along with fuel measurements shall be transmitted to a CEM Data Acquisition System (DAS) workstation located in the control room, where calculations will be performed that will determine and record compliance with emissions controls and regulations. Reports will be generated in a format approved by the local Air District and USEPA.

An emission level signal will be provided from the CEMS system to the KRCDPP control system for NOx trim and SCR system control.

## 3.5 MECHANICAL EQUIPMENT DESIGN

A service life of 30 years will be used as the basis for KRCDPP and equipment design. Equipment or components for which a 30-year life expectancy cannot be reasonably assured will be designed and installed to allow safe and convenient replacement.

The guaranteed operating point for major equipment will be selected at the CTG base load rating corresponding to a summer ambient temperature of 103 °F and 24 percent relative humidity (RH), with the CTG inlet air chilled to 48 °F, and water injection for NOx control to 25 ppmvd @ 15 percent O2. The power block equipment, as well as the balance of the KRCDPP equipment, will be designed to meet the maximum operation conditions and requirements for each specific component or system.

### 3.5.1 Combustion Turbine Generator

The CTGs will each be GE LM6000PC Sprint aircraft-derivative type, water-injected for NOx control and power boost, and designed to operate on natural gas fuel.

Each CTG is designed for continuous full-load operation, with a 5-inch water column inlet loss and 10-inch water column exhaust loss, at 103 °F and 24 percent RH ambient conditions, with inlet chilling to 48°F.

#### *3.5.1.1 CTG Electrical System*

The CTG electrical system includes the following:

- A 13.8 kilovolt (kV), 3-phase, 60 Hertz (Hz), 71-million volt amperes (MVA) @ 59°F air cooled, 3600-revolutions per minute (rpm) direct drive generator, capable of operating at a Power Factor down to 0.85.with class F insulation and a Class B temperature rise,
- A low maintenance brushless excitation system, including automatic voltage regulator, power factor control system, and voltage control system,
- Neutral and line-side cubicles with current transformers, surge protection capacitors, lightning arrestors, and neutral grounding transformer with secondary side resistor,
- A generator circuit breaker,
- A protective relay system, and
- A Direct Current (DC) auxiliary power system, including a 24-volt battery system and solid-state automatic battery chargers for operation of the CTG control system and fire protection system.

In addition, the CTG package will include all auxiliary motors, controls, control panels, motor control centers, internal wiring, and protective monitoring and alarm equipment required for the proper operation of the CTG.

#### *3.5.1.2 CTG Inlet Air Filtration/Silencing System*

Each CTG will include a multistage inlet air filtration/silencing system designed to protect the CTG from the effects of airborne dust and dirt, achieve optimum system performance with minimum maintenance requirements, and meet operational and system criteria. The filtration system consists of weather hoods, protective screens, pre filter and final barrier filter.

The inlet air system will also include:

- An intake air silencer to limit equipment noise level below 85 decibels at 3 feet,
- An inlet air chilling coil,
- A self-contained air inlet heating system for anti-icing protection, and
- A clean air plenum, ducting, inlet air volute, structural supports, platforms, and ladders. The filter housing will have service doors and internal lighting. The filter housing and supports shall be constructed of steel and coated with protective paint.

#### *3.5.1.3 CTG Inlet Air Chilling and Heating System*

Each CTG will be provided with an inlet air chilling system for summertime power augmentation. The chilling system will use mechanical chillers with associated packaged cooling towers, closed cooling water loop and an inlet air heat exchanger.

Each CTG chiller will be rated at approximately 1,800 tons of refrigeration. The chillers will use either R123 or R134a, which are considered chlorofluorocarbon (CFC) free refrigerants. A chilled water loop will deliver water from the chillers to the inlet air heat exchanger. The water-cooling tower will be utilized for rejecting the waste heat from the chillers.

Each chiller cooling tower will have chemical feed system designed to inject controlled amounts of water treatment chemicals into the water system to control biological growth and to achieve optimum water chemistry, maintain system performance, and prolong equipment life. Each system will include the following chemical additives:

- Bromine will be added to control biological growth in the cooling tower,
- Sulfuric acid will be added to control pH,
- A dispersant chemical will be added to control scale formation, and
- Phosphate will be added to control corrosion.

Each chiller chemical feed system will consist of small chemical storage tanks and positive displacement metering pumps. The CTG inlet air heating system for winter anti-icing protection (when turbine inlet temperatures are below 40°F) is composed of a self-contained heating system using waste heat from the turbine exhaust (Higgot Kane system).

#### *3.5.1.4 CTG Enclosure*

A weatherproof acoustical enclosure will be provided for each CTG to protect the CTG and meet the permitted noise limits. The enclosure shall be coated with protective paint.

Each CTG enclosure will be fully ventilated. The enclosure will be equipped with suitable lighting, access doors, and removable panels to facilitate turbine inspection and maintenance. To prevent any fuel from leaking from the turbine enclosure, a negative pressure shall be maintained in the CTG compartment during normal operation.

Stairs and access platforms will be required around the enclosure for safe and easy access to the CTG package. The platforms will be removable if necessary to gain access in the CTG removal area.

#### *3.5.1.5 CTG Fuel Systems and Water Injection System*

Each CTG will be designed to operate on natural gas fuel with water injection for NOx control. The fuel system will be designed to automatically control the fuel supply to the CTG at any power level or operating condition. The fuel system will consist of a pressure-regulating valve, fuel control valve, shut-off valves, and instrumentation.

The water injection system will automatically control the combustor nozzle NOx water injection rate. The system will include a fuel strainer, flow meter, primary shutoff valve, fuel metering valve, secondary shut-off valve, and instrumentation.

#### *3.5.1.6 CTG Starting System*

Each CTG will be equipped with an electro-hydraulic starting system consisting of an electric-motor-driven variable displacement hydraulic pump, a hydraulic oil reservoir, air/oil cooler and filter. The system will be designed to crank the engine to achieve the required purge cycle durations of the SCR/CO catalyst ducting, and off-line water wash operations. Each CTG starting motor is rated at 200 horsepower (hp). The KRCDPP will not include a standby generator for black starting the CTG.

#### *3.5.1.7 CTG Lubricating Oil Systems*

Separate lubricating oil systems shall be provided for the combustion turbine and for the generator. The combustion turbine lube oil system will provide clean and cool lubricating oil to the combustion turbine bearings, accessory drive gears, and shaft splines. The system will include a lube oil reservoir, a shaft-driven lube oil pump and backup direct-current motor-driven lube-oil pump, scavenge pump, duplex filters, fin/fan cooler with duplex fan and motor, and all interconnecting piping, strainers, valves, controls, and instrumentation.

The generator lube oil system will provide clean and cool lubricating oil to the generator bearings. The system will include a lube oil reservoir, a main lube oil pump, direct current auxiliary pre/post lube oil pumps or gravity rundown system, duplex filters, fin/fan cooler with duplex fan and motor, and all the required interconnecting piping, strainers, valves, controls, and instrumentation. All lube oil piping, strainers, coolers, and reservoirs will be of stainless steel construction.

#### *3.5.1.8 CTG Fire Detection and Protection System*

Each CTG enclosure will be equipped with a complete and automatic CO2 fire detection and protection system that includes optical flame detectors, hydrocarbon sensing, and thermal detectors in both the turbine and generator compartments. In addition, the system will also include an automatic fire extinguishing system.

#### *3.5.1.9 CTG Controls*

The CTG will be provided complete with a vendor-packaged and integrated control system that provides for automatic and manual start-up, synchronizing, loading and unloading, protection, and shutdown of the CTG system. Information on the status of the CTG will be displayed in the control room and allow for operator interface. The control system will include process alarms, trending and data storage.

#### *3.5.1.10 CTG Water Wash System*

The system will be fully automatic and designed to allow on-line and off-line cleaning of the CTG compressor section. The system consists of a fluid reservoir, pump, piping, valves, and controls.

### 3.5.2 Demineralized Water Treatment System

The KRCDPP will be provided with a complete demineralized water treatment system designed to provide demineralized water for CTG NOx and Sprint injection. It is anticipated that the following equipment will be required as part of the demineralized water treatment system:

- Filtration upstream of the reverse osmosis (RO) system,
- RO system,
- Electro deionization (EDI) system to produce the demineralized-quality water,
- Wastewater storage tank,
- Demineralized water storage tank,
- Anti scalant chemical injection upstream of RO equipment,
- Sodium bisulfite chemical injection upstream of RO equipment, and

- Acid/caustic chemical injection upstream of RO equipment.

The demineralized water storage tank will have a capacity of approximately 200,000 gallons and will allow for 24 hours of KRCDPP operation in the event the demineralized water treatment system is out of service. The wastewater water storage tank will have a capacity of approximately 80,000 gallons and will also allow for 24 hours of KRCDPP operation in the event the ZLD system is out of service.

### 3.5.3 Fuel Gas System

Natural gas will be delivered to the KRCDPP metering station at a nominal pressure of 200 to 500 pounds per square inch in gage (psig). The fuel gas system will be designed to deliver and condition the fuel gas to the CTGs at the required flow, pressure, and quality over the entire KRCDPP operating range and over the full range of expected gas supply pressures. The LM6000 CTGs require a fuel pressure of approximately 675 psig. Therefore, the KRCDPP will be provided with three gas compressors. Each gas compressor will be sized to meet the gas flow requirement of one CTG. Normally, two gas compressors will be required to operate with the third compressor provided as a standby unit. The compressors will be equipped with gas pressure unloading systems to allow for more efficient operations when the inlet gas pressure exceeds 200 psig. The gas compressor system equipment will be air-cooled.

### 3.5.4 Fire Protection System

The fire protection system will be designed to provide personnel safety and protection through prompt detection, alarm, and suppression of a fire. The system will be designed in accordance with all applicable National Fire Protection Association (NFPA) codes and standards, and state and local LORS regulations and will include the following elements:

- County-approved fire hydrants will be located throughout the KRCDPP project site near service roads. The maximum distance between hydrants shall be in accordance with local fire department requirements.
- Automatic, pre-action type sprinkler systems will be provided in the electrical building electrical equipment rooms.
- Wet pipe sprinkler systems will be used in office areas and warehouse storage areas.
- A self-contained CO2 fire detection and protection system will be provided for each CTG enclosure.
- Automatic deluge systems activated by heat detectors will be provided for the generator lube oil skids.

- Portable fire extinguishers will be provided within buildings and at key locations throughout the KRCDPP.
- A fire alarm panel, located in the control room, will provide visual indication and audible alarm of any fire detected in the plant, including a fire in the CTG enclosures, fire water flow to any sprinkler system, and deluge system activation.
- System supervisory and trouble status alarms shall be provided through the KRCDPP control system.

### 3.5.5 Service and Potable Water System

The service water system will be designed to supply water for KRCDPP services such as floor and equipment wash-down and for miscellaneous uses. The system will consist of a main header with branches to feed utility stations conveniently located throughout the KRCDPP.

The potable water system will be designed to supply water for buildings and for emergency eyewash and safety showers located wherever hazardous chemicals are stored or handled. Emergency safety shower and eyewash stations will use tempered water in accordance with Occupational Safety and Health Administration (OSHA) recommendations.

### 3.5.6 Service and Instrument Air System

The service and instrument air system will consist of two 100-percent-capacity, air-cooled, oil-free air compressors that will satisfy all instrument and service air requirements for the KRCDPP. The air compressors will discharge into a single air receiver that will serve both the service and the instrument air systems.

The service and instrument air compressor system will include dual air filters and redundant, heatless, desiccant-type air dryers. Both instrument air and service air will be dry and oil-free. The instrument air system will feed all pneumatic control devices including the CTGs. The service air system will feed all utility stations throughout the KRCDPP.

### 3.5.7 Wastewater Treatment System

KRCD is proposing to use a ZLD system to treat process wastewater and thus eliminate process wastewater discharge from the KRCDPP. The primary sources of process wastewater are reject water from the RO system and cooling tower blowdown from the inlet air chiller system. KRCD is currently considering two onsite ZLD technologies and one offsite ZLD technology. Final selection of the ZLD system will depend on a cost and

reliability analysis provided during the final design process. The following is a brief description of each of the ZLD options that KRCD is considering:

**Option 1 – ZLD Reverse Osmosis/Brine Concentrator/Spray Dryer**

This ZLD option consists of a RO system, a brine concentrator and an electric air-heated spray dryer. The process would involve sending raw water through the RO system to generate de-ionized (DI) water. The DI water would be sent to a 200,000 gallon water tank, while the wastewater streams from the RO reject water and the RO multi-media filter backwash water would be sent to an 80,000 gallon wastewater storage tank.

The wastewater from the wastewater storage tank would be sent to a brine concentrator spray dryer system for processing. The brine concentrator process involves concentrating and evaporating wastewater from the KRCDPP. Recovered distillate (pure water) from the brine concentrator would be sent back to a small storage tank for reuse as makeup water. The small amount of highly concentrated brine solution, which represents the only process wastewater stream not reclaimed for reuse, would be sent to an electrically heated spray dryer system where it would be evaporated, leaving a dry solid suitable for landfill disposal. Figure 3.5-1 is a schematic of the water balance using an onsite ZLD water treatment system.

**Option 2 – ZLD High Efficiency Reverse Osmosis / Crystallizer**

This ZLD option utilizes a conventional water softener, and a high efficiency RO system, followed by a final crystallizer. The process involves sending raw water to a water softener system upstream of the RO system to remove hardness and alkalinity. This pre-treatment process essentially increases the overall efficiency of the RO process, which results in smaller quantities of wastewater compared to Option 1. The DI water would be sent to a 200,000 gallon water tank, while the wastewater would be sent to an 80,000 gallon wastewater tank and then to a ZLD final crystallizer. The ZLD final crystallizer process generates a highly concentrated liquid brine waste that is trucked off-site for disposal.

**Option 3 – ZLD Off-Site Regeneration**

In this ZLD option, raw water would be sent to a mobile ion exchange resin bed trailer to produce DI water. No RO system or other onsite permanent water treatment systems are required for this option. When a resin bed trailer is due for regeneration, it would be trucked off and replaced with a recharged resin bed trailer. The KRCDPP would have a minimum of two resin bed trailers on-site at all times to maintain reliability for uninterrupted water treatment service. The DI water would be sent to a 200,000 gallon storage tank. Because the resin beds are regenerated offsite, this option does not require

a wastewater tank. Figure 3.5-2 is a schematic of the water balance using an offsite ZLD water treatment system.

### 3.5.8 Heating, Ventilating, and Air-Conditioning Systems

The control building, including the control room, electrical switchgear room, battery room, and office spaces, will be provided with Heating, Ventilating, and Air-Conditioning Systems (HVAC) systems as necessary for equipment protection and personnel comfort. The water treatment building will be provided with heating and ventilation systems only.

## 3.6 PIPING

### 3.6.1 Piping Codes and Standards

All process piping will be designed and constructed in accordance with all applicable codes and standards.

### 3.6.2 Piping Material and Design

Piping materials will be selected on the basis of suitability with the fluids being handled and for the complete range of operating pressures and temperatures expected.

Non-metallic piping systems will be used where possible for underground portions of low pressure, low-temperature systems including drains, service and potable water systems, cooling water, and fire protection system. Non-metallic piping used for fire protection service will be listed by Underwriters Laboratories (UL) and/or approved by the Fire Marshal (FM). Underground metallic piping will be suitably protected from corrosion by coating and wrapping and through the use of a passive-type cathodic protection system.

### 3.6.3 Piping Insulation

Thermal insulation of piping systems for energy conservation will be provided where necessary. Insulation for personnel protection will meet applicable OSHA requirements for maximum exterior casing temperatures and will be specified for all equipment within personnel access or reach that is not insulated for energy conservation. Maximum temperature of surfaces will not exceed 140°F.

Electric heat tracing will be specified for piping systems or portions of piping systems 2-inches nominal pipe size and smaller which are exposed to outdoor conditions and could experience loss of service due to freezing.

### 3.6.4 Pipe Supports

Piping design and pipe supports will be designed in accordance with all applicable codes. Supporting elements will be capable of carrying the sum of all concurrently acting loads

such as: pipe and fluid weight, operating loads, wind, seismic, etc., and allow pipe thermal expansion and contraction without causing overstress.

## 3.7 VALVES

Valve selection will be based on the required function, material, and pressure rating of the piping system, and the size of the pipe and the piping fluid. Valve type will be selected based on operational and maintenance considerations as well as good engineering practice.

## 3.8 INSTRUMENTATION AND CONTROLS

### 3.8.1 Control System Design

The instrumentation and control system will be designed to allow the operators to achieve safe and reliable operation of the KRCDPP. Major equipment monitoring, control, and operation will be provided from the control room using the plant control system (PCS). The integration of the various lower level systems will be accomplished by the PCS. The PCS will be used for supervisory control and monitoring of major components and package systems, such as the CTGs, and it will be used for direct control of SCR control loops and other balance-of-plant equipment and processes.

A full-function operator workstation will be located at the KRCD Pine Flat Power Plant, which is manned on a 24 hours per day, seven days per week basis[1]. From the Pine Flat Power Plant, monitoring of the CTGs and full control and monitoring of the balance-of-plant equipment will be possible.

## 3.9 INSTRUMENTATION

KRCDPP instrumentation and control equipment will be of a proven design and chosen to ensure a high-level of reliability. When redundant controls are required, completely separate devices with individual sensing taps and isolation capability will be provided.

## 3.10 CONTROL ROOM

The control room will be located in the electrical building. It will contain CTG interface devices, CTG control panels, the fire alarm panel, the CEMS interface equipment, and other communications and monitoring equipment.

[1] KRCD owns and operates the Pine Flat Power Plant, located at the base of the Pine Flat Dam, which is the dividing point between Upper and Lower Kings River and approximately 25 miles east of Fresno. The plant harnesses the power of the river by using irrigation and flood releases from Pine Flat Reservoir to generate electricity. The Pine Flat Dam is operated by the U.S. Army Corps of Engineers.

## 3.11 ELECTRICAL

### 3.11.1 General Design

This section covers criteria for the design of the electrical auxiliary power systems used in conjunction with the CTGs and support equipment to be installed at KRCDPP and integrated into the Pacific Gas and Electric (PG&E) electrical network.

The complete electrical system will be economically designed for reliability of service, safety of personnel and equipment, ease of maintenance and operation, minimum power losses, and mechanical protection. The electrical system includes provision for the addition of future loads, and maximum interchangeability of equipment. Voltage insulation levels, interrupting and continuous current capacities, circuit protection, and mechanical strengths of all equipment shall be selected and coordinated in accordance with good practice.

Electrical system protective devices (relays, fuses, circuit breakers, etc.) shall be selected and coordinated to ensure that the circuit protective device nearest the point of fault (or high overcurrent) will open first (selective tripping) to minimize equipment damage and disturbances to the remainder of the system.

### 3.11.2 Auxiliary Electrical Design

Power for the station electrical auxiliary loads is provided through two 13.8 to 4.16-kV auxiliary transformers, each connected at the output of one of the CTGs. Each auxiliary transformer will be energized from the 115-kV bus through its respective generator step-up (GSU) transformer when the generator circuit breaker is open during start-up or trip, and periods when unit is not operating. Each of the auxiliary transformers is sized to accommodate all auxiliary system loads associated with the entire station, including common station loads. Therefore, the two auxiliary busses can be interconnected through a 4.16kV breaker such that one CTG and transformer can provide startup power to the other. During normal operation, the auxiliary system loads of either CTG are supplied by the auxiliary transformer connected to the CTG. For the basic configuration of the auxiliary system for each of the CTGs, see the KRCDPP One-Line Diagrams, which are included as Figures 3.11-1 and 3.11-2.

### 3.11.3 Transmission Design

Power will be generated by each CTG at 13.8kV. Each generator is connected to a three-phase generator step up transformer that will increase the voltage to 115 kV. A generator breaker will be located between the generator and transformer to provide synchronizing and trip control of the generator. Each transformer will be set on a concrete pad with containment of the transformer oil in the event of a leak or spill. The high side of the

transformers will be connected to a single high voltage breaker and then to the PG&E Malaga Substation where there will be another set of high voltage breakers. The transmission line from the KRCDPP to the Malaga Substation is approximately one-half mile in length and will be constructed, owned and operated by PG&E. As described in Chapter 2, Project and Facility Description, the interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue between Chestnut and Willow Avenues. The poles for this portion of the 12kV line will be upgraded with new taller transmission poles, which will carry the new 115kV line above the 12kV line.

### 3.11.4 Generator Step-Up Transformers

Two generator step-up transformers will be provided, one for the output of each turbine generator. The generator step-up transformers will be three-phase, oil-filled, rated 39/52/65 MVA @ 65°C rise, with Oil and Air/Forced Air/Forced Air (OA/FA/FA) cooling. A power system stabilizer (PSS) will be provided to enhance the performance of the electric generator and excitation system.

### 3.11.5 Auxiliary Transformers

Two 13.8 to 4.16-kV auxiliary transformers will provide power to the 4.16-kV system. The transformers will be located outdoors with the low voltage windings connected to one section of the 4.16-kV switchgear via 5-kV, shielded, single-conductor cable with 133 percent insulation, run in an underground conduit duct bank.

The high-voltage windings will be connected to the 13.8-kV CTG metal clad switchgear via 15-kV, shielded, single-conductor cable with 133 percent insulation, run in an underground conduit duct bank.

### 3.11.6 Switchgear13.8 kV

Outdoor, metal-clad 13.8 kV switchgear shall be provided to accept power from the generators and interconnect with the GSU and auxiliary transformers. Each breaker may be tripped automatically or manually and will serve to synchronize the generator to the grid.

### 3.11.7 Switchgear 4.16 kV

Indoor metal-clad 4.16 kV switchgear shall be fed from the 4.16 kV auxiliary transformers. The buses and incoming circuit breakers of both 4.16-kV switchgear sections will be sized

to handle the total auxiliary load of the KRCDPP. Each 4.16-kV breaker may be manually tripped.

### 3.11.8 Station Service Transformers

Two 4.16-0.48 kV station service transformers will provide power to the 480 volt (V) system. The transformers will be located outdoors and each is connected to one section of the 480 V switchgear.

### 3.11.9 Grounding System

The station grounding system shall consist of a network of buried, bare, stranded copper cables installed around the perimeter of the station site, the generators, the generator step-up, auxiliary, and station service transformers, the outdoor metal clad switchgear and buildings associated with the KRCDPP. The grounding network shall consist of the underground grounding grid, grounding electrodes, equipment-grounding conductors, crushed rock at grade level and above-grade equipment and structure-grounding connections.

A separate, isolated, insulated, high-quality grounding system shall be provided at the control room for instruments and computers only. Equipment located remotely from the main grounding network shall be grounded by means of individual grounding conductors and grounding electrodes.

### 3.11.10 Cathodic Protection

Passive type cathodic protection systems will be used where practical for underground metallic piping or equipment. Insulating flanges will be installed to electrically isolate underground pipes from above-grade grounded piping and structures. Non-metallic piping will be used where possible for the underground piping system to minimize the need for cathodic protection systems.

### 3.11.11 Direct Current and Uninterruptible Power Supply Systems

The station 125 V DC and 120 Voltage Alternating Current (VAC) uninterruptible power supply (UPS) systems shall be sized to accommodate the requirements of all balance-of-plant systems supporting the generators. The turbine generators are equipped with a 24 V battery system for their own control and fire protection systems. The station 125 V batteries will be sized to accommodate all other normal and emergency DC loads including the 120 VAC UPS. The station battery and the batteries for the CTGs may be installed in a separate battery room. Two battery eliminator type chargers will be provided for the station 125 V batteries.

The station 125 Voltage Direct Current (VDC) and 120 VAC UPS systems shall consist of the following items located in the air conditioned electrical building areas: a solid state inverter, an automatic static transfer switch, two battery chargers, 125 VDC switchboard/distribution panel, 120 VAC UPS bypass transformer (regulated type), and 120 VAC UPS distribution panel. These systems shall supply all normal power loads and emergency power necessary for orderly shutdown of the CTGs and shall maintain emergency power to the control system for a minimum of 60 minutes. The 125 VDC and 120 VAC UPS systems shall also supply power for instruments and switchgear control. Emergency lighting units are not fed from the station battery.

### 3.11.12 Paging and Communication System

An intra-plant telephone and public address (PA) system shall be provided and shall tie into the local telephone service. The new speakers and phones will be installed at selected locations throughout the KRCDPP. Outdoor units will have weatherproof, sound reduction housings.

Telephone cabling, pull boxes, and associated conduit runs will be provided from the control room to phones at selected locations, and a Private Branch Exchange (PBX) and telephone backboard shall be installed in the electrical building with a trunk line to the point of telephone service interconnection with the local telephone company (SBC Communications).

### 3.11.13 Lighting

Station lighting will be designed to provide unobstructed illumination in all buildings and along all walkways, in general areas, on roadways, and around building perimeters. Lighting fixtures will be located to provide uniform illumination. Outdoor light fixtures shall be selected, mounted, and positioned to prevent unnecessary illumination of the night sky, and to avoid light trespass, or light source visibility from adjacent properties.

High-pressure sodium fixtures will be used for all outdoor areas and in the combustion turbine room. Except for the turbine room, fluorescent light fixtures will be used in indoor areas. All outdoor lighting will be controlled by photocell or from locally mounted switches.

Emergency lighting will be provided in the electrical building and other areas determined to be critical to the KRCDPP. This lighting will consist of wall- or ceiling-mounted dual seal beam (battery pack) fixtures and lighted exit signs, and will be suitable for 90 minutes of operation. Lighting panel boards will be used for the control of lighting, convenience receptacles, single-phase motors, and other similar loads.

### 3.11.14 Power Wiring

Electric conductors will be selected with an insulation level applicable to the system voltage for which they are used and ampacities suitable the load being served. The maximum ampacities for any cable will be determined in accordance with the National Electric Code and depend upon the worst case in which the cable will be routed (tray, conduit, duct, or direct buried). In addition, to ampacity, special requirements such as voltage drop, fault current availability and environment will be taken into consideration in sizing of cable.

## 3.12 CIVIL SITE WORK DESIGN

### 3.12.1 General

Civil design will be in accordance with the latest California Department of Transportation (Caltrans) design and specification standards.

### 3.12.2 Earth Work

Earthwork will include clearing, grubbing, and stripping where necessary, excavation of soils for structures and foundations, development of cut and fill slopes, and trenching for a storm drainage system, as required.

Earthwork will be designed in accordance with the recommendations given in the site-specific geotechnical report, which will be completed prior to construction activities. Erosion and sedimentation control will be provided to retain sediment on site and to prevent violation of water quality standards.

### 3.12.3 Grading Design

The entire KRCDPP site will be graded, and if necessary, provided with supplementary catch basins to provide adequate drainage. Finish grades will conform to minimum drainage gradient standards. Additional information on grading, as well as the KRCDPP preliminary site grading and drainage plan, is provided in the draft Construction Storm Water Pollution Prevention Plan, which is included as Section 5.3, Water Resources - Appendix 5.3-2.

### 3.12.4 Storm Drainage Design

The site grading and drainage system will be designed to comply with all applicable federal, state and local LORS. The general site grading will establish a working surface for construction and operating areas, provide positive drainage from buildings and structures, and provide adequate soil coverage for underground utilities.

The project site will primarily be covered with concrete paving, with some areas surfaced with crushed rock. Storm water from paved areas will be routed to catch basins. Storm water will naturally percolate within the graveled areas with excess water collected and sent to the existing storm water basin located adjacent to the project site to the north.

Equipment areas such as lube oil storage areas and chemical storage areas will be provided with secondary containment to prevent contaminated storm water from entering storm water system. Off-site storm drainage from adjacent properties will be prevented from entering the KRCDPP site, and vice versa. Site drainage facilities will be designed to prevent flooding of permanent facilities resulting from a 100-year, 24 hour rainfall.

### 3.12.5 Oily Water

Oil-contaminated storm water resulting from equipment leakage, routine equipment maintenance, and oil-contaminated area wash down activities will be directed into the KRCDPP oil water separator prior to discharging into the KRCDPP's storm water system.

### 3.12.6 Road and Pavement

The access roads to the KRCDPP shall be a minimum of 20 feet wide with a turning radius of 30 feet inside and 50 feet outside and capable of sustaining a 40-ton axle load. Roads shall be crowned with a 2 percent slope minimum. Access roads, maintenance, and parking areas shall be paved. All edges of the traveled way shall be defined with painted lines. Roadways shall not have painted centerlines.

## 3.13 STRUCTURE DESIGN

The design and specification of work shall be in accordance with all applicable federal, state, and local LORS and codes.

### 3.13.1 Design Loads

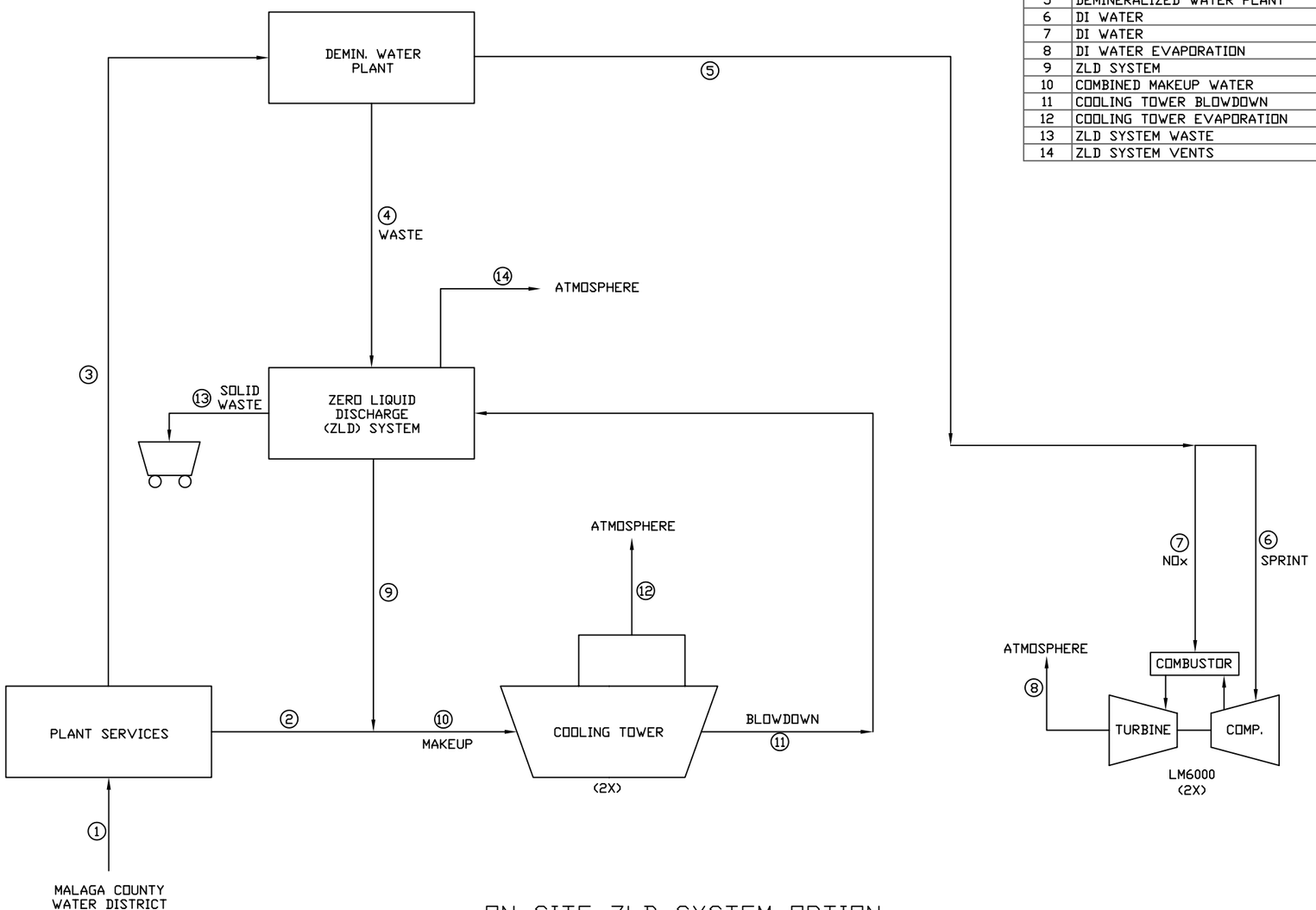
The following load sources will be considered in all structures and foundation designs:

- Dead loads,
- Live loads,
- Wind loads,
- Seismic loads,
- Hydrostatic loads,
- Temperature and pressure loads, and
- Emergency loads (i.e. equipment failure loads).

In accordance with applicable LORS and codes, load combinations will be considered. All structures and foundations shall be designed for the most severe load combination.

Foundations will be designed in accordance with the recommendations contained in the KRCDPP geotechnical investigation, which will be completed prior to construction activities. Foundations for rotating or reciprocating equipment shall satisfy all manufacturers' requirements for design loads, deflection, and vibration limits.

| KRCD PEAKING PLANT WATER BALANCE | | | | |
|---|---|---|---|---|
| POINT NO | FROM | TO | AVG CONDITION (83 F AMB) (GPM) | PEAK CONDITION (105 F AMB) (GPM) |
| 1 | MALAGA COUNTY WATER DISTRICT | PLANT SERVICES | 161 | 210 |
| 2 | PLANT SERVICES | COOLING TOWER MAKEUP | 20 | 69 |
| 3 | PLANT SERVICES | DEMINERALIZED WATER PLANT | 141 | 141 |
| 4 | DEMINERALIZED WATER PLANT | ZLD SYSTEM | 35 | 35 |
| 5 | DEMINERALIZED WATER PLANT | CTG COMBINED NOx & SPRINT INJ. | 106 | 106 |
| 6 | DI WATER | CTG SPRINT INJECTION | 16 | 16 |
| 7 | DI WATER | CTG NOx INJECTION | 90 | 90 |
| 8 | DI WATER EVAPORATION | ATMOSPHERE | 106 | 106 |
| 9 | ZLD SYSTEM | COOLING TOWER MAKEUP | 51 | 65 |
| 10 | COMBINED MAKEUP WATER | COOLING TOWER MAKEUP | 71 | 134 |
| 11 | COOLING TOWER BLOWDOWN | ZLD SYSTEM | 18 | 33 |
| 12 | COOLING TOWER EVAPORATION | ATMOSPHERE | 53 | 101 |
| 13 | ZLD SYSTEM WASTE | SOLIDS RECEPTACLE | 32 LB/HR | 41 LB/HR |
| 14 | ZLD SYSTEM VENTS | ATMOSPHERE | 1.5 | 2 |




ON-SITE ZLD SYSTEM OPTION

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| C | 10/03 | REVISED AVE FLOW RATES | CL | JD | EQ |
| B | 10/03 | REVISED AVE FLOW RATES | CL | JD | EQ |
| A | 10/03 | ISSUED FOR REVIEW | CL | JD | EQ |

NAVIGANT CONSULTING

IEC Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER
KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | JD | JD | EQ |

PROJECT TITLE
KRCD PEAKING PLANT

APPROVED

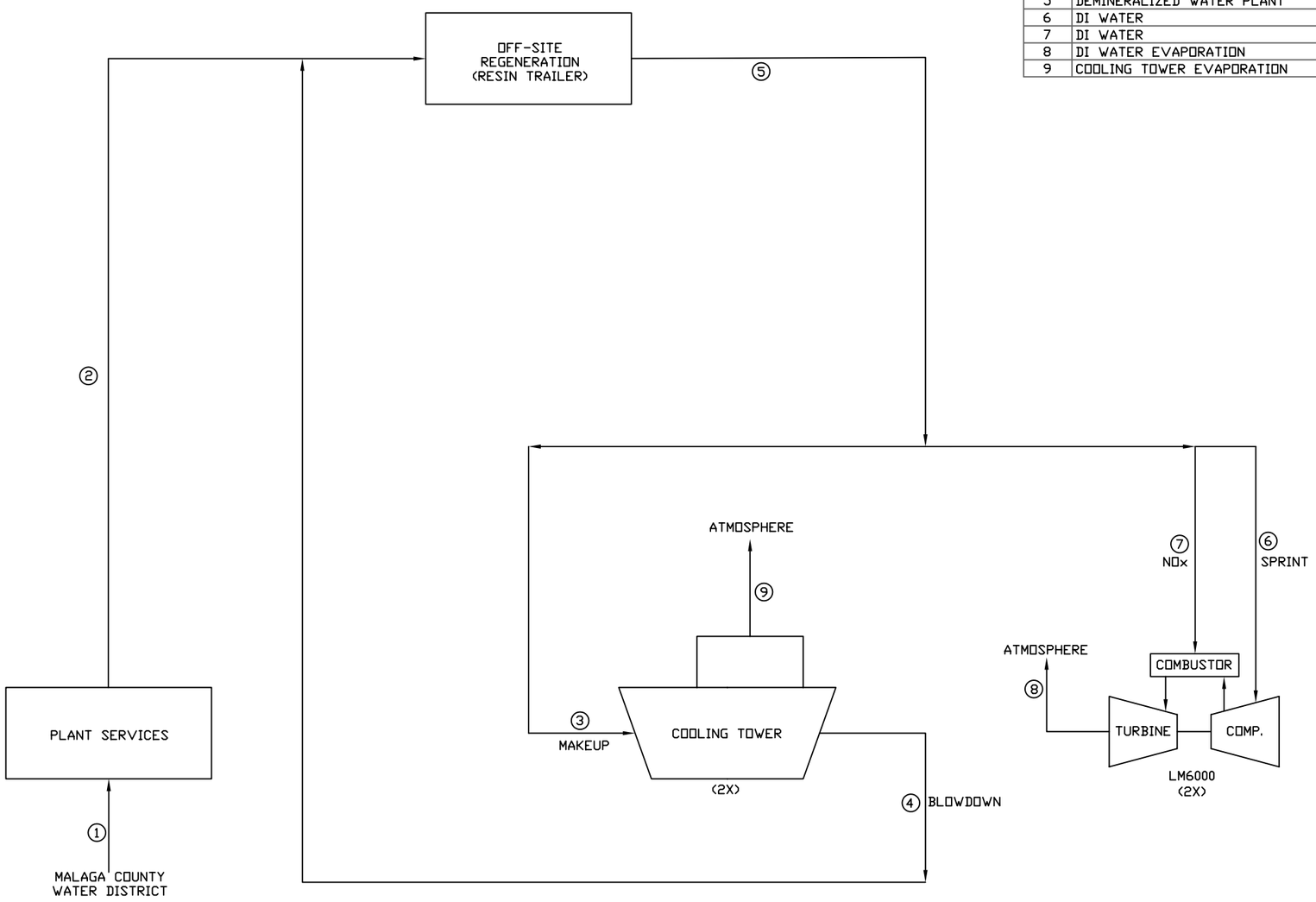
SHEET TITLE
WATER BALANCE

DRAWING NO. FIGURE 3.5-1 REV. C

DATE

BORDER REVISED FEB. 12, 2003

| KRCD PEAKING PLANT WATER BALANCE | | | | |
|---|---|---|---|---|
| POINT NO | FROM | TO | AVG CONDITION (83 F AMB) (GPM) | PEAK CONDITION (105 F AMB) (GPM) |
| 1 | MALAGA COUNTY WATER DISTRICT | PLANT SERVICES | 159 | 207 |
| 2 | PLANT SERVICES | OFF-SITE REGEN. SYSTEM | 159 | 207 |
| 3 | OFF-SITE REGEN. SYSTEM | COOLING TOWER MAKEUP | 53.2 | 101.2 |
| 4 | COOLING TOWER BLOWDOWN | OFF-SITE REGEN. SYSTEM | 0.2 | 0.2 |
| 5 | DEMINERALIZED WATER PLANT | CTG COMBINED NOx & SPRINT INJ. | 159.2 | 207.2 |
| 6 | DI WATER | CTG SPRINT INJECTION | 16 | 16 |
| 7 | DI WATER | CTG NOx INJECTION | 90 | 90 |
| 8 | DI WATER EVAPORATION | ATMOSPHERE | 106 | 106 |
| 9 | COOLING TOWER EVAPORATION | ATMOSPHERE | 53 | 101 |




OFF-SITE REGENERATION SYSTEM OPTION

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| A | 10/03 | ISSUED FOR REVIEW | CL | JD | EQ |

NAVIGANT CONSULTING

Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER
KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

PROJECT NUMBER: NAV1-001
DRAWN: JD
DESIGNED: JD
CHECKED: EQ

APPROVED

DATE

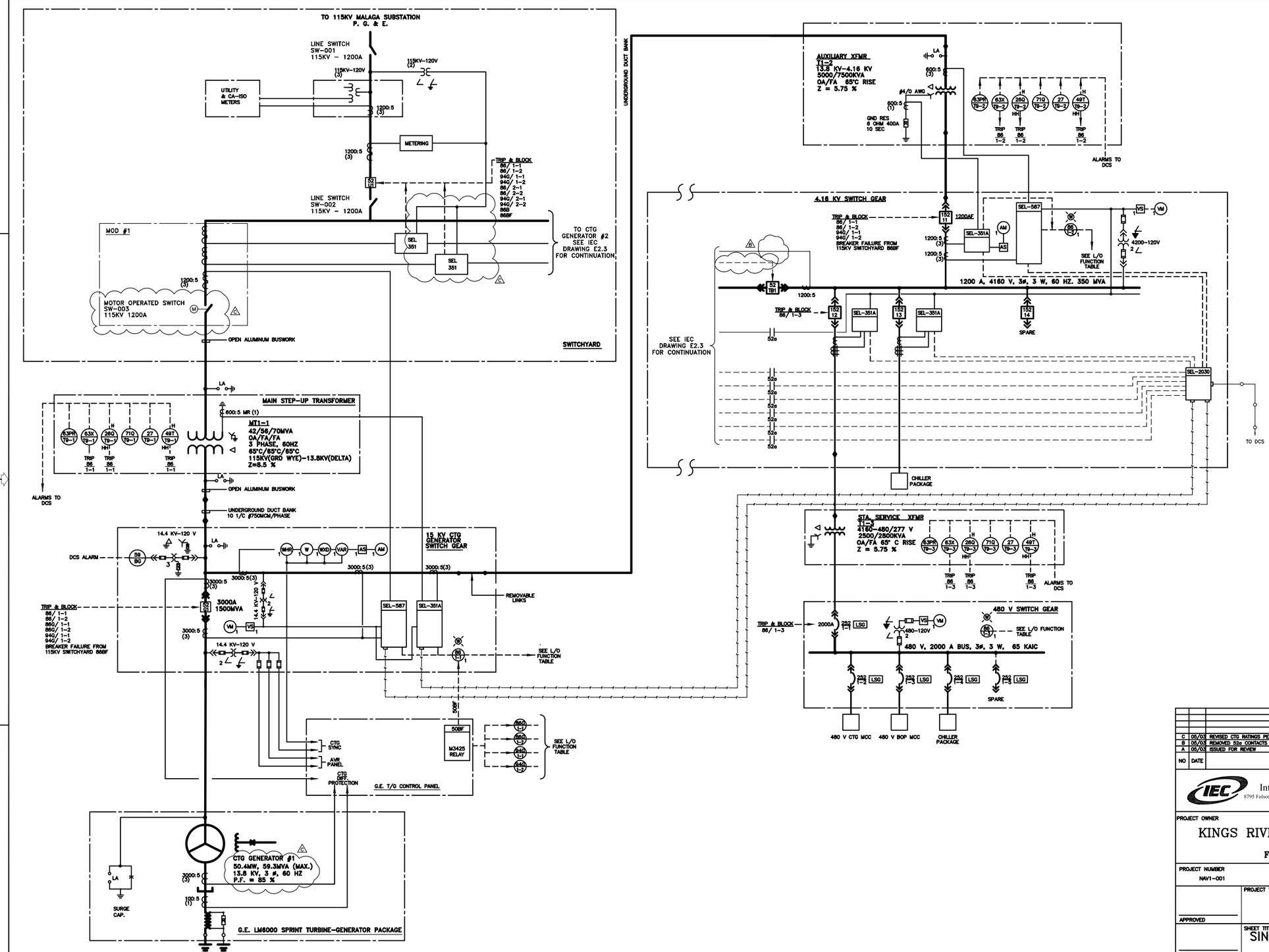
PROJECT TITLE: KRCD PEAKING PLANT

SHEET TITLE: WATER BALANCE

DRAWING NO.: FIGURE 3.5-2

REV.: A

BORDER REVISED FEB. 12, 2003




| RELAY LEGEND (DEVICE LIST) | |
|---|---|
| ANSI DEVICE NUMBER | FUNCTION |
| 26Q | OIL TEMPERATURE, OIL TEMP ALARM |
| 49T | WINDING TEMPERATURE, WINDING TEMP ALARM |
| 63PR | PRESSURE RELIEF |
| 63X | SUDDEN PRESSURE |
| 71Q | LIQUID (OIL) LEVEL |
| 86/1-1 | LOCKOUT RELAY (SEE TABLE) |
| 86/1-2 | LOCKOUT RELAY (SEE TABLE) |
| 86/1-3 | LOCKOUT RELAY (SEE TABLE) |
| SEL-351A | OVERCURRENT RELAY |
| SEL-587 | CURRENT DIFFERENTIAL RELAY |
| SEL-701 | MOTOR PROTECTION RELAY |
| SEL-2030 | COMMUNICATION MODULE |
| SEL-2600 | RTD MODULE |
| 27 | CONTROL UNDERVOLTAGE RELAY |
| 50BF | BREAKER FAILURE BACKUP |
| 59BG | GROUND OVERVOLTAGE |
| AM | AMMETER |
| VM | VOLTMETER |
| AS | AMMETER SWITCH |
| VS | VOLTMETER SWITCH |
| W | WATT METER |
| VAR | VARMETER |
| WHR | WATT-HOUR METER |
| WXD | WATT TRANSDUCER |
| RTD | TEMPERATURE DETECTOR (MOTORS ≥ 250HP, SIX (6) STATOR WINDING, TWO (2) MOTOR BEARING) |

| LOCKOUT RELAY FUNCTION TABLE UNIT #1 | |
|---|---|
| 86 1-1 | TRIP & BLOCK CLOSE CTG BREAKER 52-G1<br>TRIP & BLOCK CLOSE SWYD BREAKER(S)<br>TRIP & BLOCK CLOSE BREAKER 152-11<br>STOP COMBUSTION TURBINE<br>ALARMS DCS (N.C. CONTACT) |
| 86 1-2 | TRIP & BLOCK CLOSE CTG BREAKER 52-G1<br>TRIP & BLOCK CLOSE SWYD BREAKER(S)<br>TRIP & BLOCK CLOSE BREAKER 152-11<br>STOP COMBUSTION TURBINE<br>ALARMS DCS (N.C. CONTACT) |
| 86 1-3 | TRIP & BLOCK CLOSE BREAKER 252/ 1-1<br>TRIP & BLOCK CLOSE BREAKER 152-12<br>ALARMS DCS (N.C. CONTACT) |
| 86G 1-1 | TRIP & BLOCK CLOSE BREAKER 52-G1<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 86G 1-2 | TRIP & BLOCK CLOSE BREAKER 52-G1<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 94GB 1-1 | TRIP & BLOCK CLOSE BREAKER 52-G1<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 94GB 1-2 | TRIP & BLOCK CLOSE BREAKER 52-G1<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |

NOTES:

1. AUXILIARY TRANSFORMER, STATION SERVICE TRANSFORMER AND BUS SIZES ARE PRELIMINARY.

LEGEND

- FIBER OPTIC (COMMUNICATION CABLE)
- DATA LINK (COMMUNICATION CABLE)
- HARDWIRED CONNECTIONS

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| C | 05/03 | REVISED CTG RATINGS PER COMMENTS | JE | JD | BF |
| B | 05/03 | REMOVED 52a CONTACTS | JE | JD | BF |
| A | 05/03 | ISSUED FOR REVIEW | JE | JD | BF |

Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010

PROJECT OWNER
KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | JE | BF | JD |

PROJECT TITLE
KRCD
PEAKING PLANT

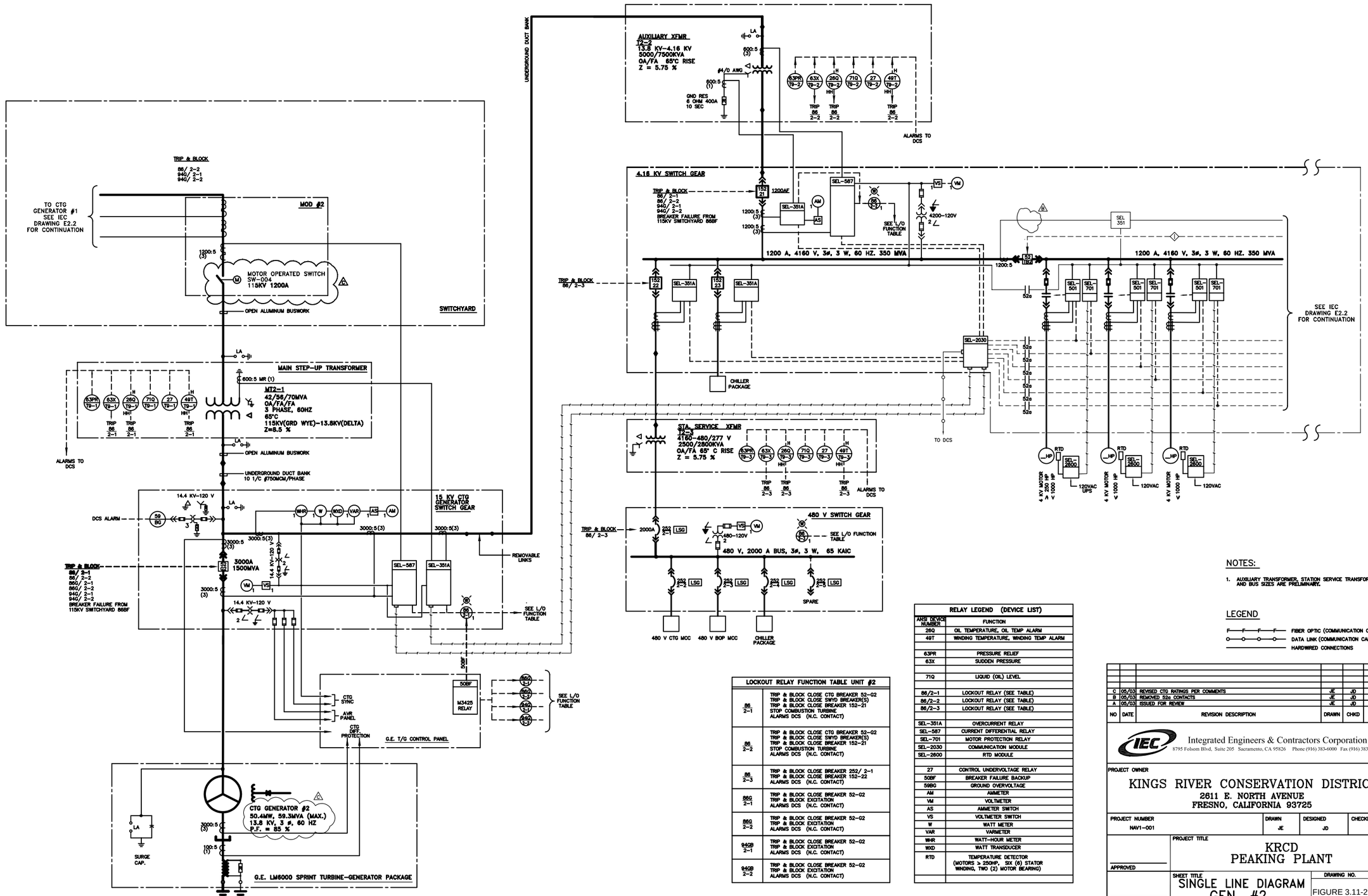
APPROVED

SHEET TITLE
SINGLE LINE DIAGRAM
GEN. #1

DRAWING NO. FIGURE 3.11-1 REV. C

DATE

BORDER REVISED FEB. 12, 2003




## NOTES:

1. AUXILIARY TRANSFORMER, STATION SERVICE TRANSFORMER AND BUS SIZES ARE PRELIMINARY.

## LEGEND

- F—F—F—F— FIBER OPTIC (COMMUNICATION CABLE)
- O—O—O—O— DATA LINK (COMMUNICATION CABLE)
- ——— HARDWIRED CONNECTIONS

## LOCKOUT RELAY FUNCTION TABLE UNIT #2

| | |
|---|---|
| 86 2-1 | TRIP & BLOCK CLOSE CTG BREAKER 52-G2<br>TRIP & BLOCK CLOSE SWYD BREAKER(S)<br>TRIP & BLOCK CLOSE BREAKER 152-21<br>STOP COMBUSTION TURBINE<br>ALARMS DCS (N.C. CONTACT) |
| 86 2-2 | TRIP & BLOCK CLOSE CTG BREAKER 52-G2<br>TRIP & BLOCK CLOSE SWYD BREAKER(S)<br>TRIP & BLOCK CLOSE BREAKER 152-21<br>STOP COMBUSTION TURBINE<br>ALARMS DCS (N.C. CONTACT) |
| 86 2-3 | TRIP & BLOCK CLOSE BREAKER 252/ 2-1<br>TRIP & BLOCK CLOSE BREAKER 152-22<br>ALARMS DCS (N.C. CONTACT) |
| 86G 2-1 | TRIP & BLOCK CLOSE BREAKER 52-G2<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 86G 2-2 | TRIP & BLOCK CLOSE BREAKER 52-G2<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 94GB 2-1 | TRIP & BLOCK CLOSE BREAKER 52-G2<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |
| 94GB 2-2 | TRIP & BLOCK CLOSE BREAKER 52-G2<br>TRIP & BLOCK EXCITATION<br>ALARMS DCS (N.C. CONTACT) |

## RELAY LEGEND (DEVICE LIST)

| ANSI DEVICE NUMBER | FUNCTION |
|---|---|
| 26Q | OIL TEMPERATURE, OIL TEMP ALARM |
| 49T | WINDING TEMPERATURE, WINDING TEMP ALARM |
| | |
| 63PR | PRESSURE RELIEF |
| 63X | SUDDEN PRESSURE |
| | |
| 71Q | LIQUID (OIL) LEVEL |
| | |
| 86/2-1 | LOCKOUT RELAY (SEE TABLE) |
| 86/2-2 | LOCKOUT RELAY (SEE TABLE) |
| 86/2-3 | LOCKOUT RELAY (SEE TABLE) |
| | |
| SEL-351A | OVERCURRENT RELAY |
| SEL-587 | CURRENT DIFFERENTIAL RELAY |
| SEL-701 | MOTOR PROTECTION RELAY |
| SEL-2030 | COMMUNICATION MODULE |
| SEL-2600 | RTD MODULE |
| | |
| 27 | CONTROL UNDERVOLTAGE RELAY |
| 50BF | BREAKER FAILURE BACKUP |
| 59BG | GROUND OVERVOLTAGE |
| AM | AMMETER |
| VM | VOLTMETER |
| AS | AMMETER SWITCH |
| VS | VOLTMETER SWITCH |
| W | WATT METER |
| VAR | VARMETER |
| WHR | WATT-HOUR METER |
| WXD | WATT TRANSDUCER |
| RTD | TEMPERATURE DETECTOR (MOTORS ≥ 250HP, SIX (6) STATOR WINDING, TWO (2) MOTOR BEARING) |
| | |

| NO | DATE | REVISION DESCRIPTION | DRAWN | CHKD | APP'D |
|---|---|---|---|---|---|
| C | 05/03 | REVISED CTG RATINGS PER COMMENTS | JE | JD | BF |
| B | 05/03 | REMOVED 52a CONTACTS | JE | JD | BF |
| A | 05/03 | ISSUED FOR REVIEW | JE | JD | BF |


Integrated Engineers & Contractors Corporation
8795 Folsom Blvd, Suite 205 Sacramento, CA 95826 Phone (916) 383-6000 Fax (916) 383-6010


PROJECT OWNER

KINGS RIVER CONSERVATION DISTRICT
2611 E. NORTH AVENUE
FRESNO, CALIFORNIA 93725

| PROJECT NUMBER | DRAWN | DESIGNED | CHECKED |
|---|---|---|---|
| NAV1-001 | JE | JD | BF |

PROJECT TITLE: KRCD PEAKING PLANT

APPROVED

DATE

SHEET TITLE: SINGLE LINE DIAGRAM GEN. #2

DRAWING NO.: FIGURE 3.11-2

REV.: C

BORDER REVISED FEB. 12, 2003

# CHAPTER 4.0 EFFICIENCY AND ENERGY RESOURCES

## 4.1 EFFICIENCY ANALYSIS

As described further in Chapter 2, Project and Facility Description, the proposed Kings River Conservation District Peaking Plant (KRCDPP) will be a 97 megawatt (MW) nominal net output natural gas fired, simple cycle combustion turbine generating facility. Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. The KRCDPP will consist of two General Electric (GE) LM6000 Sprint combustion turbine generators (CTGs) equipped with water injection to control oxide of nitrogen (NOx) emissions, water injection for power augmentation, and other associated support equipment providing maximum generating capacity of 99.4 MW gross. The CTGs are an aero derivative design that is expected to achieve a fuel efficiency of approximately 35 percent at full load and average annual ambient conditions. This fuel efficiency is high relative to other, larger, non-aero derivative combustion turbines since fuel efficiency is a key success factor for aircraft applications. This level of efficiency is achieved when the CTGs are operating at full load with inlet air chilling. Operation at less than full load will result in slightly lower efficiencies.

As described further in Chapter 1, Executive Summary, KRCD has executed a Power Purchase Agreement (PPA) with the California Department of Water Resources (CDWR) that requires KRCD to sell power from a natural gas fired simple cycle plant consisting of two GE LM6000 CTGs. In addition, KRCD is required to utilize the two natural-gas fired GE LM6000 Sprint CTGs that were obtained by the State of California under terms of a settlement agreement with Williams Energy Marketing and Trading Company (Williams Energy). Given these requirements of the PPA, alternative generating technologies for the KRCDPP are not possible and therefore are not considered in this application. Other technologies include nuclear, hydroelectric, biomass, solar and wind. In accordance with the requirements of the PPA, KRCD is proceeding with the development of the GE LM6000 Sprint CTGs, which are natural-gas fired and operated in simple-cycle technology. The use of comparable alternative machines, including the Alstom GTX100 and Pratt and Whitney FT7 Twin Pac gas turbines were also not considered, since the GE LM6000 units were provided to KRCD for development.

The KRCDPP will be dispatched by CDWR, or by the California Independent System Operator (CAISO) if and when directed by CDWR, to meet the energy needs of the Pacific Gas and Electric (PG&E) system in the greater Fresno area. The KRCDPP will be designed with quick startup and loading, flexible load following and cyclic duty (daily start/stop) capabilities. Although capable of part load operation, KRCD expects the

KRCDPP will be dispatched at full load when called upon by DWR due to the high thermal efficiency available at full load, and the relatively small size of the KRCDPP relative to the size of the load in the greater Fresno area.

Development of the proposed KRCDPP meets the objectives of the State of California and the CDWR to develop a peaking power project utilizing the two natural-gas fired GE LM6000 Sprint CTGs that were obtained by the state under terms of a settlement agreement with Williams Energy and to develop the units in the most cost effective manner possible. Also, the quick startup and loading, flexible load following and cyclic duty (daily start/stop) capabilities associated with the configuration of the proposed KRCDPP will help meet objectives of the state which are to provide power to the greater Fresno area during periods of high demand.

## 4.2 ENERGY RESOURCES

The proposed KRCDPP will be a natural gas fired facility. The KRCDPP will burn natural gas at a nominal rate of 950 million British thermal units per hour higher heating value (MMBtu/hr HHV) when operating at full load under average annual ambient conditions. Natural gas will be the only fuel used to fire the KRCDPP.

PG&E will deliver natural gas to the project site at a nominal pressure of 200 to 500 pounds per square inch gauge (psig) from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. The gas will be routed to a new PG&E metering station located on the southern portion of the project site. From the metering station, gas will be directed into two electric driven 700 kilowatt (KW) gas compressors where the gas pressure will be increased to the approximately 700 psig required by the CTGs. A third 700 KW compressor will serve as backup should one of the other compressors be taken out of service. The compressor will be equipped with gas pressure unloading systems to allow for more efficient operations when the inlet gas pressure exceeds 200 psig. PG&E has determined that its current infrastructure is capable of delivering the required quantity of gas to the KRCDPP (PG&E, 2003).

PG&E's existing gas infrastructure is extensive and offers vast supplies of gas in both Canada and the Southwestern United States. Gas supplies to the KRCDPP would be provided likely through a portfolio of longer-term firm gas purchases and gas storage, as well as through procurement of additional short-term supplies on the spot market. The KRCDPP, when constructed and operated as proposed, would produce a nominal 97 MW of electric power with a fuel efficiency of 35 percent. The KRCDPP's maximum fuel consumption rate will be 1050 MMBtu/hr HHV. While it will consume a substantial amount of energy, the KRCDPP will do so in an efficient manner. The KRCDPP will not

create a significant adverse impact on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. The maximum fuel consumption of the KRCDPP does not represent a significant portion of natural gas supplies to California. PG&E has far more gas supply and transportation capability than that which is required to serve the proposed KRCDPP. The KRCDPP would not result in a substantial increase in the demand for natural gas in California. The KRCDPP would not result in a significant impact on energy resources.

## 4.3 REFERENCES

CEC, 2003. Final Initial Study – Modesto Irrigation District Electric Generation Station –Ripon. CEC Staff Report. August 2003.

KRCD, 2003. Preliminary Application for Service. Request for gas supply to Pacific Gas and Electric. June 5, 2003.

Modesto Irrigation District (MID), 2003. Administrative Draft –Modesto Electric Generation Station Small Power Plant Exemption Application. Prepared for Modesto Irrigation District by CH2M Hill. April 14, 2003.

PG&E, 2003. Gas Services to Kings River Conservation District. Letter on available gas supplies from PG&E to KRCD. August 21, 2003.

# CHAPTER 5.0 ENVIRONMENTAL CONSIDERATIONS

Fifteen environmental resource areas were analyzed in this Small Power Plant Exemption (SPPE) application for potentially significant impacts associated with the development, construction and operation of the proposed Kings River Conservation District Peaking Plant (KRCDPP). Detailed descriptions of the analysis are included in the subsequent sections. Based on the analysis in this application, it has been determined that the construction and operation of the proposed KRCDPP, with the mitigation measures proposed herein, will not result in any significant environmental impacts. Environmental resource areas analyzed in this SPPE include:


Section 5.1 Air Quality
Section 5.2 Noise
Section 5.3 Water Resources
Section 5.4 Visual Resources
Section 5.5 Land Use
Section 5.6 Agriculture and Soils
Section 5.7 Traffic and Transportation
Section 5.8 Public Health
Section 5.9 Worker Health and Safety
Section 5.10 Hazardous Materials ands Waste Management
Section 5.11 Geologic Resources and Hazards
Section 5.12 Socioeconomics
Section 5.13 Cultural Resources
Section 5.14 Paleontological Resources
Section 5.15 Biological Resources

# SECTION 5.1 AIR QUALITY

## 5.1.1 Introduction

This section provides an assessment of the potential risks to human health that are associated with the airborne emissions of criteria pollutants (i.e., emissions for which either National Ambient Air Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS) have been established) from normal operations of the proposed Kings River Conservation District Peaking Plant (KRCDPP). The assessment of impacts from airborne emissions of non-criteria pollutants is presented in Section 5.8, Public Health. Similarly, a discussion of potential impacts due to an accidental (emergency) release of acutely hazardous materials (i.e., aqueous ammonia) stored and used on-site in provided in Section 5.10, Hazardous Materials and Waste Management.

Section 5.1.2 describes the regional area including a description of the KRCDPP area and the nearby terrain. Section 5.1.3 discusses the federal, state and local laws, ordinances, regulations and standards (LORS) that are applicable to the KRCDPP as well as an identification of air quality related permits that are required and applicable agency contacts. Section 5.1.4 provides a discussion of the potential impacts. This discussion is based on an estimate of the KRCDPP's potential air emissions during its various operating scenarios (e.g., normal operation, startup and shutdown, commissioning) and the subsequent results of a Air Quality Impact Analysis (i.e., air dispersion modeling), which provides an estimate of the potential impacts to air quality through the release of criteria emissions from the KRCDPP combustion turbines (CTs), CT inlet air evaporative cooling towers and zero liquid discharge (ZLD) system evaporative tower. This section also presents an environmental checklist of possible impacts to air quality associated with construction and operation of the KRCDPP. Section 5.1.5 provides a summary of the measures proposed to mitigate potential impacts and Section 5.1.6 discusses the potential for cumulative impacts.

## 5.1.2 Affected Environment

### *5.1.2.1 Project Site Area*

Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. The KRCDPP is a simple-cycle peaking electrical power generating facility, which will consist of two LM6000 General Electric (GE) natural gas-fired CTs along with supporting equipment and have a total electrical generating capacity of approximately 97 megawatts (MW).

KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections, as described below. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

As previously mentioned, a ZLD system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies would be collected and transported off-site for proper disposal. The offsite ZLD technology would utilize a portable water treatment system, which would be periodically removed and regenerated offsite as the treatment chemicals are consumed. The onsite ZLD option with the greatest potential for air emissions impacts, caused by non-criteria air emissions. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

#### *5.1.2.2 Sensitive Receptors*

The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E Malaga Substation located on the northeast intersection of North and Willow Avenues. The nearest of these residences is approximately 1,000 feet northeast of the center of KRCDPP project site, as shown on Figure 2.2-2 in Chapter 2, Project and Facility Description.

Numerous other sensitive receptors (including schools, places of worship, hospitals and emergency-response facilities, day-care and long-term health care facilities) are also located within a two-mile radius of the KRCDPP project site. Information on sensitive receptors was obtained through various computer-mapping programs (including Precision Streets, Topographic USA, and Microsoft Streets/Trips) and was verified through on-line phone book listings. Information on these sensitive receptors, including the approximate distance from the KRCDPP site is included below.

**Schools**

The nearest school, the Malaga Elementary School located at 3910 S. Ward, is approximately .62 miles to the southeast of the KRCDPP project site. As shown below in Table 5.1-1, there are a total of 7 schools within an approximately 2-mile radius of the KRCDPP project site.

| Table 5.1-1<br>Schools Located Within 2 Miles of the Project Site<br>KRCDPP | | | |
|---|---|---|---|
| **School Name** | **Address** | **School District** | **Approximate Distance from KRCDPP[1]** |
| Malaga Elementary | 3910 S. Ward Avenue<br>Fresno, CA 93725-2538 | Fowler Unified | .62 miles |
| Aynesworth Elementary | 4765 E. Burns Avenue<br>Fresno, CA 93725-1732 | Fresno Unified | 1.5 miles |
| Ezekiel Balderas Elementary | 4625 E. Florence<br>Fresno, CA 93725-1110 | Fresno Unified | 1.8 miles |
| Calwa Elementary | 4303 E. Jensen Avenue<br>Fresno, CA 93725-2105 | Fresno Unified | 1.4 miles |
| Edith B. Storey Elementary | 5250 E. Church Avenue<br>Fresno, CA 93725-0900 | Fresno Unified | 2.2 miles |
| Elizabeth Terronez Middle School | 2300 S. Willow<br>Fresno, CA 93725 | Fresno Unified | 1.9 miles |
| Year-Round Achievement Center | 5090 E. Church<br>Fresno, CA 93725 | Fresno Unified | 1.8 miles |
| [1] Source: Microsoft Streets and Trips, 2001 | | | |

### Places of Worship

The nearest house of worship, Jubilee Deliverance Ministries, is located along the north side of North Avenue, east of Chestnut Avenue and approximately 0.4 miles to the northeast of the KRCDPP project site. Other houses of worship within a 2 mile radius of the KRCDPP include: Celebration Christian Center located at 3757 South Ward Avenue and 0.6 miles from the KRCDPP, and Cristo Rey located at 3545 South Calvin Avenue and 0.6 miles from the KRCDPP.

### Hospitals/Emergency Response Facilities

The nearest hospitals to the KRCDPP are the University Medical Center located at 445 South Cedar Avenue, and approximately 5.0 miles north of the KRCDPP site and the Community Medical Center of Fresno located at Fresno and R Streets and approximately 5.8 miles northwest of the KRCDPP. In addition, Fresno County is served by six ambulance services or agencies for emergency response. American Ambulance is the sole 9-1-1 paramedic ambulance provider for over 4000 square miles of Fresno County and including the area of the KRCDPP. The communications center dispatches every 9-1-1 and non-emergent ambulance request and is located at the northeast corner of Divisadero

Street and Freeway 41. The average response time for emergency calls ranges from five to eight minutes (County of Fresno, 2000).

Long-Term Health and Day Care Facilities approximately 1.2 miles from the KRCDPP project site, the Sunnyside Convalescent Hospital located at 2939 South Peach Avenue. The nearest day care facility is In & Out Daycare located at 2240 South Matus Avenue and 1.9 miles from the KRCDPP.

#### *5.1.2.3 Topography*

Terrain in the vicinity of the KRCDPP is relatively flat. The project site is relatively level with an elevation of approximately 295 feet above sea level (FASL). Flat terrain surrounds the KRCDPP in all directions. The San Joaquin Valley is bordered by the Coast Ranges to the west, the Sierra Nevada to the east, and the Tehachapi Mountains to the south. The nearest topographical relief (i.e., elevated terrain) is located approximately 15 miles to the east and northeast (see Section 5.8-Public Health, Appendix 5.8-1, which contains topographical maps at a scale of 1:24,000 of the area within ten miles of the KRCDPP project site).

#### *5.1.2.4 Climate and Meteorology*

The climate of the San Joaquin Valley includes hot, dry summers and mild winters. The hottest days generally occur in July. The 30-year average temperature for July is 81 degrees Fahrenheit (°F). The average maximum daily temperature is 97 °F. The coldest temperatures occur in December. The 30-year average temperature for December is 45 °F, with average maximum daily temperatures around 53 °F. Rainfall typically occurs during November through April. A dense fog, known as a Tule fog is a frequent wintertime occurrence. Average annual precipitation is between 11 and 12 inches.

Winds within the San Joaquin Valley generally fall into four categories, upvalley (northerly winds flowing through the Sacramento Delta) downvalley/drainage (southerly winds flowing into the Sacramento Delta), southerly, and northerly (no marine air). A figure summarizing these flow patterns is provided in Appendix 5.1-1. Annual and quarterly wind roses, geographical representations of wind flow, for the year 1989 from Fresno Airport are also provided in Appendix 5.1-1. The wind rose data reveals that the winds in the area are predominantly from the northwest all year. Southwesterly winds show a secondary predominance during the rainy season. Annually, calm conditions occurred 11 percent of the time.

Temperature inversions are a frequent occurrence in the Fresno area. A temperature inversion occurs when temperature increases with height, instead of the typical decrease

in temperature with height. An increase in temperature with height creates a stable atmosphere, which limits the vertical mixing of the air and can contribute to elevated pollution concentrations. Annually, for days on which measurements were made, inversions were measured 99 percent of the time at 5 am, 89 percent of the time at 10 am, and 57 percent of the time at 3 pm (California Air Resources Board (CARB), 1990).

### *5.1.2.5 Ambient Air Quality Standards*

Air quality standards have been developed to protect the public health and welfare. The federal Clean Air Act (CAA) has established NAAQS for several "criteria" pollutants, including ozone (O3), nitrogen dioxide (NO2), carbon monoxide (CO), sulfur dioxide (SO2), particulate matter 10 microns (µm) diameter and smaller (PM10), particulate matter 2.5 µm diameter and smaller ($PM_{2.5}$), and lead (Pb). The proposed KRCDPP is located within the San Joaquin Valley Air Pollution Control District (SJVAPCD) in a region that has been classified as non-attainment of the O3 and PM10 NAAQS. No attainment/non-attainment designation under the NAAQS has been made for $PM_{2.5}$ yet. The area of the surrounding the proposed KRCDPP is in attainment or unclassified for the remaining pollutants under the NAAQS.

California has also established its own standards, the CAAQS, which are more stringent than the NAAQS. The area surrounding the proposed KRCDPP has been classified as non-attainment of the CAAQS for O3 and PM10. A summary of the NAAQS and CAAQS can be found in Table 5.1-2.

**Table 5.1-2**
**Ambient Air Quality Standards**
**KRCDPP**

| Pollutant | Averaging Time | California Standards[1] | Federal Standards[2] | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| O3 | 1-hour<br>8-hour | 0.09 ppm (180 µg/m$^3$)<br>-- | 0.12 ppm (235 µg/m$^3$)<br>0.08 ppm (157 µg/m$^3$) | Same as primary standard |
| Respirable PM10 | Annual arithmetic mean<br>24-hour | 20 µg/m$^3$<br>50 µg/m$^3$ | 50 µg/m$^3$<br>150 µg/m$^3$ | Same as primary standard |
| Fine Particulate Matter ($PM_{2.5}$) | 24-hour<br>Annual arithmetic mean | --<br>12 µg/m$^3$ | 65 µg/m$^3$<br>15 µg/m$^3$ | Same as primary standard |
| CO | 8-hour<br>1-hour | 9.0 ppm (10,000 µg/m$^3$)<br>20 ppm (23,000 µg/m$^3$) | 9 ppm (10,000 µg/m$^3$) | None |

| Table 5.1-2<br>Ambient Air Quality Standards<br>KRCDPP | | | | |
|---|---|---|---|---|
| | | | Federal Standards[2] | |
| Pollutant | Averaging Time | California Standards[1] | Primary | Secondary |
| | | | 35 ppm (40,000 µg/m$^3$) | |
| NO2 | Annual<br>1-hour | -<br>0.25 ppm (470 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$)<br>-- | Same as primary standard |
| SO2 | Annual arithmetic mean<br>24-hour<br>3-hour<br>1-hour | --<br><br>0.04 ppm (105 µg/m$^3$)<br><br>0.25 ppm (655 µg/m$^3$) | 0.030 ppm (80 µg/m$^3$)<br><br><br>0.14 ppm (365 µg/m$^3$)<br>-- | --<br><br>--<br><br>0.5 ppm (1300 µg/m$^3$) |

1. CAAQS for O3, CO, SO2 (1 and 24 hour), $NO_2$, suspended particulate matter -- PM10, fine particulate matter -- $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for Pb and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. New California annual PM10 standards and $PM_{2.5}$ annual average standards were approved by CARB on June 20, 2002. These standards should be finalized in 2003.

2. NAAQS other than for O3, particulates, and those based on annual averages are not to be exceeded more than once a year. The 1-hour O3 standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour O3 standard is attained when the 3-year average of the 4th highest daily concentrations are 0.08 ppm or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m$^3$. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 65 µg/m$^3$.

Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The NAAQS PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

A 1999 federal court ruling blocked the implementation of the 8-hour O3 standard. While the courts have upheld the standard since then, United States Environmental Protection Agency (USEPA) has not revised its implementation plan.

**Acronyms:**
ppm – parts per million
µg/m$^3$ - micrograms per cubic meter

### *5.1.2.6 Existing Air Quality*

Air quality data for the area near the KRCDPP is presented below in Table 5.1-3. The Fresno Drummond site is the closest ambient air quality monitoring station to the KRCDPP. The Fresno Hamilton site is the next closest, and then the Fresno First Street site. No SO2 monitoring data has been collected near the KRCDPP site. Therefore, data measured in Bakersfield is used as a representation for the area surrounding the KRCDPP site.

**Table 5.1-3**
**Baseline Air Quality In The Region**
**KRCDPP**

| Pollutant | Averaging Time | Pollutant Concentrations[1] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fresno Drummond | | | Fresno First Street | | | Fresno Hamilton | | Bakersfield | | | |
| | | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 1999 | 2000 | 2001 |
| O3 | 1-hour | .13 | .13 | .15 | .14 | .13 | .14 | | | | | | |
| | 8-hour | .10 | .10 | .11 | .10 | .11 | .12 | | | | | | |
| NO2 | 1-hr | .08 | .07 | .09 | .09 | .09 | .09 | | | | | | |
| | Annual | .02 | .02 | .02 | .02 | .02 | .02 | | | | | | |
| CO | 1-hour | 9.0 | 5.2 | | 7.9 | 6.7 | | | | | | | |
| | 8-hour | 3.53 | 4.27 | 3.54 | 5.24 | 4.64 | 4.51 | | | | | | |
| SO2 | 1-hour | | | | | | | | | | .01 | .01 | .03 |
| | 24-hour | | | | | | | | | | .006 | .003 | .005 |
| | Annual | | | | | | | | | | .003 | .003 | .002 |
| PM10 | 24-hour | 130 | 186 | 106 | 138 | 193 | 96 | | | | | | |
| | Annual arithmetic | 41.4 | 50.2 | 52 | 40.3 | 42.6 | 39 | | | | | | |
| | Annual geometric | 39 | 45 | 46 | 33.5 | 35.3 | 33 | | | | | | |
| $PM_{2.5}$ | 24-hour | | | | 160. | 110. | 84 | 83.5 | 88.2 | 73.9 | | | |
| | 24-hour (98th percentile)[2] | | | | | 101. | 86. | | | 65 | | | |
| | Annual | | | | 25.5 | 19.8 | 21.6 | 77 | 18.6 | 21.3 | | | |

Source:
CARB, 2002.
CARB, 2003

[1]Concentration units are parts per million (ppm) for O3, NO2, CO, and SO2 and micrograms/cubic meter ($\mu g/m^3$) for PM10 and $PM_{2.5}$
[2]Three year average concentration

**O3**

O3 is formed at ground level by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in the presence of sunlight and heat. Sources of O3 include motor vehicles, industrial sources, gasoline vapors, and chemical solvents. Health effects associated with elevated ozone levels include breathing difficulties and lung damage (CARB, 2001).

Review of ambient O3 data as measured at nearby air quality monitoring locations (i.e., Fresno Drummond and First Street) reveals that the KRCDPP is in a region that is non-attainment of the NAAQS and CAAQS for O3.

**NO2**

Nitrogen dioxide (NO2) is formed when fuels are burned at high temperatures. Nitrogen oxides (i.e., NO2 + NO) are major components in O3 formation and react to form nitrate particles and acid aerosols. Motor vehicles make up almost half of NOx emissions, with electric utilities comprising approximately 25 percent of NOx emissions. NOx can also contribute to respiratory problems (USEPA, 2003a).

Review of ambient NOx data reveals that the area surrounding the KRCDPP is in attainment of the NAAQS and CAAQS for NO2. Monitoring data for the last three years show that ambient NO2 concentrations are well within the limits of both the NAAQS and CAAQS.

**CO**

CO is formed when the carbon in fuel is not burned completely. The majority of CO emissions come from mobile sources, both on-road vehicles (cars, trucks, etc.) and off-road vehicles (construction equipment, airplanes, etc.). Industrial processes, including power generation contribute a much smaller percentage of the total CO emissions (EPA, 2003b). Carbon monoxide is most serious for people with heart disease and can contribute to other cardiovascular problems. Higher levels of CO can cause headaches, nausea, and reduced mental alertness (USEPA, 2003b; CARB, 2001).

Review of the ambient CO data reveals that the area surrounding the KRCDPP is in attainment of the NAAQS and CAAQS for CO.

**SO2**

Sulfur dioxides (SO2) are formed when fuels containing sulfur are burned, gasoline is extracted from oil, or metals are extracted from ore. Approximately two thirds of all SO2 emissions originate from electric utilities (USEPA, 2003c), especially those that burn

coal and oil. Natural gas contains very low amounts of sulfur; consequently SO2 emissions from natural-gas fired power plants are low. Health effects from high SO2 concentrations include difficulty breathing and over time can cause respiratory illness and aggravate existing heart problems. Additionally, SO2 can cause decay of building materials and paints. Chemical reactions of SO2 and $NO_2$ can form acid rain, which can damage vegetation, lakes, and streams. Formation of sulfate particles caused by chemical reactions of SO2 can contribute to visibility impairment (EPA, 2003c).

Review of the ambient S02 data reveals that the San Joaquin air basin is in attainment of the NAAQS and CAAQS for SO2. As mentioned previously, no monitoring data is available near the KRCDPP site. Therefore, SO2 monitoring data from Bakersfield was used to conservatively represent SO2 concentrations in the vicinity of the KRCDPP.

**Fine Particulates (PM10 and $PM_{2.5}$)**

Particulate is the term for particles found in the air. Some particles are directly emitted into the air, such as those emitted from motor vehicle exhaust, agricultural tilling, industrial sources, wood burning, or wind-blown dust. Other particles are formed from chemical reactions when burning fuels react with sunlight and water vapor. Damage from particulate matter includes respiratory health effects, visibility impairment, and atmospheric deposition onto the soil, water, or structures (USEPA, 2003d).

Review of the PM10 ambient data reveals that the KRCDPP is in an area that is non-attainment of both the NAAQS and CAAQS PM10 standards. No determination has been made under the NAAQS and CAAQS regarding the area's attainment status with respect to $PM_{2.5}$ standards.

### 5.1.3 Laws, Ordinances, Regulations, and Standards

Applicable federal, state and local LORS that affect public health and are potentially applicable to the KRCDPP are summarized below in Table 5.1-4.

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| **Federal** | | | |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 51 & 52 - Prevention of Significant Deterioration (PSD) review | US EPA, Region IX | Maintenance of NAAQS and air quality related values | For the construction of new major sources or major modifications to existing major sources, requires PSD review. (Note: PSD only applies to criteria pollutants for which ambient concentrations do not exceed the NAAQS).<br><br>A PSD review and the associated permit are <u>not required</u> for the KRCDPP, as KRCDPP emissions of any one PSD pollutant do not exceed the applicable trigger level of 250 tons per year. |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 51 & 52 - New Source Review (NSR) | SJVAPCD with review oversight by the USEPA | Maintenance of NAAQS | For new or modified major stationary sources requires pre-construction review/permitting.<br><br>The KRCDPP will meet NSR requirements through its compliance with the SJVAPCD's NSR rule (see below). |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 60 - New Source Performance Standards (NSPS) | SJVAPCD with review oversight by the US EPA | Maintenance of NAAQS | The NSPS mandate standards of performance for specific categories of equipment to limit the emissions of criteria pollutants (i.e., pollutants for which NAAQS have been established).<br><br>The only applicable NSPS for the KRCDPP is Subpart GG (Standards of Performance for Stationary Gas |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| | | | Turbines). Although applicable, this standard is functionally outdated and the KRCDPP will meet this NSPS requirement through its compliance with the SJVAPCD's NSR rule (see below). |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 72 - Title IV (Acid Rain Program) | SJVAPCD with review oversight by the USEPA | Reduction of impacts due to acidic rain | Requires monitoring of NOx and SO2 emissions as well as the acquisition of annual SO2 allowances.<br><br>The KRCDPP will comply with Title IV requirements as part of its Title V compliance (see below). |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 70 - Title V (Operating Permit Program) | SJVAPCD with review oversight by the USEPA | Need for a uniform nationwide operating permit program for major stationary sources. | Establishes a program for major stationary sources to have an operating permit, which identifies all federal requirements for emissions performance, operations, emissions monitoring and recordkeeping/reporting.<br><br>The KRCDPP will file a Title V permit application with the SJVAPCD within 12 months of initial operation. |
| Federal Clean Air Act, and implementing regulations, e.g., 40 CFR 63 – National Emissions Standards for Hazardous Air Pollutants (NESHAPs) | SJVAPCD with review oversight by the USUSEPA | Control of Hazardous Air Pollutants (HAPs) | Defines HAPs and sets emissions limits for major sources of HAPs.<br><br>The KRCDPP will not be a major source of HAPs. |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| **State** | | | |
| California Clean Air Act, Health & Safety Code 39000, et seq. | SJVAPCD with review oversight by CARB | Maintenance of NAAQS and CAAQS | Requires local air districts to either attain or maintain NAAQS and CAAQS.<br><br>The KRCDPP will comply with the requirements of the California CAA through its compliance with the SJVAPCD's NSR rule (see below). |
| State Implementation Plan (SIP), Health & Safety Code 39500, et seq. | SJVAPCD with review oversight by CARB | Attainment and maintenance of NAAQS | Requires local air districts to develop and implement regulations to either maintain compliance with NAAQS, or if in non-attainment, to reach attainment status.<br><br>The KRCDPP will comply with SIP requirements through its compliance with applicable SJVAPCD regulations (see below). |
| Toxic Air Contaminant Program, Health & Safety Code 39650, et seq. | CARB and the Office of Environmental Health Hazard Assessment (OEHHA) | Control of Toxic Air Contaminants (TACs) | Identifies TACs, as determined by state agencies, and develops control measures to limit their emissions.<br><br>There are no control measures developed under this program that are applicable to the KRCDPP. |
| Air Toxics Hot Spots Program, Health & Safety Code 44300, et seq. | SJVAPCD with review oversight by CARB | Control of TACs | Requires facilities with TAC emissions to identify and quantify these emissions and to perform a Health Risk assessment (HRA) based on the emissions identified. |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| | | | The KRCDPP will comply with these requirements by performing an HRA (see Section 5.8, Public Health). |
| **Local** | | | |
| Rule 2201, New and Modified Stationary Source Review Rule | SJVAPCD | Maintenance of NAAQS and CAAQS | For new and modified sources requires pre-construction review, including a Best Available Control Technology (BACT), an Air Quality Impact Assessment (AQIA) and emissions offsets.<br><br>The KRCDPP will comply with the requirements of this rule through its application of BACT, AQIA demonstration and acquisition of Emissions Reduction Credits (ERCs). |
| Rule 2520, Federally Mandated Operating Permits | SJVAPCD | Need for a uniform nationwide operating permit program for major stationary sources. | Establishes a permitting program for applicable sources to comply with all federal requirements for emissions performance, operations, emissions monitoring and recordkeeping/reporting.<br><br>The KRCDPP will file a Title V permit application with the SJVAPCD within 12 months of initial operation. |
| Rule 2540, Acid Rain Program | SJVAPCD | Reduction of impacts due to acidic rain | Requires monitoring of both NOx and SO2 emissions as well as the acquisition of annual SO2 allowances.<br><br>The KRCDPP will comply with Title IV requirements |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| | | | as part of its Title V compliance (see below). |
| Rule 4001, New Source Performance Standards | SJVAPCD | Maintenance of NAAQS | Limits the emissions from specific source categories.<br><br>The KRCDPP will comply with the requirements of this rule through its application of application of BACT. |
| Rule 4002, National Emissions Standards for Hazardous Air Pollutants | SJVAPCD | Hazardous Air Pollutants | Imposes controls and limits the emissions of HAPs for major sources.<br><br>The KRCDPP will not be a major source of HAPs. |
| Rule 4101, Visible Emissions | SJVAPCD | Control of visible air emissions | Limits the opacity of air emissions.<br><br>The KRCDPP will comply with the requirements of this rule through the use of natural gas fuel. |
| Rule 4102, Nuisance | SJVAPCD | Control of air emissions that may cause injury or annoyance | Prevents the emitting of substances that would result in injury or serve as a nuisance to the public.<br><br>The KRCDPP will comply with the requirements of this rule through its AQIA. |
| Rule 4201, Particulate Matter Concentration | SJVAPCD | Control of particulate emissions | Limits the concentration of particulate emissions.<br><br>The KRCDPP will comply with the requirements of this rule through the use of natural gas fuel. |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| Rule 4202, Particulate Matter Emission Rate | SJVAPCD | Control of particulate emissions | Limits the rate of particulate emissions.<br><br>The KRCDPP will comply with the requirements of this rule through the use of natural gas fuel. |
| Rule 4301, Fuel Burning Equipment | SJVAPCD | Control of emissions from fuel burning equipment | Limits emissions of various pollutants.<br><br>The KRCDPP will comply with the requirements of this rule through the implementation BACT. |
| Rule 4703, Stationary Gas Turbines | SJVAPCD | Control of emissions from stationary gas turbines | Limits the emissions of various pollutants from stationary gas turbines.<br><br>The KRCDPP will comply with the requirements of this rule through the implementation BACT. |
| Rule 4801, Sulfur Compounds | SJVAPCD | Control of sulfur compound emissions | Limits the amount of SO2 emitted in sulfur compound emissions.<br><br>The KRCDPP will comply with the requirements of this rule through the use of natural gas fuel. |
| Rule 8011, General Requirements | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| Rule 8021, Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |
| Rule 8041, Carryout and Trackout | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |
| Rule 8051, Open Areas | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |
| Rule 8061, Paved and Unpaved Roads | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |

| Table 5.1-4<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Air Quality Concern** | **Description/Project Applicability** |
| Rule 8071, Unpaved Vehicle/Equipment Traffic Areas | SJVAPCD | Control of fugitive dust | Limits fugitive dust emissions through the imposition of mitigation.<br><br>The KRCDPP will comply with the requirements of this rule through implementation of the mitigation measures for fugitive dust from construction. |

#### *5.1.3.1Required Permits and Agency Contacts*

The regulatory agencies responsible for ensuring the maintenance of air quality and for implementing the LORS addressed previously in Table 5.1-4 are listed in Table 5.1-5. The permits required are shown in Table 5.1-6.

**Table 5.1-5**
**Agency Contacts – Air Quality**
**KRCDPP**

| Agency | Telephone |
|---|---|
| USEPA, Region IX<br>75 Hawthorne Street<br>San Francisco, CA 94105 | (415) 947-8000 |
| CARB<br>1001 "I" Street<br>PO Box 2815<br>Sacramento, CA 95812 | (916) 322-2990 |
| SJVAPCD – Fresno Office<br>1990 E. Gettysburg Avenue<br>Fresno, CA 93726 | (916) 230-6000 |

**Table 5.1-6**
**Required Permits – Air Quality**
**KRCDPP**

| Permit | Regulatory/ Administering Agency | Schedule |
|---|---|---|
| Authority To Construct (ATC) | SJVAPCD | The ATC application for the KRCDPP will be filed in December 2003 and will be obtained in parallel with the Small Power Plant Exemption from the California Energy Commission (CEC), i.e., prior to construction. |
| Federal Operating (Title V) Permit | SJVAPCD | The application will be filed no later than 12 months after initial operation and permit to be obtained subsequently. |
| Acid Rain (Title IV) Permit | SJVAPCD | The permit will be obtained as part of Title V permit. |

### 5.1.4 Environmental Consequences

#### *5.1.4.1 Environmental Checklist*

Table 5.1-7 is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant air quality impacts.

| Table 5.1-7<br>CEQA Environmental Checklist –Air Quality<br>KRCDPP | | | | |
|---|---|---|---|---|
| **AIR QUALITY –<br>Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| a) Conflict with or obstruct implementation of the applicable air quality plan? | | | X | |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | | X | | |
| c) Result in a cumulative considerable net increase of any criteria pollutant for which the project region is non-attainment under the applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)? | | X | | |
| d) Expose sensitive receptors to substantial pollutant concentrations? | | X | | |
| e) Create objectionable odors affecting a substantial number of people? | | | X | |

### *5.1.4.2 Criteria Pollutant Emissions*

The KRCDPP will use natural gas as its only fuel. Table 5.1-8 provides the anticipated natural gas fuel composition. Emissions of criteria pollutants from the KRCDPP include NOx, CO, VOCs, PM10 and SO2, which are products of natural gas combustion in the CTs as well as relatively small amounts of PM10 emissions from the cooling towers and ZLD evaporative tower. Natural gas firing in the CTs results in relatively minor emissions of VOCs, PM10 and SO2. Conversely, emissions of NOx and CO, if uncontrolled, can be large. However, as described in Appendix 5.1-2 (BACT Analysis), the KRCDPP CTs will use Selective Catalytic Reduction (SCR) and an oxidation catalyst to minimize emissions of NOx and CO, respectively. The chiller cooling towers and ZLD tower emissions of PM10 result from solids being carried away from these towers as part of their drift, i.e., un-evaporated water. These drift emissions are minor and the cooling tower is not subject to BACT requirements. The ZLD tower includes a baghouse filter as BACT for PM10 emissions. Table 5.1-9 summarizes the proposed BACT for the KRCDPP.

| TABLE 5.1-8<br>Natural Gas Fuel Composition<br>KRCDPP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Methane** | **Ethane** | **Propane** | **I_Butane** | **N_Butane** | **I_Pentane** | **N_Pentane** | **C6** | **N2** | **Carbon Dioxide** |
| 94.96% | 3.28% | 0.11% | 0.01% | 0.02% | 0.00% | 0.00% | 0.00% | 0.93% | 0.68% |

Notes:
1. Sulfur content reported as 5 ppm, which is equivalent to 0.3 grains/100 standard cubic feet (scf). However, for emission calculations the KRCDPP assumes 0.41 grains/100 scf. Energy content = 1025.9 million British thermal units per standard cubic feet higher heating value BTU/scf (HHV)
2. Specific Gravity = 0.5829
3. Data is for PG&E L400 (6/96-7/00)

| Table 5.1-9<br>Summary of Proposed BACT for the CTs<br>KRCDPP | | |
|---|---|---|
| | **Proposed BACT** | **Proposed Emission Limitation** |
| NOx | SCR | 3.0 ppmvd[1] |
| VOCs | Oxidation Catalyst | 2.0 ppmvd[1] |
| PM10[2] | Use of Natural Gas Fuel | 0.0073 lbs/MMBtu (HHV) |
| SO2 | Use of Natural Gas Fuel | 0.00114 lbs/MMBtu (HHV)[3] |
| CO | NA[4] | 6.0 ppmvd[1] |

Notes:
1. ppmvd referenced at 15% oxygen.
2. BACT for the ZLD evaporative tower will be a baghouse filter, limiting PM10 emissions to no more than 0.06 lbs/hr.
3. Based on a fuel sulfur content of 0.41 grains/100 scf.
4. Although the KRCDPP does not trigger BACT for CO, these emissions will be controlled through the use of an oxidation catalyst.

Acronyms:
MMBtu/HHV - million British thermal units per hour higher heating value
lbs –pounds
ppmvd - parts per million by volume dry

### Emissions Rates - Operations

Three operating modes need to be considered when determining worst-case emissions levels: normal or steady-state operations (under a number of ambient conditions and operating modes), startup/shutdown mode, and the initial commissioning period.

**Steady-State**

For projects of this type, normal operations often include both full and partial load operating levels. However, no partial load operation of the KRCDPP CTs is expected due to the small size of these units relative to the size of the PG&E electric grid, and the degraded fuel efficiency at part load. Each CT will either run at 100% load or be off.

Therefore, only full load steady-state operation was considered, and the following ten ambient/operational cases were examined to ensure that a wide range of possible emissions rates are considered:

- Case 1 – 25 ° F ambient, chillers – off, dilution air – off
- Case 2 – 25 ° F ambient, chillers – off, dilution air – on
- Case 3 – 62 ° F ambient, chillers – on, dilution air – off
- Case 4 – 62 ° F ambient, chillers – on, dilution air – on
- Case 5 – 62 ° F ambient, chillers – off, dilution air – off
- Case 6 – 62 ° F ambient, chillers – off, dilution air – on
- Case 7 – 103 ° F ambient, chillers – on, dilution air – off
- Case 8 – 103 ° F ambient, chillers – on, dilution air – on
- Case 9 – 103 ° F ambient, chillers – off, dilution air – off
- Case 10 – 103 ° F ambient, chillers – off, dilution air - on

Note that for purposes of determining mass emissions rates, only five of the ten cases shown above are necessary, as the inclusion/exclusion of dilution air does not affect the mass emissions rates. However, the full ten cases were needed to assess potential impacts (as described below in the air quality impact section).

The 5 sets of steady-state (full load) emissions rates for the KRCDPP are shown in Appendix 5.1-3. Peak hourly emissions, based on the coldest ambient temperature, are represented by the emissions rates for Cases 1 & 2. Annual average emissions are represented by the emissions rates for Cases 3 & 4. Cases 7 & 8 represents the emissions rates at the maximum ambient temperature. The emissions rates for Cases 5 & 6 and Cases 9 & 10 assume abnormal operating conditions, i.e., inoperative chillers. Tables 5.1-10 and 5.1-11 provide the maximum hourly and average annual hourly emissions rates, respectively, which were derived from all ten potential cases.

**Table 5.1-10**
**Maximum Hourly Emissions Rates (in lbs/hr) – Steady – State Operation**
**KRCDPP**

| | One CT | Both CTs | One Cooling Tower[2] | Both Cooling Towers[2] | ZLD Evaporative Tower[2] | Totals |
|---|---|---|---|---|---|---|
| NOx[3] | 5.1 | 10.2 | NA | NA | NA | 10.2 |
| CO[4] | 6.2 | 12.4 | NA | NA | NA | 12.4 |
| VOCs[5] | 1.6 | 3.2 | NA | NA | NA | 3.2 |
| PM10 | 3.4[6] | 6.8 | 0.035 | 0.07 | 0.06 | 6.93 |
| SO2 | 0.53[7] | 1.05 | NA | NA | NA | 1.05 |

Notes:
1. Based on an ambient temperature of 25 ° F and the CT air inlet chillers off.
2. PM10 is the only emission from this equipment. Cooling Tower and ZLD emissions rates are from Tables 5.8-6 & 5.8-7, respectively, in Section 5.8, Public Health.
3. CT NOx emissions are based on water injection to 25 ppmdv @ 15% O2 and an approximately 88% effective SCR system to 3.0 ppmdv @ 15% oxygen (O2).
4. CT CO emissions are based on a pre-oxidation catalyst level of 49 ppmdv @ 15% O2 and an approximately 87-88% effective oxidation catalyst to 6.0 ppmdv @ 15% O2.
5. Based on an HC emissions rate of 8.0 lbs/hr for the 25 ° F ambient case and VOC = 0.20 HC.
6. Based on a total PM10 factor of 0.0073 lbs/MMBtu (filterable – front half = 0.0019 lbs/MMBtu (HHV); condensable – back half = 0.0047 lbs/MMBtu (HHV) and a safety margin of 10%) and a fuel input of 466.3 MMBtu/hr - HHV (420.1 MMBtu/hr – Lower heating value (LHV)).
7. Based on 0.41 grains /100 scf (from a typical fuel sulfur content of 5 ppmv, which is equivalent to 0.3 grains/100 scf, and a 35% safety margin), 1025.9 Btu (HHV)/scf and 466.3 MMBtu/hr.
lbs/hr - pounds per hour

| Table 5.1-11<br>Average Hourly Emissions Rates (lbs/hr) – Steady-State Operation<br>KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| | **One CT** | **Both CTs** | **One Cooling Tower[2]** | **Both Cooling Towers[2]** | **ZLD Evaporative Tower[2]** | **Totals** |
| NOx[3] | 5.1 | 10.2 | NA | NA | NA | 10.2 |
| CO[4] | 5.1 | 10.2 | NA | NA | NA | 10.2 |
| VOCs[5] | 1.4 | 2.8 | NA | NA | NA | 2.8 |
| PM10 | 3.4[6] | 6.8 | 0.035 | 0.07 | 0.06 | 6.93 |
| SO2[7] | 0.53 | 1.05 | NA | NA | NA | 1.05 |

Notes:
1. Based on an ambient temperature of 62 ° F and the CT air inlet chillers on.
2. PM10 is the only emission from this equipment. Cooling Tower and ZLD emissions rates are from Tables 5.8-6 & 5.8-7, respectively, in Section 5.8, Public Health.
3. CT NOx emissions are based on water injection to 25 ppmdv @ 15% O2 and an approximately 88% effective SCR system to 3.0 ppmdv @ 15% O2.
4. CT CO emissions are based on a pre-oxidation catalyst level of 41 ppmdv @ 15% O2 and an approximately 87-88% effective oxidation catalyst to approximately 5.0 ppmdv @ 15% O2.
5. Based on an HC emissions rate of 7.0 lbs/hr for the 62 ° F ambient case and VOC = 0.20 HC.
6. Based a total $PM_{10}$ factor of is 0.0073 lbs/MMBtu (filterable – front half = 0.0019 lbs/MMBtu (HHV); condensable – back half = 0.0047 lbs/MMBtu (HHV) and a safety margin of 10%) and a fuel input of 464.8 MMBtu/hr - HHV (418.7 MMBtu/hr – LHV).
7. Based on 0.41 grains S/100 scf (from a typical fuel sulfur content of 5 ppmv, which is equivalent to 0.3 grains/100 scf, and a 35% safety margin). Note the value given is based on maximum fuel input (25 ° F ambient).

### Startup/Shutdown

Startup and shutdown sequence emissions rates are shown in Table 5.1-12. These transient emissions rates, which take into account a multiple (failed) start sequence within one hour, are assumed to apply to all ambient/operational cases. The startup/shutdown emissions rates for the cooling towers and ZLD evaporative tower are assumed to be the same as those for steady-state. During startup and shutdown sequences of the two CTs, with the exception of NOx, emission rates of all criteria pollutants will be no greater than the maximum steady-state emissions rates.

| Table 5.1-12<br>Emissions Rates (in lbs/hr)<br>Startup/Shutdown Mode KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| | **One CT** | **Both CTs** | **One Cooling Tower[1]** | **Both Cooling Towers[1]** | **ZLD Evaporative Tower[1]** | **Totals** |
| NOx | 20 | 40 | NA | NA | NA | 40 |
| CO | 6.2[2] | 12.4 | NA | NA | NA | 12.4 |
| VOCs | 1.6[2] | 3.2 | NA | NA | NA | 3.2 |
| PM10 | 3.4[2] | 6.8 | 0.035 | 0.07 | 0.06 | 6.93 |
| SO2 | 0.53[2] | 1.05 | NA | NA | NA | 1.05 |

Notes:
1. The emissions rates for these pieces of equipment are the same as for steady-state operation. Cooling Tower and ZLD emissions rates are from Tables 5.8-6 & 5.8-7, respectively, in Section 5.8, Public Health Section.
2. This emissions rate is the same as for steady-state operation in the 25 ° F ambient case.

### Commissioning Period

Commissioning emissions rates, which will occur within the first month or two of KRCDPP operations, are shown in Table 5.1-13. These must be factored into the assessment of worst case emissions, as during this one-time commissioning period, emissions control equipment (i.e., the SCR and oxidation catalyst) will not be operational at all times. Subsequent first year impacts need not account for commissioning emissions, since the allowable steady-state operating hours of the KRCDPP will be reduced to the extent that commissioning emissions occur. The commissioning emissions rates for the cooling tower and ZLD evaporative tower are assumed to be the same as those for steady-state.

## Table 5.1-13
## Emissions Rates - Commissioning Mode
## KRCDPP

**CT Commissioning Emission Rates (lbs/hr) per CT[1]**

| Emission Factor | 4-Hour Full Speed No Load[4] Test | 20-Hour Minimum Load[4] Test | 24-Hour. Full Speed No Load[4] Test | 48-Hour Multiple Load[5] Test | Cooling Tower Commissioning Emissions Rates (lbs/hr) Per Cooling Tower[2] | ZLD Evaporative Tower Commissioning Emissions Rates (lbs/hr)[2] | Total Emissions From Commissioning (Tons)[3] Per CT |
|---|---|---|---|---|---|---|---|
| NOx[6] | 30.5 | 12.8 | 30.5 | 24.8 | NA | NA | 1.15 |
| CO[7] | 33.4 | 19.0 | 19.0 | 6.2 | NA | NA | 0.634 |
| VOCs[8] | 4.8 | 2.6 | 2.6 | 1.6 | NA | NA | 0.105 |
| PM10[9] | 3.4 | 3.4 | 3.4 | 3.4 | 0.035 | 0.06 | 0.167 |
| SO2[10] | 0.53 | 0.53 | 0.53 | 0.53 | NA | NA | 0.25 |

Notes:

1. Each of the two CTs will be commissioned separately. Therefore, when comparing commissioning emissions rates with other scenarios, assume only one CT in commissioning mode as compared with two CTs in steady-state or startup/shutdown mode. For PM10 the commissioning mode emissions rate, assume one CT plus one cooling tower plus 50% of the ZLD evaporative tower.
2. PM10 is the only emission from this equipment and the emissions rate is assumed as the same as for steady-state operation in the 25 °F ambient case.
3. Total commissioning emissions based on 4 hours of operation in the 4-hr FSNL mode; 20 hours of operation in the min. load mode; 24 hours of operation in the 24-hr full speed no load (FSNL) mode & 48 hours of operation in the multi-load mode.
4. Based on fuel consumption of 20% of maximum, i.e., 0.2 times 420.1 MMBtu/hr (HHV).
5. Based on maximum fuel consumption of 420.1 MMBtu/hr (HHV).
6. NOx emissions factors: 4-hr & 24-hr FSNL - 0.362 lbs/MMBtu; Min load – 0.152 lbs/MMBtu; Multi-load – 0.0589 lbs/MMBtu.
7. CO emissions factors: 4-hr FSNL - 0.3972 lbs/MMBtu; Min load & 24-hr FSNL– 0.2251 lbs/MMBtu; Multi-load – 0.0148 lbs/MMBtu.
8. VOC emissions factors: 4-hr FSNL - 0.0571 lbs/MMBtu; Min load & 24-hr FSNL– 0.0304 lbs/MMBtu; Multi-load – 0.0038 lbs/MMBtu.
9. PM10 emissions rates are assumed the same as for steady-state operation.
10. SO2 emissions rates are assumed the same as for steady-state operation.

**Maximum Emissions Rates – Operations**

Based on a review of the steady-state, startup/shutdown and commissioning emissions rates, the following operating scenarios provide the maximum short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) and annual emissions:

Maximum short-term emissions:

1-hour

- NOx – (40.0 lbs/hr) two CTs operating in startup/shutdown mode
- CO – (33.4 lbs/hr) one CT operating in commissioning mode
- VOCs – (4.8 lbs/hr) one CT operating in commissioning mode
- PM10 – (6.93 lbs/hr) both CTs operating in steady-state mode
- SO2 – (1.05 lbs/hr) both CTs operating in steady-state mode

3-hour

- NOx – (30.5 lbs/hr x 3 hours) one CT operating in commissioning mode
- CO – (33.4 lbs/hr x 3 hours) one CT operating in commissioning mode
- VOCs – (4.8 lbs/hr x 3 hours) one CT operating in commissioning mode
- PM10 – (6.93 lbs/hr x 3 hours) both CTs operating in steady-state mode
- SO2 – (1.05 lbs/hr x 3 hours) both CTs operating in steady-state mode

8-hour

- NOx – (30.5 lbs/hr x 8 hours) one CT operating in commissioning mode
- CO – (19.0 lbs/hr x 8 hours) one CT operating in commissioning mode
- VOCs – (3.2 lbs/hr x 8 hours) both CTs operating for one hour in startup/shutdown mode and seven hours steady-state
- PM10 – (6.93 lbs/hr x 8 hours) both CTs operating in steady-state mode
- SO2 – (1.05 lbs/hr x 8 hours) both CTs operating in steady-state mode

24-hour

- NOx – (30.5 lbs/hr x 24 hours) one CT operating in commissioning mode
- CO – (19.0 lbs/hr x 24 hours) one CT operating in commissioning mode
- VOCs – (3.2 lbs/hr x 24 hours) both CTs operating for two hours in startup/shutdown mode and 22 hours steady-state
- PM10 – (6.93 lbs/hr x 24 hours) both CTs operating in steady-state mode
- SO2 – (1.05 lbs/hr x 24 hours) both CTs operating in steady-state mode

Annual emissions (based on 2,755 hour per year of both CTs at steady-state and 365 hour per year in startup/shutdown mode; both cooling towers and the ZLD evaporative tower operating for 3,120 hours per year):

- NOx – 21.33 tons per year
- CO – 19.35 tons per year
- VOCS – 4.99 tons per year
- PM10 – 10.91 tons per year
- SO2 – 1.65 tons per year

**Emissions Rates – Construction**

Air emissions resulting from the KRCDPP's construction phase were estimated to serve as a basis for the construction emissions impact assessment discussed later in this section. The emissions estimates for construction include equipment exhaust from construction equipment, delivery vehicles and worker travel as well as fugitive dust from windblown erosion and the movement of vehicles on the construction site. These estimates are included in Appendix 5.1-4.

### *5.1.4.3 Air Quality Impact Assessment*

**Assessment Methodology**

The impacts of KRCDPP emissions on air quality concentrations were calculated using the EPA Industrial Source Complex (ISCST3 version 02035) air dispersion model. The ISCST3 model is a straight-line, steady-state Gaussian dispersion model, capable of calculating pollution concentrations from several different types of sources. The stack plume concentrations would be highest along the centerline of the plume, and decrease towards the plume edges. The ISCST3 model calculates concentrations through the plume including numerous factors: atmospheric stability, wind speed, terrain, nearby buildings, downwind distance, to name some examples. Required inputs to this model include stack parameters (for stack sources these include locations, stack heights, exit velocities, diameters, exit temperatures), emission rates, modeling options, receptor information, and meteorological data.

The modeling included emissions from the two CTs, two CT inlet air chiller cooling towers, and the ZLD evaporative tower. CT impacts calculated include those under Cases 1 through 10, start-up, and commissioning scenarios. The cooling towers and ZLD Tower emit only PM10. The stack parameters for these smaller pieces of equipment would remain the same throughout the year.

Stack parameters input to the ISCST3 model for the different modeling scenarios are listed in Table 5.1-14.

**Table 5.1-14**
**Stack Parameters**
**KRCDPP**

| Case | Source | Height meters | Stack diameter meters | Exit velocity Meters per second | Temperature °Kelvin |
|---|---|---|---|---|---|
| | Cool tower (per cell) | 10.67 | 3.66 | 12.23 | 301.5 |
| | ZLD | 21.33 | 0.30 | 8.02 | 463.7 |
| **1** | **25°chillers off, dilution off** | | | | |
| | CT | 32.00 | 3.66 | 26.78 | 708.2 |
| **2** | **25°, chillers off, dilution on** | | | | |
| | CT | 32.00 | 3.66 | 27.88 | 672.0 |
| **3** | **62°, chiller on, dilution off** | | | | |
| | CT | 32.00 | 3.66 | 26.56 | 717.0 |
| **4** | **62°, chiller on, dilution on** | | | | |
| | CT | 32.00 | 3.66 | 28.07 | 672.0 |
| **5** | **62 °, chiller off, dilution off** | | | | |
| | CT | 32.00 | 3.66 | 25.96 | 720.4 |
| **6** | **62°, chiller off, dilution on** | | | | |
| | CT | 32.00 | 3.66 | 27.54 | 672.0 |
| **7** | **103°, chiller on, dilution off** | | | | |
| | CT | 32.00 | 3.66 | 26.56 | 717.0 |
| **8** | **103° chiller on, dilution on** | | | | |
| | CT | 32.00 | 3.66 | 28.26 | 672.0 |
| **9** | **103°, chiller off, dilution off** | | | | |
| | CT | 32.00 | 3.66 | 22.84 | 723.2 |
| **10** | **103°, chiller off, dilution on** | | | | |
| | CT | 32.00 | 3.66 | 24.49 | 672.0 |

The ISCST3 model was run using the default regulatory mode. The modeling analysis included downwash calculations. Downwash building height and width dimensions were computed using the EPA BPIP program (version 95086).

Receptors were spaced at 25 meter increments along the KRCDPP fence line. Receptor data for the remaining off-site receptors were obtained from Digital Elevation Model (DEM) data. These data have 30 meter spacing. Consequently, receptors were spaced at multiples of 30 meters: 30 meter increments out to approximately 450 meters from the

sources, 240 meter increments for approximately an additional 4600 meters, and 1020 meter increments for approximately an additional 4100 meters. Additional receptors were placed at elevated terrain located approximately 15 miles to the east and northeast of the KRCDPP project site, between elevations of 500 and 800 feet, to account for potential impacts of the plume at final rise under stable conditions, (F stability, wind speeds of 2.5 meters per second). Also, based on the results of initial modeling runs, receptors were spaced at 30 meter increments surrounding the locations of maximum impacts. Appendix 5.1-1 provides a figure, which illustrates the receptor locations used as input to the ISCST3 model.

The SJVAPCD provided meteorological data from Fresno airport from 1989 for the air quality analysis.

A sample ISCST3 input file is included in Appendix 5.1-1. Electronic versions of all modeling inputs are being provided separately.

**Fumigation Analysis**

Fumigation occurs when a stable layer of air is above the stack release height and unstable air is below. Under these circumstances, the plume can be mixed downward and potentially cause a high ground-level concentration.

The USEPA SCREEN3 model was used to calculate fumigation impacts. Stack parameters for the 10 operating scenarios were input to the model. The fumigation modeling results are summarized in the following section.

**AQIA Results**

Tables 5.1-15 and 5.1-16 summarize the modeling results from the ISCST3 and fumigation modeling of the combustion turbines. Table 5.1-15 presents the normalized concentrations (concentration/emission rate, also known as $\chi/Q$) for various averaging times. The highest 1-hour normalized impacts from the turbines were predicted under a fumigation regime under Case 9. For all other averaging periods (3-hour, 8-hour, 24-hour, and annual), the highest normalized impacts predicted by the ISCST3 model occurred under Case 9. Table 5.1-16 shows the concentrations for each pollutant under the various operating scenarios. These results are conservative, as they assume that during commissioning, both CTs could be operating, as well as both cooling towers and the ZLD. However during commissioning, the CTs would be operated separately, only one cooling tower would operate, and ZLD emissions would be reduced by 50 percent. Table 5.1-16a also contains the PM10 impacts from the CTs, cooling towers, and ZLD tower under Case 9. It is important to note that in Table 5.1-16b PM10 is not included as

part of the fumigation modeling results, as fumigation is associated with one-hour impacts and there is no one hour PM10 standard.

Table 5.1-17 summarizes the total KRCDPP impacts, including the highest measured background concentration for the most recent three years of data. The analysis shows that KRCDPP impacts would be below USEPA significance levels for all pollutants and thus would not be expected to cause or contribute to any violations of any AAQS.

**Table 5.1-15**
**Predicted Normalized Concentrations From CTs Under Various Operating Scenarios**
**KRCDPP**

| | ISCST3 (2 CTs) | | | | | | | | | | Fumigation (1 CT) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Case** | **Annual** | **Receptor** | **1-hour** | **Receptor** | **3-hour** | **Receptor** | **8-hour** | **Receptor** | **24-hour** | **Receptor** | **1-hour** | **Distance** |
| | ($\mu g/m^3$)/ (gm/sec) | UTM – E, UTM –N, elev. (meters) | ($\mu g/m^3$)/ (gm/sec) | UTM – E, UTM –N, elev. (meters) | ($\mu g/m^3$)/ (gm/sec) | UTM – E, UTM –N, elev. (meters) | ($\mu g/m^3$)/ (gm/sec) | UTM – E, UTM –N, elev. (meters) | ($\mu g/m^3$)/ (gm/sec) | UTM – E, UTM –N, elev. (meters) | ($\mu g/m^3$)/ (gm/sec) | Meters |
| 1 | 0.03478 | 263310.00, 4057380.00, 97.54 | 1.68715 | 256230.00, 4063950.00, 90.53 | 0.84545 | 255000.00, 4065150.00, 89.31 | 0.3464 | 263400.00, 4057320.00, 97.54 | 0.15994 | 259410.00, 4060350.00, 94.49 | 0.9563 | 19582 |
| 2 | 0.03474 | 263310.00, 4057380.00, 97.54 | 1.68731 | 256230.00, 4063950.00, 90.53 | 0.84562 | 255000.00, 4065150.00, 89.31 | 0.34525 | 263400.00, 4057320.00, 97.54 | 0.15972 | 259410.00, 4060350.00, 94.49 | 0.9553 | 19598 |
| 3 | 0.03476 | 263310.00, 4057380.00, 97.54 | 1.687 | 256230.00, 4063950.00, 90.53 | 0.84532 | 255000.00, 4065150.00, 89.31 | 0.34639 | 263400.00, 4057320.00, 97.54 | 0.15989 | 259410.00, 4060350.00, 94.49 | 0.956 | 19586 |
| 4 | 0.03449 | 263310.00, 4057380.00, 97.54 | 1.68632 | 256230.00, 4063950.00, 90.53 | 0.84485 | 255000.00, 4065150.00, 89.31 | 0.34304 | 263400.00, 4057320.00, 97.54 | 0.15898 | 259410.00, 4060350.00, 94.49 | 0.9509 | 19665 |
| 5 | 0.03553 | 263310.00, 4057380.00, 97.54 | 1.68992 | 256230.00, 4063950.00, 90.53 | 0.84753 | 255000.00, 4065150.00, 89.31 | 0.35292 | 263400.00, 4057320.00, 97.54 | 0.16209 | 259410.00, 4060350.00, 94.49 | 0.969 | 19394 |
| 6 | 0.03515 | 263310.00, 4057380.00, 97.54 | 1.68915 | 256230.00, 4063950.00, 90.53 | 0.84702 | 255000.00, 4065150.00, 89.31 | 0.34927 | 263400.00, 4057320.00, 97.54 | 0.16109 | 259410.00, 4060350.00, 94.49 | 0.9633 | 19477 |
| 7 | 0.03476 | 263310.00, 4057380.00, 97.54 | 1.687 | 256230.00, 4063950.00, 90.53 | 0.84532 | 255000.00, 4065150.00, 89.31 | 0.34639 | 263400.00, 4057320.00, 97.54 | 0.15989 | 259410.00, 4060350.00, 94.49 | 0.956 | 19586 |
| 8 | 0.03431 | 263310.00, 4057380.00, 97.54 | 1.68534 | 256230.00, 4063950.00, 90.53 | 0.84409 | 255000.00, 4065150.00, 89.31 | 0.34085 | 263400.00, 4057320.00, 97.54 | 0.15824 | 259410.00, 4060350.00, 94.49 | 0.9465 | 19732 |
| 9 | 0.04076 | 260160.00, 4059870.00, 94.49 | 1.82479 | 256110.00, 4064400.00, 90.83 | 0.86371 | 255000.00, 4065120.00, 89.31 | 0.4301 | 257580.00, 4064400.00, 92.96 | 0.18258 | 259560.00, 4060290.00, 94.49 | 1.055 | 18215 |

**Table 5.1-15 (Continued)**
**Predicted Normalized Concentrations From CTs Under Various Operating Scenarios**
**KRCDPP**

| | ISCST3 (2 CTs) | | | | | | | | | | Fumigation (1 CT) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Case** | **Annual** | **Receptor** | **1-hr** | **Receptor** | **3-hr** | **Receptor** | **8-hr** | **Receptor** | **24-hr** | **Receptor** | **1-hr** | **Distance** |
| 10 | 0.03996 | 260160.00, 4059840.00, 94.49 | 1.80634 | 256080.00, 4064400.00, 90.83 | 0.86198 | 255000.00, 4065120.00, 89.31 | 0.42888 | 257520.00, 4064400.00, 92.96 | 0.17515 | 259260.00, 4060470.00, 94.18 | 1.044 | 18366 |
| Max | 0.04076 | | 1.82479 | | 0.86371 | | 0.4301 | | 0.18258 | | 1.055 | |

**Table 5.1-16a**
**Project Impacts – ISCST3 Modeling**
**KRCDPP**

**ISCST3 - 2 CTs**

| | NO2 | | | CO | | | PM10 | | | SO2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Emissions (in gm/sec) | Concentrations (in ug/m3) | | Emissions (in gm/sec) | Concentrations (in ug/m3) | | Emissions (in gm/sec) | Concentrations (in ug/m3) | | Emissions (in gm/sec) | Concentrations (in ug/m3) | | | |
| Case | | 1 hour | Annual | | 1 hour | 8 hour | | 24 hour | Annual | | 1 hour | 3 hour | 24 hour | Annual |
| 1 | 0.64 | 1.08 | | 0.78 | 1.32 | 0.27 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 2 | 0.64 | 1.08 | | 0.78 | 1.32 | 0.27 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 3 | 0.64 | 1.08 | | 0.64 | 1.08 | 0.22 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 4 | 0.64 | 1.08 | | 0.64 | 1.08 | 0.22 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 5 | 0.63 | 1.06 | | 0.50 | 0.85 | 0.18 | 0.42 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 6 | 0.63 | 1.06 | | 0.50 | 0.85 | 0.18 | 0.42 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 7 | 0.64 | 1.08 | | 0.64 | 1.08 | 0.22 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 8 | 0.64 | 1.08 | | 0.64 | 1.08 | 0.22 | 0.43 | 0.07 | | 0.07 | 0.11 | 0.06 | 0.01 | |
| 9 | 0.52 | 0.94 | | 0.19 | 0.34 | 0.08 | 0.35 | 0.06 | | 0.07 | 0.12 | 0.06 | 0.01 | |
| 10 | 0.52 | 0.93 | | 0.19 | 0.34 | 0.08 | 0.35 | 0.06 | | 0.07 | 0.12 | 0.06 | 0.01 | |
| Start-up | 2.52 | 4.60 | | 0.78 | 1.43 | 0.34 | 0.43 | 0.08 | | 0.07 | 0.12 | 0.06 | 0.01 | |
| Commis -sion | 3.84 | 7.01 | | 4.21 | 7.68 | 1.81 | 0.43 | 0.08 | | 0.07 | 0.12 | 0.06 | 0.01 | |
| Annual | 0.31 | | 0.01 | n/a | | | 0.15 | | 0.01 | 0.02 | | | | 0.001 |
| CTs+Cooling Tower+ ZLD | | | | | | | | 1.47 | 0.26 | | | | | |

| Table 5.1-16b<br>Project Impacts – Fumigation Modeling<br>KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| **Fumigation – 2 CTs – 1-hour** | | | | | | |
| | **NO2** | | **CO** | | **SO2** | |
| **Case** | **Emissions per CT (In gm/sec)** | **Concentration (in µg/m$^3$)** | **Emissions per CT (in gm/sec)** | **Concentration (in µg/m$^3$)** | **Emissions per CT (in gm/sec)** | **Concentration (in µg/m$^3$)** |
| 1 | 0.64 | 1.23 | 0.78 | 1.49 | 0.07 | 0.13 |
| 2 | 0.64 | 1.23 | 0.78 | 1.49 | 0.07 | 0.13 |
| 3 | 0.64 | 1.23 | 0.64 | 1.23 | 0.07 | 0.13 |
| 4 | 0.64 | 1.22 | 0.64 | 1.22 | 0.07 | 0.13 |
| 5 | 0.63 | 1.22 | 0.50 | 0.98 | 0.07 | 0.13 |
| 6 | 0.63 | 1.21 | 0.50 | 0.97 | 0.07 | 0.13 |
| 7 | 0.64 | 1.23 | 0.64 | 1.23 | 0.07 | 0.13 |
| 8 | 0.64 | 1.22 | 0.64 | 1.22 | 0.07 | 0.13 |
| 9 | 0.52 | 1.09 | 0.19 | 0.40 | 0.07 | 0.14 |
| 10 | 0.52 | 1.08 | 0.19 | 0.39 | 0.07 | 0.14 |
| Start-up | 2.52 | 5.32 | 0.78 | 1.65 | 0.07 | 0.14 |
| Commissioning | 3.84 | 8.11 | 4.21 | 8.88 | 0.07 | 0.14 |

**Table 5.1-17**
**Total Project Impacts**
**KRCDPP**

| Pollutant | Averaging Period | Significance Level ($\mu g/m^3$) | Concentration ($\mu g/m^3$) | UTM E (meters) | UTM N (meters) | Elevation (meters) | Background Concentration ($\mu g/m^3$) | Total Impacts ($\mu g/m^3$) | CAAQS ($\mu g/m^3$) | NAAQS ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|
| $NO_2$ | 1 | | 8.1 | 18215 | -- | -- | 169 | 177 | 470 | |
| | Annual | 1.0 | 0.01 | 260160.00 | 4059870.00 | 94.49 | 43 | 43 | -- | |
| CO | 1 | 2000 | 8.9 | 18215 | -- | -- | 10285 | 10294 | 23,000 | 40,000 |
| | 8 | 500 | 1.8 | 257580.00 | 4064400.00 | 92.96 | 4880 | 4882 | 10,000 | 10,000 |
| SO2 | 1 | | 0.14 | 18215 | -- | -- | 78 | 78 | 650 | -- |
| | 3 | 25 | 0.06 | 255000.00 | 4065120.0 | 89.31 | 78 | 78 | -- | 1300 |
| | 24 | 5 | 0.01 | 259560.00 | 4060290.00 | 94.49 | 16 | 16 | 105 | 365 |
| | Annual | 1 | 0.001 | 260160.00 | 4059870.00 | 94.49 | 8 | 8 | -- | 80 |
| PM10 | 24 | 5.0 | 1.5 | 259560.00 | 4060290.00 | 94.49 | 186 | 188 | 50 | 150 |
| | Annual | 1.0 | 0.3 | 260160.00 | 4059870.00 | 94.49 | 52 | 52 | 20 | 50 |

[1]Maximum 1-hour impacts occurred under fumigation. The reported receptor is the downwind distance and is independent of direction.
UTM – Universal Transverse Mercator

**Construction Impacts**

The potential pollutant increases during construction were calculated, as previously discussed, and air dispersion modeling of construction emissions impacts was performed using the ISCST3 model. Detailed information regarding construction impacts may be found in Appendix 5.1-4. The results indicate that mitigated emissions will be of the same magnitude as similar projects, which when best available mitigation measures are applied do not cause significant impacts.

### 5.1.5 Proposed Mitigation Measures

During KRCDPP operations the emissions of criteria pollutants will be mitigated, as required by SJVAPCD regulations, through the imposition of BACT, which will minimize emissions at their source. These minimized emissions will be mitigated further through the acquisition of NOx, VOC, PM10 and SO2 emission reduction credits (ERCs).

The SJVAPCD requires the application of ERCs for projects, which exceed the following emissions thresholds: NOx – 10 tons per year; CO – 100 tons per year (in CO attainment areas); VOCs – 10 tons per year; PM10 – 14.6 tons per year; SO2 – 27.375 tons per year. Given the KRCDPP's relatively small size and limited hours of annual operation, the only offset requirements, that are imposed by SJVAPCD regulations, mandate the partial offsetting of NOx emissions, i.e., that portion of the KRCDPP's NOx emissions over 10 tons. However, the KRCDPP is required to obtain an SPPE from the CEC, which has responsibility for implementation of CEQA review.

In its capacity as the functional Lead Agency for CEQA, the CEC requires full offsetting of emissions of all pollutants, which are classified as non-attainment of either the NAAQS or CAAQS or which are pre-cursor pollutants with respect to non-attainment pollutants. Therefore, ERCs for NOx, VOC, PM10 and SO2 emissions from the KRCDPP will be provided on a 1 for 1 basis, resulting in the 100% offsetting of these emissions. Table 5.1-18 provides the ERC requirements by quarter and annually.

| Table 5.1-18<br>ERCs Required<br>KRCDPP | | | | | |
|---|---|---|---|---|---|
| | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter | Annual Totals |
| NOx | 3.88 | 3.40 | 10.61 | 3.44 | 21.33 |
| VOCs | 0.94 | 0.78 | 2.49 | 0.78 | 4.99 |
| PM10 | 2.06 | 1.71 | 5.44 | 1.72 | 10.91 |
| SO2 | .031 | 0.26 | 0.82 | 0.26 | 1.65 |

KRCD is in the process of locating the specific ERCs, which will be used to satisfy the offsetting requirements shown above, e.g., it is in the process of finalizing an exclusive option contract for the 10.91 tons of PM10. Procurement of the other ERCs is expected to be completed before the end of the first quarter of 2004. Once the necessary options and/or contracts are implemented, the CEC will be notified.

Mitigation measures will also be imposed by the KRCD during KRCDPP construction. These measures, which are presented in more detail in Appendix 5.1-4, include the use of low emitting diesel engines and ultra-low diesel fuel, regular preventive maintenance and a variety of fugitive dust mitigation measures.

### 5.1.6 Cumulative Impacts

As the results in Table 5.1-17 indicate, the KRCDPP's impacts of criteria pollutants, based on maximum emissions rates, are minor and below all of the USEPA significance (de minimis) levels. Therefore, the KRCDPP will not cause or significantly contribute to a violation of any AAQS, and it is reasonable to conclude that no significant cumulative impacts will result from KRCDPP implementation.

### 5.1.7 References

Aspen Environmental Group, 2003. E-mail from W. Walters transmitting TID Project revised construction impacts, September 10, 2003.

Aspen Environmental Group, 2003. E-mail from W. Walters transmitting non-road vehicle emissions, September 15, 2003.

California Health and Safety Code. Various sections. Website at: http://www.leginfo.ca.gov/calaw.html.

CARB, 1990. Summary of California Upper Air Meteorological Data. June.

CARB, 2001. ARB Fact Sheet: Air Pollution and Health. www.arb.ca.gov/research/health/fs/fs.htm. August 24.

CARB, 2002. California Ambient Air Quality Data 1980-2001, PTSD-02-017-CD. December 2002.

CARB, 2003. Website at: www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4.d2w/Branch. Retrieved November 15, 2003.

Modesto Irrigation District, 2003. Administrative Draft Application for a Small Power Plant Exemption. Prepared by CH2M Hill for Modesto Irrigation District. April 14, 2003.

San Joaquin Valley Air Pollution Control District, Rules and Regulations. Website at : www.valleyair.org

USEPA, 1995. SCREEN3 Model User's Guide. EPA-454/B-95-004. September, 1995.

USEPA, 2003a. www.epa.gov/air/urbanair/NOx/index.html. November 12.

USEPA, 2003b. www.epa.gov/air/urbanair/co/index.html. November 12.

USEPA, 2003c. www.epa.gov/air/urbanair/so2/index.html. November 12.

USEPA, 2003d. www.epa.gov/air/urbanair/pm/index.html. November 12.

# SECTION 5.2 NOISE

## 5.2.1 Introduction

This section provides an evaluation of the potential noise impacts associated with the construction and operation of the proposed Kings River Conservation District Peaking Plant (KRCDPP). The affected environment section provides a discussion of the fundamentals of noise, common noise sources, and a discussion of land uses in the project area. A discussion of conformance with applicable noise related policies and applicable federal, state and local laws, ordinances, regulations and standards (LORS) is also included. This section also includes an assessment of noise impacts associated with the construction and operation of the proposed KRCDPP.

## 5.2.2 Affected Environment

### *5.2.2.1 Fundamentals of Acoustics*

Noise is often defined as unwanted sound, and its perception can be characterized as a subjective reaction to a physical phenomenon. Researchers have grappled for many years with the problem of translating objective measurements of sound into directly correlated measures of public reaction to noise. The descriptors of community noise in current use are the results of these efforts, and represent simplified, practical measurement tools to gauge community response. Table 5.2-1 provides examples of maximum or continuous noise levels associated with common noise sources.

**Table 5.2-1**
**Typical A-Weighted Maximum Sound Levels of Common Noise Sources**
**KRCDPP**

| Decibels (dB) | Description |
|---|---|
| 130 | Threshold of pain |
| 120 | Jet aircraft take-off at 100 feet |
| 110 | Riveting machine at operators position |
| 100 | Shot-gun at 200 feet |
| 90 | Bulldozer at 50 feet |
| 80 | Diesel locomotive at 300 feet |
| 70 | Commercial jet aircraft interior during flight |
| 60 | Normal conversation speech at 5-10 feet |
| 50 | Open office background level |
| 40 | Background level within a residence |
| 30 | Soft whisper at 2 feet |
| 20 | Interior of recording studio |

A common statistical tool to measure the ambient noise level is the average sound level (Leq), which is the sound level corresponding to a steady-state A-weighted sound level in dB containing the same total energy as a time-varying signal over a given time period (usually one hour). There is a strong correlation between A-weighted sound levels and the way the human ear perceives noise. All noise levels reported in this section are in terms of A-weighted levels, unless otherwise described. Table 5.2-2 defines the acoustical terminology used in this report.

**Table 5.2-2**
**Acoustical Terminology**
**KRCDPP**

| | |
|---|---|
| **Acoustics** | The science of sound. |
| **Ambient Noise** | The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study. |
| **Attenuation** | The reduction of an acoustic signal. |
| **A-Weighting** | A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response. |
| **dB** | Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A dB is one-tenth of a Bell. |
| **CNEL** | Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7:00-10:00 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging. |
| **Frequency** | The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz). |
| **Ldn** | Day/Night Average Sound Level. Similar to CNEL but with no evening weighting. |
| **Leq** | Equivalent or energy-averaged sound level. |

| | |
|---|---|
| **Lmax** | The highest root-mean-square (RMS) sound level measured over a given period of time. |
| **L(n)** | The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period. |
| **Loudness** | A subjective term for the sensation of the magnitude of sound. |
| **Masking** | The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound. |
| **Noise** | Unwanted sound. |
| **Peak Noise** | The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level. |
| **$RT_{60}$** | The time it takes reverberant sound to decay by 60 dB once the source has been removed. |
| **Sabin** | The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin. |
| **Threshold of Hearing** | The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing. |
| **Threshold of Pain** | Approximately 120 dB above the threshold of hearing. |
| **Impulsive** | Sound of short duration, usually less than one second, with an abrupt onset and rapid decay. |
| **Simple Tone** | Any sound, which can be judged as audible as a single pitch or set of single pitches. |

The Leq, or average sound level, is the foundation for determining composite noise descriptors such as Ldn and CNEL (see below), and shows very good correlation with community response to noise.

The two composite noise descriptors commonly used are: Ldn and CNEL. The Ldn (Day-Night Average Level) is based upon the average hourly Leq over a 24-hour day, with a +10 dB weighting applied to nighttime (10 pm to 7 am) Leq values. The nighttime

penalty is based upon the assumption that people react to nighttime noise exposures as though they were subjectively twice as loud as daytime exposures. The CNEL, like Ldn, is based upon the weighted average hourly Leq over a 24-hour day, except that an additional +4.77 dB penalty is applied to evening (7 pm to 10 pm) hourly Leq values.

The CNEL was developed for the California Airport Noise Regulations, and is normally applied to airport/aircraft noise assessment. The Ldn descriptor is a simplification of the CNEL concept, but the two will usually agree, for a given situation, within 1 dB. Like the Leq, these descriptors are also averages and tend to disguise short-term variations in the noise environment. Because they presume increased evening or nighttime sensitivity, these descriptors are best applied as criteria for land uses where nighttime noise exposures are critical to the acceptability of the noise environment, such as residential developments.

The State of California "Model Community Noise Control Ordinance" suggests that hourly statistical noise level descriptors such as an exterior hourly L50, L90 or Leq noise level descriptors should be used for evaluating stationary noise sources. These hourly statistical noise level descriptors have been found to provide good correlation to stationary noise sources such as those associated with a power plant.

Another means of determining a potential noise impact is to assess a person's reaction to changes in noise levels due to a project. Table 5.2-3 is commonly used to show expected public reaction to changes in environmental noise levels. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 decibels "A" scale (dBA), as this is the usual range of voice and interior noise levels.

**Table 5.2-3**
**Subjective Reaction to Changes in Noise Levels of Similar Sources**
**KRCDPP**

| Change in Level, dBA | Subjective Reaction | Change in Acoustical Energy |
|---|---|---|
| 1 | Imperceptible (Except for Tones) | 1.3 |
| 3 | Just Barely Perceptible | 2.0 |
| 6 | Clearly Noticeable | 4.0 |
| 10 | About Twice (or Half) as Loud | 10.0 |

Source: Egan, 1988.

### 5.2.3 Project Area Setting

The proposed KRCDPP will be constructed, owned and operated by the Kings River Conservation District (KRCD). KRCD proposes to develop an approximately 97 MW natural gas-fired, peaking power plant to be located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. KRCD currently has an option to purchase approximately 19 acres of land. The KRCDPP site would consist of the southern 9.5 acres of the property. The northern 9.5 acres would be used for temporary construction staging and parking areas during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections, as discussed below. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, the KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect into the MCWD system at the intersection of North and Chestnut Avenues. The proposed interconnection for the

secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph.

### 5.2.4 Ambient Noise Environment

This section describes the zoning and surrounding land uses in the vicinity of the KRCDPP project site. In addition, this section also describes the existing noise environment based upon noise monitoring within the surrounding environment.

#### *5.2.4.1 Existing Land Uses*

The proposed KRCDPP will be located within Fresno County, and existing noise-sensitive uses, including residences and a church, are located within the near proximity of the proposed site, as described further in Section 5.5, Land Use. Figure 5.2-1 shows the project site and associated linear facilities and locations of sensitive receptors. Figure 5.5-2 shows noise contour information. Existing land uses in the vicinity of the project site include the following:

- Light industrial and warehousing to the north and west of Chestnut Avenue.
- Approximately 6 single family residential uses to the north and east of Chestnut Avenue. These residential uses are shown on Figures 5.2-1 and 5.2-2 as Receptor #4.
- Commercial, warehousing and light industrial uses are located to the west of the KRCDPP project site.
- Commercial, light industrial, motel and approximately 4 residential uses are located to the southwest, and on the opposite side of Golden State Boulevard. These residential uses are shown on Figures 5.2-1 and 5.2-2 as Receptor #5.
- Directly to the east and west of Chestnut Avenue are 5 residential uses. These residential uses are the nearest noise-sensitive uses to the project site

(approximately 1,000 feet from the center of the project site). These residential uses are shown on Figures 5.2-1 and 5.2-2 as Receptor #1.

- Warehousing and light industrial uses are located to the east and south of North Avenue.
- Approximately 6 residences and 1 church are located to the east and north of North Avenue. These residential uses are shown on Figures 5.2-1 and 5.2-2 as Receptor #2.
- A major subdivision is located to the southeast of the project site. These residential uses are shown on Figures 5.2-1 and 5.2-2 as Receptor #3.

#### *5.2.4.2 Existing Noise Environment*

The existing ambient noise environment in the vicinity of the project site is defined primarily by traffic on the local street network, including North Avenue, Chestnut Avenue, Golden State Boulevard and State Route 99. Other noise sources, which contribute to the background noise levels, include commercial and light industrial operations and railroad operations along the Union Pacific Railroad (UPRR).

To quantify existing background noise levels at the nearest residences to the project site, Bollard & Brennan, Inc. conducted continuous hourly noise measurements for a period of 25 hours at 3 locations on September 22-23, 2003. In addition, short-term noise level measurements were conducted during the daytime and nighttime periods at 2 locations. Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the noise level measurement survey. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4). Figures 5.2-1 and 5.2-2 show the locations of the noise measurement sites, which correspond to the Receptor numbers. The noise measurement results are shown in Table 5.2-4. Appendix 5.2-1 graphically shows the results of the continuous 25-hour noise monitoring results.

| Table 5.2-4<br>Summary of Background Noise Level Measurements<br>KRCDPP | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Site** | **Distance from Center of Project Site** | **Measured Hourly Noise Levels, dB*** | | | | | | |
| | | | **Daytime (7 am - 10 pm)** | | | **Nighttime (10 pm - 7 am)** | | |
| | | **Time** | **Leq** | **L50** | **L90** | **Leq** | **L50** | **L90** |
| 1 | 950 feet | 25-hours | 56 dBA | 52 dBA | 48 dBA | 57 dBA | 56 dBA | 53 dBA |
| 2 | 2,300 feet | 25-hours | 59 dBA | 53 dBA | 48 dBA | 56 dBA | 52 dBA | 50 dBA |
| 3 | 2,100 feet | 25-hours | 54 dBA | 51 dBA | 48 dBA | 55 dBA | 53 dBA | 50 dBA |
| 4 | 2,000 feet | 1:10 pm<br>10:15 pm | 58 dBA | 55 dBA | 52 dBA | 58 dBA | 56 dBA | 52 dBA |
| 5 | 2,100 feet | 2:30 pm<br>11:00 pm | 56 dBA | 52 dBA | 49 dBA | 57 dBA | 55 dBA | 53 dBA |
| * The reported daytime and nighttime hourly noise levels at each of the 25-hour continuous noise measurement sites represent the average of the quietest 4 consecutive hours of measured noise levels during the noise measurement period. | | | | | | | | |

Based upon the noise measurement results contained within Table 5.2-6, the typical daytime hourly L90 values at the 25-hour noise measurement sites were 48 dB. The typical nighttime hourly L90 values at the 25-hour noise measurement sites ranged between 50 dB and 53 dB. As discussed below, the background daytime and nighttime hourly Leq and L50 values are consistent with City and County noise level criteria discussed below and are also described within Tables 5.2-5 and 5.2-6, respectively. The background daytime and nighttime hourly noise levels at each of the 25-hour noise monitoring sites were determined based upon the average of the quietest 4 consecutive hours of measured noise levels during each of the noise measurement periods.

During field observations, it was noted that background noise levels were higher based upon atmospheric conditions, which contributed to increased noise associated with State Route 99.

### 5.2.5 Applicable Laws, Ordinances, Regulations, and Standards

The following are the noise-related applicable laws, ordinances, regulations that may be applicable to the proposed KRCDPP.

#### *5.2.5.1 Federal*

The federal government has no standards or regulations applicable to offsite noise levels from the KRCDPP.

Onsite noise levels are regulated, in a sense, through the Occupational Health and Safety Act of 1970 (OSHA). The noise exposure level of workers is regulated at 90 dBA, over an 8-hour shift to protect hearing (29 Code of Federal Regulations (CFR) 1910.95). The exposure of noise to an employee is referred to as the daily DOSE. The daily DOSE is calculated based upon the overall noise level and the daily number of hour of exposure. For instance, if an employee is exposed to a constant exposure of 95 dBA, the total time of allowed exposure is 4 hours. Areas above 85 dBA will be posted as high noise level areas and hearing protection will be required. Therefore, KRCD will be required to implement a hearing conservation program for applicable employees, and ensure that employees do not receive a daily DOSE of 90 dBA.

#### *5.2.5.2 State*

The only State of California noise level criteria, which may apply to the KRCDPP are those associated with occupational safety. The California Department of Industrial Relations, Division of Occupational Safety and Health enforces California Occupational Safety and Health Administration (Cal-OSHA) regulations, which are the same as the federal OSHA Regulations discussed above. The criteria and regulations are contained within California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

#### *5.2.5.3 Local*

**Fresno County**

The Fresno County General Plan Noise Element and Noise Ordinance establish noise level criteria for acceptable noise exposure for varying land uses. The criteria include 24-hour Ldn and hourly statistical noise level criteria during the daytime and nighttime periods.

In general, the 24-hour average, or Ldn noise level descriptor is used for evaluating transportation-related noise sources such as roadway traffic, aircraft operations, and to a lesser extent railroad operations. Hourly median (L50) and maximum noise level criteria are typically used for evaluating stationary on-site or non-transportation noise sources. For the purposes of this analysis, the Ldn criteria would only be applied to the evaluation of noise due to roadway traffic, and the hourly median (level not to be exceeded 30 minutes in any hour time period) and maximum (Lmax) criteria shall be used for evaluating noise levels associated with the KRCDPP. Table 5.2-5 provides the noise level criteria contained within the Fresno County Noise Element and Noise Ordinance.

| Table 5.2-5<br>Fresno County Noise Level Criteria<br>KRCDPP | | | | | |
|---|---|---|---|---|---|
| **Land Use** | **Ldn** | **Exterior Noise Level not to be Exceeded 30 minutes in any hour** | | **Interior Noise Maximum Noise Level Criterion** | |
| | | **Daytime L50 (7 am to 10 pm)** | **Nighttime L50 (10 pm to 7 am)** | **Daytime Lmax (7 am to 10 pm)** | **Nighttime Lmax (10 pm to 7 am)** |
| Residential and Churches | 60 dB | 50 dB | 45 dB | 55 dB | 45 dB |

**City of Fresno**

The City of Fresno General Plan establishes acceptable noise level criteria non-transportation noise sources such as those associated with the proposed KRCDPP.

For noise due to non-transportation noise sources, or stationary noise sources, such as those associated with commercial land uses, the City of Fresno establishes hourly noise level performance criteria. Table 5.2-6 shows the hourly noise level performance criteria.

| Table 5.2-6<br>City of Fresno<br>Maximum Allowable Noise Exposure-Stationary Sources[1] | | |
|---|---|---|
| | **Daytime (7 am to 10 pm)** | **Nighttime (10 pm to 7 am)** |
| Hourly Equivalent Sound Level (Leq) | 50 dB | 45 dB |
| Maximum Sound Level ($L_{max}$) | 70 dB | 65 dB |
| [1]As determined at outdoor activity areas. Where the location of outdoor activity areas is unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus 5 dB. | | |

**City of Fresno Noise Ordinance Requirements:**

The following sections of the City of Fresno Municipal Code (Noise Regulations) pertain to the proposed KRCDPP.

SECTION 8-305. EXCESSIVE NOISE PROHIBITED. No person shall make, cause, or suffer or permit to be made or caused upon any premises or upon any public street, alley, or place within the city, any sound or noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing or working in the area, unless such noise or sound is specifically authorized by or in accordance with this article.

SECTION 8-306. PRIMA FACIE VIOLATION. Any noise or sound exceeding the ambient noise level at the property line of any person offended thereby, or, if a condominium or apartment house, within any adjoining living unit, by more than five decibels shall be deemed to be prima facie evidence of a violation of Section 8-305.

### 5.2.6 Environmental Consequences

#### *5.2.6.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant noise impacts. This section discusses the potential for significant impacts associated with construction or O&M of the proposed KRCDPP in relation to the checklist questions in Table 5.2-7, below.

**Table 5.2-7**
**CEQA Environmental Checklist –Noise**
**KRCDPP**

| | **Potentially Significant Impact** | **Less than Significant with Mitigation Incorporated** | **Less than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **NOISE– Would the Project Result in:** | | | | |
| a) Exposure of person to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of the agencies. | | | X | |
| b) Exposure of persons to or generation of excessive ground-borne vibration levels. | | | | X |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. | | | | X |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. | | | X | |
| e) Exposure of residents or people working in the area to excessive noise levels (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 use airport). | | | | X |

| Table 5.2-7<br>CEQA Environmental Checklist –Noise<br>KRCDPP | | | | |
|---|---|---|---|---|
| | **Potentially Significant Impact** | **Less than Significant with Mitigation Incorporated** | **Less than Significant Impact** | **No Impact** |
| **NOISE– Would the Project Result in:** | | | | |
| f) Exposure of residents or people working in the area to excessive noise levels (for a project within the vicinity of a private air strip). | | | | X |

### *5.2.6.2 Determination of a Significant Increase in Noise Levels*

Table 5.2-3 above, describes the subjective reaction to changes in noise levels. The Fresno County General Plan Noise Element does not provide for an adjustment to the stationary noise level criteria, based upon elevated background noise levels. The City of Fresno Noise Element and Noise Ordinance does provide for an incremental increase in allowable noise based upon the determination of background noise levels. The City of Fresno criteria allow for an ambient plus 5 dB for new projects.

Discussions with the California Energy Commission (CEC) indicate that they consider a significant increase in noise levels to be the ambient noise environment (defined by the average of the measured quietest 4 consecutive hours) plus 10 dB, based upon the measured L90 noise level descriptor (Baker, 2003).

### *5.2.6.3 Discussion of Impacts*

**Construction Noise Impacts**

During the construction phases of the KRCDPP, noise from construction activities will dominate the noise environment in the immediate area. Activities involved in construction will generate noise levels, as indicated in Table 5.2-11, ranging from 70 to 90 dBA at a distance of 50 feet. During construction, mobile equipment on the project site and on local roadways can be a major noise source. The mobile equipment is generally transporting heavy materials and construction equipment. These types of noise sources and levels are typical for projects of this nature. Construction activities will be temporary in nature, typically occurring during normal working hours. At nighttime, construction noise impacts could be significant, and could result in annoyance or sleep disruption for nearby residences.

| Table 5.2-11<br>Construction Equipment Noise<br>KRCDPP | |
|---|---|
| **Type of Equipment** | **Maximum Level, dBA at 50 feet** |
| Scrapers | 88 |
| Bulldozers | 87 |
| Heavy Trucks | 88 |
| Backhoe | 85 |
| Pneumatic Tools | 85 |
| Source: Cunniff, 1977. | |

If construction is limited to the daytime hours (7 am to 10 pm), it is expected that the noise impacts will not be significant. Typical hourly average noise levels due to construction are expected to be up to 75 dBA Leq at a distance of 50 feet. Therefore, residences in the vicinity of the nearest residences to the site could experience noise levels in excess of 60 dBA Leq.

Since the construction phases of the KRCDPP and its associated linear facilities will occur during the daytime hours, and will be temporary in nature, it is not expected that the noise impacts associated with the construction will be significant.

**Operational Noise Impacts**

As a means of predicting noise levels associated with the KRCDPP operations, Bollard & Brennan, Inc. used the computer based "Environmental Noise Model" (ENM). The ENM is capable of projecting the locations of noise contours for multiple noise sources, while accounting for natural topography, ground type, atmospheric conditions, noise source directionality, height of the noise sources, and frequency content of the noise sources.

Inputs to the ENM were obtained from United States Geological Survey (USGS) topographic maps of the area. Other inputs to the ENM included temperature and the relative humidity. In addition, existing buildings in the vicinity of the project site were digitized into the model to account for shielding. Noise level and sound power data were based upon information provided by manufacturers of specific equipment.

The primary noise sources associated with the proposed project site include the following:

- Gas Steam Turbine Generator (2);
- Stack (2);
- Gas Compressor (2);

- Transformer (2);
- Cooling Tower (2);
- Turbine Blower (2);

Octave band sound power levels, which were used for direct inputs to the ENM for each individual piece of equipment, are contained within Table 5.2-8.

**Table 5.2-8**
**ENM Input Sound Power Levels**
**KRCDPP**

| Component | Linear Octave Band Center Frequency, Hertz (Hz) in dB | | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|---|
| | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Stack Unsilenced | 137 | 138 | 137 | 140 | 137 | 126 | 122 | 120 | 109 | |
| DIL | -6 | -3 | -1 | -- | -- | -- | -- | -- | -- | |
| Directivity @90° | -2 | -3 | -4 | -6 | -8 | -10 | -12 | -14 | -16 | |
| ENM Input | 129 | 132 | 132 | 134 | 129 | 116 | 110 | 106 | 93 | 129 |
| Stack Silenced | 137 | 138 | 137 | 140 | 137 | 126 | 122 | 120 | 109 | |
| DIL | -4 | -7 | -15 | -27 | -35 | -33 | -29 | -17 | -2 | |
| Directivity @90° | -2 | -3 | -4 | -6 | -8 | -10 | -12 | -14 | -16 | |
| ENM Input | 131 | 128 | 118 | 107 | 94 | 83 | 81 | 89 | 91 | 106 |
| Turbine Generator | 120 | 115 | 108 | 104 | 95 | 78 | 74 | 72 | 61 | 99 |
| Transformer | 108 | 111 | 105 | 105 | 100 | 94 | 91 | 88 | 88 | 102 |
| Compressor | 74 | 86 | 85 | 89 | 94 | 87 | 88 | 83 | 79 | 95 |
| Cooling Tower | 90 | 106 | 103 | 97 | 91 | 88 | 84 | 80 | 80 | 99 |
| Turbine Blower | 80 | 87 | 96 | 98 | 94 | 93 | 91 | 78 | 67 | 98 |

Acronyms :
DIL – Diffuser Insertion Loss

The ENM was used for determining overall noise levels at the nearest receiver locations, which are identified on Figure 5.2-1. The nearest receiver locations also coincide with the noise monitoring locations. The ENM input the coordinates of each receiver, and point source calculations of noise levels were conducted at each of the receiver locations. The noise level calculations were conducted for two scenarios. The scenarios included the KRCDPP operating with unsilenced turbine exhaust stacks, and the KRCDPP operating with silencer packages on each of the turbine exhaust stacks. Since the noise levels associated with KRCDPP operations are generally steady-state in nature, it is assumed that the hourly L90, L50 and Leq noise levels are approximately the same.

Table 5.2-9 provides the point source calculations for each of the receiver locations for both the unsilenced stack operations, and for operations with silencer packages on the

turbine exhaust stacks. The rankings for each of the noise sources are shown in Appendix 5.2-2 of this analysis.

| Table 5.2-9<br>ENM Predicted KRCD Operations Single Point Noise Level Calculations<br>KRCDPP | | | |
|---|---|---|---|
| **Receiver Location** | **Land Use** | **Unsilenced Stack Noise Levels** | **Stack Silencer Packages** |
| R1 | Residential | 69.2 dBA | 51.2 dBA |
| R2 | Church | 58.4 dBA | 36.4 dBA |
| R3 | Residential | 59.8 dBA | 43.2 dBA |
| R4 | Residential | 62.9 dBA | 34.9 dBA |
| R5 | Residential | 65.0 dBA | 47.4 dBA |
| Source: Bollard & Brennan, Inc., 2003 | | | |

Noise levels produced by the proposed KRCDPP are anticipated to result in increased annoyance during the nighttime period. This is due to the fact that people generally more sensitive to increases in noise levels during the time periods when they are resting or sleeping. This analysis will focus on the overall increase in noise levels due to KRCDPP operations during the nighttime periods.

Tables 5.2-10 and 5.2-11 provide a comparison of the predicted noise levels associated with the proposed KRCDPP to the measured existing nighttime background noise levels previously described in this report. The comparison of noise levels is provided for scenarios with the KRCDPP operating with and without the turbine exhaust stack silencers.

It is important to keep in mind that the hourly L90 descriptor is used within this report for comparison to the CEC noise level standards of significance. The hourly L50 descriptor is used in this report for comparison to the Fresno County noise level criteria. The hourly Leq descriptor is used in this report for comparison to the City of Fresno noise level criteria.

| Table 5.2-10<br>Comparison of Measured Nighttime Background Noise Levels to Predicted KRCDPP Noise Levels Without Silencers on the Exhaust Stacks<br>KRCDPP | | | | | | | |
|---|---|---|---|---|---|---|---|
| Receiver Location | Predicted KRCDPP Noise Levels, dBA | Measured Background Noise Levels, dBA | | | Predicted Increase in Background Noise Levels, dBA | | |
| | | Leq | L50 | L90 | Leq | L50 | L90 |
| R1 | 69.2 | 57 | 56 | 53 | +12.2 | +13.2 | +16.2 |
| R2 | 58.4 | 56 | 52 | 50 | +2.4 | +6.4 | +8.4 |
| R3 | 59.8 | 55 | 53 | 50 | +4.8 | +6.8 | +9.8 |
| R4 | 62.9 | 58 | 56 | 52 | +4.9 | +6.9 | +10.9 |
| R5 | 65.0 | 57 | 55 | 53 | +8 | +10 | +12 |

| Table 5.2-11<br>Comparison of Measured Nighttime Background Noise Levels to Predicted KRCDPP Noise Levels With Silencer Packages on the Exhaust Stacks<br>KRCDPP | | | | | | | |
|---|---|---|---|---|---|---|---|
| Receiver Location | Predicted KRCDPP Noise Levels, dBA | Measured Background Noise Levels, dBA | | | Predicted Increase in Background Noise Levels, dBA | | |
| | | Leq | L50 | L90 | Leq | L50 | L90 |
| R1 | 51.2 | 57 | 56 | 53 | +1 | +1 | +1 |
| R2 | 36.4 | 56 | 52 | 50 | 0 | 0 | 0 |
| R3 | 43.4 | 55 | 53 | 50 | 0 | 0 | +1 |
| R4 | 34.9 | 58 | 56 | 52 | 0 | 0 | 0 |
| R5 | 47.4 | 57 | 55 | 53 | 0 | 0 | +1 |

Based upon the analyses contained within Tables 5.2-10 and 5.2-11, the project site will clearly exceed the 10 dB increase in nighttime hourly L90 values that the CEC employs as the test of significance without the use of silencer packages on the turbine exhaust stacks. The analysis also indicates that the project site will not exceed the 10 dB increase in nighttime hourly L90 values that the CEC employs as the test of significance while including the use of silencer packages on the turbine exhaust stacks. Therefore, as a part of the project design, this analysis will include the silencer packages on the turbine exhaust stacks.

Based upon the KRCDPP including the use of silencer packages on the turbine exhaust stacks, the KRCDPP will exceed the City of Fresno and County of Fresno nighttime exterior noise level criteria of 45 dB Leq and 45 dB L50, respectively. It is important to note that City of Fresno and County of Fresno nighttime exterior noise levels are already exceeded, without considering the KRCDPP, as shown above in Tables 5.2-4, 5.2-5 and 5.2-6.

The City of Fresno standards do allow for a +5 dB increase in project noise levels over ambient noise levels. The inclusion of silencer packages on the turbine exhaust stacks will result in an increase in noise levels between 0 and 1 dB Leq. The KRCDPP will therefore comply with the City of Fresno exterior noise level criteria.

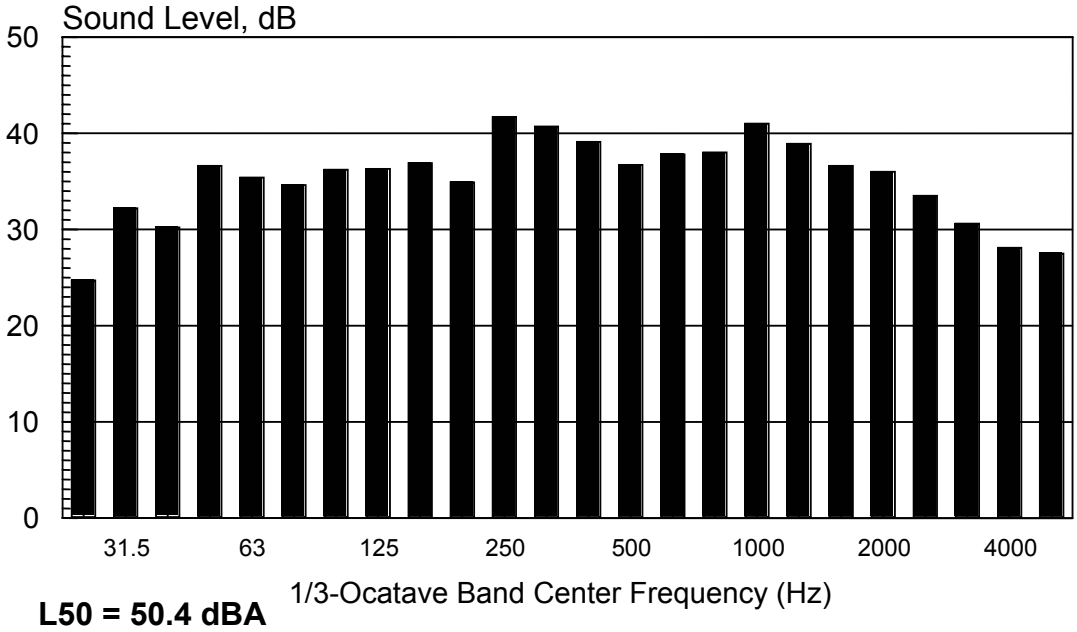
Fresno County standards do not provide for an increase in background noise levels due to a project. However, the projected noise levels at the nearest noise-sensitive uses do not result in a significant impact under CEQA, regardless of the noise metric.

As a means of visually showing the potential noise impacts associated with the proposed project, the ENM was used to produce a noise contour map of noise impacts associated with the KRCDPP. This analysis assumes that silencer packages on the turbine exhaust stacks. Figure 5.2-2 shows the ENM contour noise analysis for the project site.

**Tonal Noise**

Tonal noise due to industrial operations can be annoying, and many jurisdictions employ penalties to noise sources which have discreet tonal components. Bollard & Brennan, Inc. conducted 1/3 octave band noise level measurements of a gas-fired power plant in Klamath Falls, in 2001. Noise measurements were conducted using a Larson Davis Model 2900 precision integrating sound level meter, which was equipped with 1/3 octave band filters. The results of the analysis indicate that the noise levels are fairly broadband, and absent of discreet tonal noise. Therefore, the proposed KRCDPP is not expected to result in tonal noise impacts at the nearest residences. Figure 5.2-3 shows the results of the 1/3 octave band noise level measurements.

**Figure 5.2-3**
**Oregon Power Plant 1/3-Octave Band Center Frequency Analysis**
**At 800 Feet**




**Ground and Airborne Vibration**

Ground and airborne vibration levels associated with KRCDPP operations are not anticipated to affect the surrounding areas. The proposed KRCDPP's potential airborne vibration impacts would be due to the turbulent flow of air driven by the gas turbines. However, these systems are equipped vibration monitoring systems, which determine significant imbalances of equipment. In the event of a significant imbalance in the equipment, corrective measures are employed to reduce those effects.

### 5.2.7 Proposed Mitigation Measures

The project design and implementation includes combustion turbine air inlet silencers; combustion turbine acoustical enclosure; and combustion turbine exhaust stack silencers. No additional mitigation is proposed.

### 5.2.8 References

Baker, 2003. Phone Conversation between Steve Baker, California Energy Commission and Jim Brennan, Bollard and Brennan, Inc. September 16, 2003.

Bollard & Brennan, Inc., 2001. Klamath Generation Facility Environmental Noise Analysis.

City of Fresno, 2002. 2025 Fresno General Plan Noise Element and related Draft Environmental Impact Report No. 10130. Planning and Development Department Advance Planning, February 1, 2002.

County of Fresno, 2000. Fresno County General Plan Policy Document. General Plan Update. October 3, 2000.

Cunniff, 1977. Environmental Noise Pollution by Patrick R. Cunniff.

Egan, 1988. Architectural Acoustics by M. David Egan.

Navigant Consulting, September 2003. Faxed Communications from BAC Cooling Tower Sound Data Inputs.

Navigant Consulting, September 2003. Faxed Communications from Sound Technologies Inc. Gas Turbine noise level data.

Navigant Consulting, October 2003. Email communications from Aero Energy Products Turbine Package and Exhaust Stack noise level data.

RTA Technology Pty. Ltd., ENM Windows, Sydney Australia.

S:\Design Engineering\Projects\116289\40620\FIGURE 5.2-1.dwg, 11/07/2003 11:48:10 AM

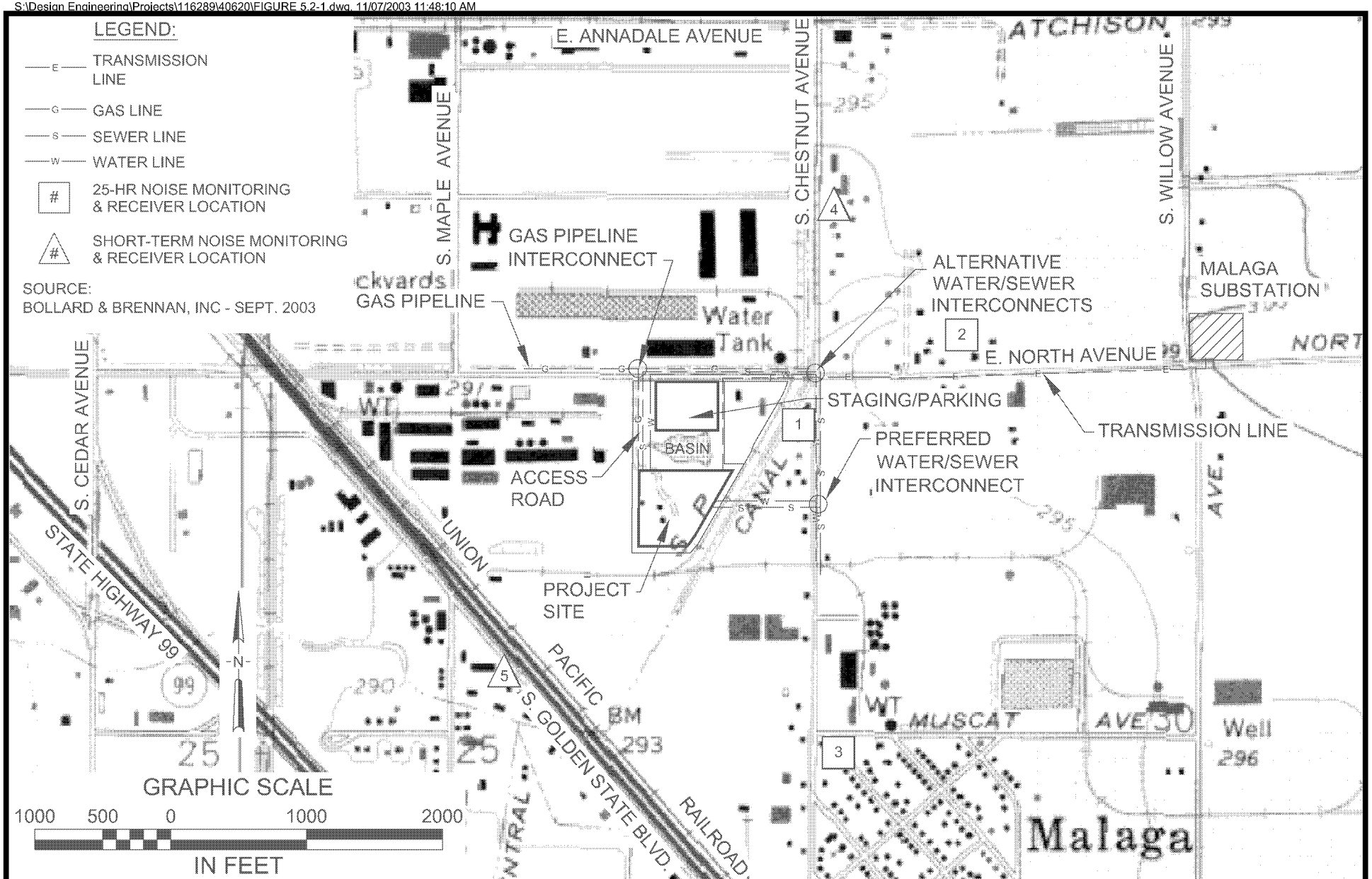



FIGURE 5.2-1

Noise Measurement and Receiver Loactions

KRCDPP

KRCD
Kings River Conservation District

09/30/03 REV. 0

S:\Design Engineering\Projects\116289\40620\FIGURE 5.2-2.dwg, 11/07/2003 11:54:03 AM

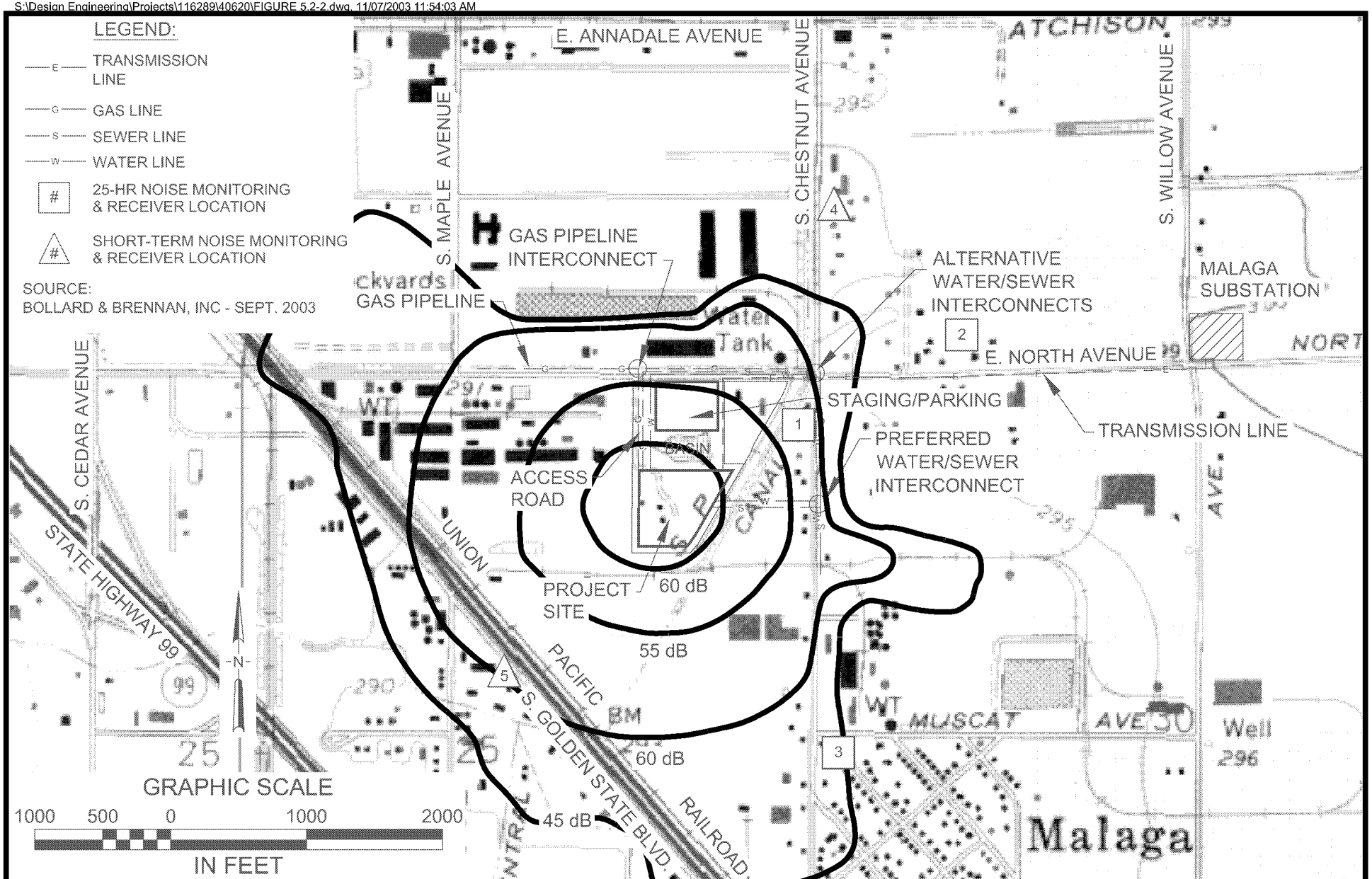



FIGURE 5.2-2

Noise Contours With Stack Silencing Packages

KRCDPP

KRCD
Kings River Conservation District

09/30/03 REV. 0

# SECTION 5.3 WATER RESOURCES

## 5.3.1 Introduction

This section evaluates the effect of the proposed Kings River Conservation District Peaking Plant (KRCDPP) on water resources. Water resource impacts that were investigated in this analysis include: effects on surface waters, effects on groundwater discharge, degradation and depletion, and impacts of storm water and potential for flooding. Kings River Conservation District (KRCD) is developing the proposed KRCDPP. KRCD is a political subdivision of the State of California and was formed by the California Legislature with the passage of the "Kings River Conservation District Act" in 1951. KRCD service area covers approximately 1,240,000 acres of land in the central San Joaquin Valley. KRCD boundaries include portions of Fresno, Kings, and Tulare Counties. KRCD boundaries encompass the entire service area of the Kings River, which is the primary source of water for the area. The flow of water in the Kings River is variable from year to year. During "normal" (average annual "natural" flow at Pine Flat Dam[1] and assuming no interference by storage) and "dry" (when runoff is less than normal) years, the available surface water supply does not meet the total water demand of the area. When such a shortage of water exists, the deficiency is remedied by the pumping of the groundwater. This usually results in a drop in the water table. During the years when runoff exceeds normal, the water table may rise due to a decrease in pumping and natural recharge.

An integral part of KRCD's mission and vision is to provide flood protection, achieve a balanced and high quality water supply, and develop power resources on the Kings River for the public good. KRCD expends large amounts of resources to study groundwater and water quality in the area. Initiated in 1987, KRCD has written an Annual Groundwater Report most every year. This report is used by 28 Irrigation Districts, 14 Cities, and other interested parties that lie within KRCD boundaries. The most recent version of this report is included as Appendix 5.3-1.

## 5.3.2 Affected Environment

The proposed KRCDPP will consist of an approximately 97 megawatt (MW) natural gas-fired peaking power plant to be located near the Community of Malaga, in Fresno County, California. The proposed project site is located south of North Avenue, west of

[1] The Pine Flat Dam is the dividing point between Lower and Upper Kings River and approximately 25 miles east of Fresno. The Army Corps of Engineers completed it in 1954 for the primary purpose of flood control, however it is also has irrigation, power and recreational benefits. KRCD owns and operates the Pine Flat Power Plant, located at the base of the dam. The plant harnesses the power of the river by using irrigation and flood releases from Pine Flat Reservoir to generate electricity.

Chestnut Avenue, and is situated on the west side of the Central Canal, which is owned and operated by the Fresno Irrigation District (FID). The Kings River Conservation District (KRCD) currently has an option to purchase approximately 19 acres of land and the KRCDPP site would consist of the southern 9.5 acres of the property. The northern 9.5 acres would be used for temporary construction staging and parking areas. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. As described below, the linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site. The KRCDPP and its associated linear facilities are shown on Figure 1.2-3, in Chapter 1, Executive Summary.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new, taller transmission poles, which would carry the new 115kV line above the 12kV line. Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. Water supply, sewer and wastewater interconnections are discussed in further detail in the following sections.

#### *5.3.2.1 Regional Water Resources/Hydrologic Setting*

The climate in the project area usually consists of hot arid summers with mild winters. Daytime temperatures during the summer months typically range between 80 degrees Fahrenheit (°F) and 100°F, with peak days up to 118°F. The rainy season generally extends from November through March. Rain events will infrequently occur during other periods. Average annual precipitation is between 11 and 12 inches.

The proposed KRCDPP project site is located in the Tulare Lake Basin along the eastern edge of the Central Valley bordering the Sierra Nevada Mountain range. The San

Joaquin and Kings Rivers are the two largest sources of surface water in the area. These rivers begin high in the Sierras to the east. These waters are stored in several large reservoirs in Madera and Fresno counties for the purpose of sustaining beneficially used water for the hot dry summer months. These rivers are diverted in several locations by canals and sloughs that deliver irrigation and reclamation water throughout the upper Tulare Lake Basin.

### *5.3.2.2 Climate/Precipitation*

The Fresno-Yosemite International Airport is located approximately 5 miles from the proposed KRCDPP project site and has an active weather station that has been in operation since December 1, 1941. This is the closest active weather station to the proposed KRCDPP. It is set at an elevation of 333 mean sea level (msl). The weather station's elevation is approximately 30 feet higher than the foundation of the proposed KRCDPP. The following table, Table 5.3-1, provides precipitation and temperature data based upon monthly averages for the periods of 1971 to 2000.

**Table 5.3-1**
**Summary of Temperature (in °F) and Precipitation (in inches)**
**KRCDPP**

| | | **Month** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Summary** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** |
| Average Maximum | 75.3 | 78.1 | 63.0 | 53.4 | 53.6 | 61.3 | 66.1 | 74.0 | 82.7 | 90.9 | 96.6 | 94.8 | 88.8 |
| Average Minimum | 51.9 | 51.9 | 42.3 | 37.0 | 38.4 | 41.4 | 44.9 | 48.4 | 54.9 | 61.2 | 66.1 | 64.9 | 60.4 |
| Monthly Precipitation | 11.23 | .65 | 1.10 | 1.34 | 2.16 | 2.12 | 2.20 | .76 | .39 | .23 | .01 | .01 | .26 |

Source: Online Highways, Fresno Yosemite Airport, 2003.

### *5.3.2.3 Proposed KRCDPP Water Supply and Use*

The proposed KRCDPP will use water supplied by the Malaga County Water District (MCWD), which currently serves the local area near the project site and has an existing 10-inch supply line located along Chestnut Avenue. MCWD has a single distribution system that delivers water for both potable and non-potable uses in the area. The source of supply is entirely from groundwater. Water from the MCWD would serve the domestic, cooling, and process water demands of the proposed KRCDPP. The peak water demand for the KRCDPP is estimated at 210 gallons per minute (gpm).

Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a pipeline running east

from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues. The MCWD may require the secondary alternative to maintain consistency with MCWD policy requiring water and sewer main construction across the entire frontage of a proposed development.

MCWD has confirmed that sufficient water supply and sewer services are available and can be provided for the proposed KRCDPP. A copy of the "will serve" letter from MCWD is included in Appendix 5.3-2. The proposed KRCDPP site is presently located within the Sphere of Influence of the MCWD, however, it is outside the existing MCWD boundary. The property would be required to annex to the MCWD to receive water and sewer service. KRCD and MCWD would enter into an "Out-of-District" Service Agreement to provide services while the annexation process is being completed. Annexation of the site would not be a pre-requisite to obtaining water and sewer services.

The analysis of the alternative water supplies that were considered is included in Chapter 6, Alternatives.

The 210 gpm peak inflow coming into the KRCDPP will need to be treated prior to its use for power plant cooling. The potable water supplied by MCWD will be demineralized using either a permanent or temporary (leased) water treatment system on site, and then used for the control of Oxides of Nitrogen (NOx) and for Sprint power augmentation and air chiller cooling tower needs, as described further in Chapter 2, Project and Facility Description.

#### *5.3.2.4 Flooding*

The Federal Emergency Management Agency (FEMA) has mapped the project area as being located outside the 100-year flood hazard zone (ESA, 2003). Only two narrow areas along the Central Canal and west of State Route 99 are considered susceptible to a 100-year flood event. These areas are within the project vicinity, but are not adjacent to the proposed KRCDPP. The remainder of the project vicinity is protected through existing drainage pipelines and ponding basins.

The Fresno Metropolitan Flood Control District (FMFCD) is the agency responsible for storm water management at the KRCDPP. An existing storm water basin is located just north of the project site and the KRCDPP will use the basin as a storm water retention pond for use during project construction, as discussed further in the KRCDPP draft

Construction Storm Water Pollution Prevention Plan (SWPPP), which is included as Appendix 5.3-3. Based on communications with FMFCD, using the basin just north of the project site is allowed, provided it is capable of supporting a 100-year rain event (Hoffman, 2003). The basin has a capacity of 22 acre-feet. A 100-year event on the 19-acre parcel would be approximately 9 acre feet of water; therefore, the basin would support a 100 year rain event.

#### *5.3.2.5 Wastewater*

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal, as described further in Section 5.10, Hazardous Materials and Waste Management. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed.

The ZLD will result in less potential for impacts than with the discharge of power plant cooling water to either land or other surface waters. The ZLD system also has the advantage of making the maximum use of water supplies. The ZLD system is discussed further in Chapter 2, Project and Facility Description.

The KRCDPP will interconnect to the existing MCWD sewer system for the discharge of domestic wastes. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described above.

#### *5.3.2.6 Groundwater*

Regional groundwater conditions vary from eastern to western Fresno County. Groundwater in the area is generally deep and alkaline. Aquifers east of the valley trough are semi-confined to unconfined. Water quality is good, with exceptions of some localized areas. Groundwater overdraft occurs near the major cities of Fresno and Clovis. Extensive groundwater use by irrigation districts (including Raisin City Water District and Mid-Valley Water District) and individual property owners also substantially adds to the existing overdraft problem in the Central Valley. Several large depressions exist within Fresno County, mainly near Raisin City and under the City of Fresno. These are caused by large amount of groundwater overdraft in those areas of the Central Valley. The California Department of Water Resources (CDWR) has estimated groundwater overdraft of 650,000-acre feet for 1990 in the Tulare Lake Region. Overdraft varies year to year, depending on surface water availability for much of Fresno County. Long-term

projections indicate a continuing annual overdraft of the basin underlying most of Fresno County (Fresno County, 2000).

MCWD gets its entire water supply from groundwater. Unlike the City of Fresno, which uses 60,000 acre-feet of surface waters from the San Joaquin and Kings Rivers as well as groundwater supplies to meet its supply needs. All customers, whether residential, commercial or industrial within the MCWD service territory and/or served by MCWD get their supply from the MCWD system, which is supplied by groundwater. MCWD currently has three active groundwater wells with one new well due online by the year-end of 2003. The current wells have a total water capacity of approximately 3500 gpm. The new well will have a capacity of approximately 1500 gpm, bringing the MCWD water supplies to approximately 5000 gpm. There is adequate water supply available from MCWD to meet the peak water demand required for KRCDPP operations.

The majority of the project area is industrial and several sources of groundwater contamination have also been discovered and catalogued. Groundwater contaminants of regional concern include a full range of industrial and agricultural chemicals, including volatile organic compounds, petroleum hydrocarbons, chlorinated solvents, pesticides, metals, gross alpha and beta radiation, and other industrial compounds. In particular, the now banned agricultural pesticide, dibromochloropropane (DBCP) and ethylene dibromide (EBD) are considered widespread contaminants that were previously utilized to control nematodes and fumigate citrus crops (ESA, 2003).

Groundwater below the site as reported in the KRCD Annual Groundwater Report 2000 is approximately 50 feet below ground surface and flows in a northwesterly direction (KRCD, 2001). For further information regarding depth to groundwater in the project area, see Figure 14 in the 2000 Annual Groundwater Report that is included as Appendix 5.3-1. Local groundwater levels fluctuate to a small degree annually depending upon precipitation, runoff, and groundwater pumping.

#### *5.3.2.7 Surface Water*

The project area is located on an elevated alluvial plain situated between the San Joaquin River and Kings River systems. The San Joaquin River is located approximately 18 miles north of the KRCDPP, while the closest section of the Kings River is located about 15 miles south of the KRCDPP. There are no significant natural water features on or adjacent to the project area. There are abundant man-made canals that deliver irrigation water originating from the Kings River and capture irrigation tail water. Canals crisscross the fields, parallel the roads, and cross the locations of the proposed linear facilities (i.e. transmission, gas, sewer and water). Within a 2-mile radius of the proposed

KRCDPP there are no natural surface waters, however, there are several canals and drainage ponds in the area. The only major surface waters in the project vicinity are the Central Canal and one of its diversions, the Fresno Colony Canal, which are owned and operated by Fresno Irrigation District (FID).

The Central Canal is a narrow, 30 foot by 5 foot canal operated and maintained by FID. This surface water has been diverted from the Kings River through Fresno Main Canal to be used for beneficial agricultural uses. Water is usually only found in this canal during high periods of storm water runoff, or during irrigation seasons. During irrigation seasons, the canal typically carries a capacity of 13,420 acre-feet per month during July. Some places along the canal are concrete lined with some areas showing bare compacted soil bottom. The canal walls and subsequent levee are generally barren with the exception of a few cottonwood trees and native vegetation that isn't controlled by FID's vegetation abatement program.

### *5.3.2.8 Water Quality*

To determine the quality of the MCWD water, a groundwater sample from groundwater well number 4 was taken on September 17, 2003 and analyzed for the constituents identified below in Table 5.3-2. The raw groundwater from the MCWD Well Number 4 is considered nonpotable and is passed through a granulated activated carbon (GAC) filter and then chlorinated to meet applicable potable and drinking water standards. The water analyzed was potable water that was sampled after the filter. The results of the analysis are also included in Table 5.3-2.

**Table 5.3-2**
**Water Quality Data – MCWD Groundwater Well Number 4 After Filtration**
**KRCDPP**

| Constituent | Measured | Constituent | Measured |
|---|---|---|---|
| Alkalinity (as CaCO3) | 200 mg/L | Langelier Index | 1.0 |
| Aluminum | ND mg/L | Magnesium | 26 mg/L |
| Ammonia | ND mg/L | Manganese | ND mg/L |
| Antimony | ND µg/l | Mercury | ND µg/l |
| Arsenic | ND µg/l | Molybdenum | ND µg/l |
| Barium | 0.070 mg/l | Nickel | ND µg/l |
| Beryllium | ND µg/l | Nitrate (NO3) | 32 mg/L |
| Bicarbonate | 200 mg/L | Nitrite (NO2-N) | ND mg/L |
| Boron | ND mg/L | pH | 8.2 |
| Bromide | 0.083 mg/L | Phosphorous | ND mg/L |
| Cadmium | NDµg/l | Potassium | 4.0 mg/L |
| Calcium | 55 mg/L | Selenium | ND µg/l |

| Table 5.3-2<br>Water Quality Data – MCWD Groundwater Well Number 4 After Filtration<br>KRCDPP | | | |
|---|---|---|---|
| **Constituent** | **Measured** | **Constituent** | **Measured** |
| Chloride | 27 mg/L | Silica | 39 mg/L |
| Total Chromium | 16µg/l | Silver | ND µg/l |
| Copper | ND µg/l | Sodium | 31 mg/L |
| Cyanide | ND µg/l | Strontium | 300 µg/l |
| Electrical Conductivity | 530 µmho/cm | Sulfate (SO4) | 17 mg/L |
| Fluoride | ND mg/L | Sulfur | |
| Hardness – Total (as CaCO3) | 240 mg/L | Thallium | ND µg/l |
| Iron | ND mg/L | Total Dissolved Solids | 350 mg/L |
| Lead | ND µg/l | Turbidity | 0.20 NTU |
| Lithium | ND mg/L | Zinc | ND mg/L |
| Carbonate | ND mg/L | | |
| Hydroxide | ND mg/L | | |

**Acronyms:**
mg/L – Milligrams per liter
ND –Non Detect
µg/l – microgram per liter
µmho/cm – micromhos per centimeter
NTU – Nephelometric Turbidity Unit

**Source:** BSK, 2003.

### 5.3.3 Laws, Ordinances, Regulations, and Standards

Federal, state, county and local LORS applicable to water resources and conformance are discussed below:

#### *5.3.3.1 Federal*

**Clean Water Act**

The Clean Water Act (CWA) authorizes U.S. Environmental Protection Agency (USEPA) to regulate discharges of wastewater and storm water into surface waters by issuing National Pollutant Discharge Elimination System (NPDES) permits setting pretreatment standards. The Regional Water Quality Control Board (RWQCB) implements these permits at the state level, but USEPA may retain jurisdiction at its discretion. The CWA's primary effect on the KRCDPP is with regard to the control of soil erosion during construction and the need to prepare and implement site-specific erosion control plans and measures for the construction of each project element that will entail the physical disruption or displacement of surface soil.

### *5.3.3.2 State*

**State Water Resources Control Board and the Central Valley Regional Water Quality Control Board**

The General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (NPDES Permit No. CAS000002), also known as the General Construction Permit, is required for all construction activities that involve more than five acres of land disturbance. Modifications to the General Construction Permit, which were adopted in late 2002, expanded the NPDES program by lowering the threshold acreage of soil disturbance requiring permit coverage from five acres to one acre. The program modification became effective in March 2003. The General Construction Permit is implemented and enforced by the appropriate RWQCB. The General Construction Permit for the proposed KRCDPP will be implemented and enforced by the Central Valley Regional Water Quality Control Board (CVRWQCB), Fresno Office.

To be covered under the General Permit, a Notice of Intent (NOI) must be filed with the appropriate RWQCB and a Storm Water Pollution Prevention Plan (SWPPP) must be prepared. The SWPPP must also be kept onsite during construction and made available to the RWQCB or other appropriate local agencies upon request. A draft of the Construction SWPPP is included as Appendix 5.3-3.

SWRCB Order 97-03-DWQ authorizes general industrial storm water permits. An industrial SWPPP will be prepared prior to operation of the KRCDPP.

**Porter-Cologne Water Quality Control Act**

The Porter-Cologne Water Quality Control Act, California Water Code Section 13000 et seq., delegates the control of pollutant discharges to surface and groundwater from the SWRCB to the nine RWQCBs and identifies water quality criteria to protect state waters. This criteria includes the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The RWQCB with jurisdiction over the KRCDPP is the CVRWQCB. No action is required from the proposed KRCDPP to comply with this act.

**California Water Code Sections 13550, 13551, 461 and SWRCB Resolution No. 75-58**

These water code sections and policy statements encourage the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.

**Title 22 of the California Code of Regulations**

Title 22 addresses the use of reclaimed water; in particular, Section 60306 sets the criteria for the use of reclaimed water for cooling. Such cooling water is defined as disinfected tertiary reclaimed water in Section 60401.230.

### *5.3.3.3 Local*

**County of Fresno**

Local Fresno County ordinances focus on flood control concerns, storm water protection, and erosion control as well as use of reclaimed water for cooling. The Fresno County General Plan and FMFCD Water Resources Plan outline their respective interests in flood control and storm water protection. The FMFCD regulates storm water discharge and permitting in the area of the proposed KRCDPP. Fresno County General Plan outlines several policies, goals, and implementation measures for water resources. These objectives, which apply to KRCDPP, are outlined below.

Policy OS-A.23: The County shall protect groundwater resources from contamination and overdraft by pursuing the following effects:

- Identifying and controlling sources of potential contamination;
- Protecting important groundwater recharge areas;
- Encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses where feasible;
- Encouraging the use of treated wastewater for groundwater recharge and other purposes (e.g., irrigation, landscaping, commercial, and non domestic uses);
- Supporting consumptive use where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area;
- Considering areas where recharge potential is determined to be high for designation as open space; and
- Developing conjunctive use of surface and groundwater.

Policy OS-A.25: The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The county shall discourage grading activities during the rainy season unless adequately mitigated to avoid sedimentation of creeks and damage to riparian habitat.

Policy OS-A.27: The County shall monitor water quality regularly and take necessary measures to prevent contamination, including the prevention of hazardous materials from entering the wastewater system.

**City of Fresno**

The 2025 City of Fresno General Plan outlines several objectives for its water resources. The Fresno area needs adequate quantities of water suitable for human consumption, recreation, and agriculture. In conjunction with the FMFCD Water Resources Plan and the 2025 General Plan Regional Cooperation and Public Facilities Elements, the resource element provides policy direction toward assuring that these needs will be met in the long term. The following goals are applicable to the KRCDPP:

G-2. OBJECTIVE: Maintain a comprehensive, long-range water resource management plan that provides for appropriate management of all sources of water available to the planning area and ensures that sufficient and sustainable water supplies of good quality will be economically available to accommodate existing and planned urban development.

G-3. OBJECTIVE: Protect water resources in the area from further degradation in quality.

G-4. OBJECTIVE: Manage, use, and replenish water resources to maintain a balanced "water budget" in the Fresno area.

- Use surface water, as necessary, to balance the aquifer's long-term sustainable yield with projected demand.
- Use surface water, as necessary, to maintain the overall high quality of Fresno's underground reservoir.
- Protect, develop and maintain areas and facilities necessary for groundwater recharge, including in-lieu recharge achieved through use of a surface water treatment plant.
- Promote use of surface water for landscape irrigation when this is practical and beneficial to overall water management objectives.

### *5.3.3.4 Required Permits and Agency Contacts*

This section includes a description of the water resources related permits that are required for the proposed KRCDPP and the required time to obtain them.

| Table 5.3-3<br>Water Resources Permit Schedule<br>KRCDPP | | |
|---|---|---|
| **Permit or Approval** | **Applicability/Schedule** | **Agency Address/Phone** |
| Storm Water Permit for Construction Activities (General Construction Permit) | Required to regulate the discharge of storm water during construction.<br><br>Will be obtained prior to construction. A draft of the construction SWPPP is included as Appendix 5.3-3. | CVRWQCB<br>1685 E Street<br>Fresno, CA 93706<br>(559) 445-5116 |
| Storm Water Permit for Industrial Activity | Required to regulate surface runoff during project operations.<br><br>Will be obtained prior to KRCDPP operations. | CVRWQCB<br>1685 E Street<br>Fresno, CA 93706<br>(559) 445-5116 |
| Non-Residential Wastewater Discharge Permit | Will be obtained prior to the connection of sewer services | MCWD<br>3580 South Frank Street<br>Fresno, CA 93725<br>(559) 485-7353 |

## 5.3.4 Environmental Consequences

### *5.3.4.1 Environmental Checklist*

The following Table 5.3-4, is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the California Energy Commission (CEC) to assess the potential for significant impacts to water resources.

| Table 5.3-4<br>CEQA Environmental Checklist –Water Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| **WATER RESOURCES – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| a) Violate any water quality standards or waste discharge requirements? | | | | X |
| 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 | | | | X |

| Table 5.3-4<br>CEQA Environmental Checklist –Water Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| **WATER RESOURCES – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| 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)? | | | | |
| 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? | | | | X |
| 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 which would result in flooding on- or off-site? | | | | X |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? | | | | X |
| f) Otherwise substantially degrade water quality? | | | | X |
| 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? | | | | X |
| h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows? | | | | X |
| i) Expose people or structures-to a significant risk of loss, injury or death | | | | X |

| Table 5.3-4<br>CEQA Environmental Checklist –Water Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| **WATER RESOURCES – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| involving flooding, including flooding as a result of the failure of a levee or dam? | | | | |
| j) Inundation by seiche, tsunami, or mudflow? | | | | X |
| k) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | | | | X |
| l) 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? | | | | X |
| m) 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? | | | | X |
| n) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | | | | X |
| o) 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? | | | | X |

### 5.3.5 Impact Assessment

This section includes an analysis of the potential impacts on local water supplies. An analysis of other water supply alternatives that were considered is included in Chapter 6, Alternatives.

#### *5.3.5.1 Potential for Flooding and Storm Water Impacts*

The proposed KRCDPP is located outside of the 100-year flood hazard zone and no areas adjacent to the KRCDPP are considered susceptible to a 100-year flood event. Therefore there will be no significant impact of flooding a result of the proposed KRCDPP.

Storm water associated with construction of the proposed KRCDPP will be directed to the existing 4-acre storm water basin located just north of the project site. The measurements of the basin are 500 feet long by 250 feet wide and approximately 22 feet deep. Based on communications with FMFCD, using the basin on the project site is allowed, provided it is capable of supporting a 100-year rain event (Hoffman, 2003). The basin has a capacity of approximately 22 acre-feet of water and is sufficient to handle all storm water runoff associated with the construction of the KRCDPP as well as a 100-year flood event.

Storm water runoff will be controlled during construction and KRCDPP operations by adhering to the requirements of the General Construction Permit and General Industrial Permit that will be obtained from the CVRWQCB. The Construction SWPPP identifies specific measures and Best Management Practices (BMPs) that will be implemented to control storm water runoff. The proposed KRCDPP will not result in any significant increase in storm water runoff.

#### *5.3.5.2 Impacts Associated with Wastewater Discharges*

A ZLD system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Solid waste that could cause a significant impact to the water quality in the area will be properly disposed. The only wastewater discharge associated with the KRCDPP will be to the MCWD's existing sewer system for domestic wastes. MCWD's existing sewer system has sufficient capacity for receiving the domestic waste from the KRCDPP. The proposed KRCDPP will not result in any significant impacts to the existing sewer system.

#### *5.3.5.3 Impacts on Groundwater Supply*

The proposed KRCDPP would use potable water from the MCWD's existing water supply system to serve the domestic, cooling, and process water demands. MCWD gets

its water supply from the underlying groundwater. All customers, whether residential, commercial or industrial within the MCWD service territory and/or served by MCWD get their supply from groundwater.

KRCD separates its groundwater study into 6 divisions. The KRCDPP is within Division 3. This Division showed an annual loss of 101,000 acre-feet from Spring 1999 to Spring 2000. Without a ZLD system, using 270 gpm for 2500 hours, KRCDPP would use 125 acre-feet of water. This usage would add no more than 0.12% to the annual groundwater overdraft. The water usage will be less with the use of a ZLD system and 210 gpm for 2500 hours.

MCWD is the only suitable source for KRCDPP water in the area. The lack of consistent and available surface water in the area, due to its arid, industrialized region, eliminates water from those sources.

As described in Chapter 6, Alternatives, the use of water from the Malaga Waste Water Treatment Facility doesn't necessarily help lower the groundwater overdraft that exists in the area. The treated water from the plant is used as recharge for the area. Using the water simply eliminates the use of a pump for groundwater. However, a pump would still be required to transport water from the treatment plant up gradient to the KRCDPP project site.

#### *5.3.5.4 Impacts on Surface Water Supply*

The only surface waters in the area of the proposed KRCDPP are the FID Central Canal and one of its diversions, the Fresno Colony Canal, that transfer water used primarily for agricultural purposes. The proposed KRCDPP will have no impact on surface waters.

#### *5.3.5.5 Water Quality*

KRCD would not impact the water quality of the surrounding water. The KRCDPP will operate with a ZLD system that will evaporate the process wastewater as described in Chapter 2, Facility and Project Description. The KRCDPP will properly dispose of waste solids in accordance with all applicable LORS. The only wastewater discharge from the KRCDPP will be domestic waste, which will be discharged to MCWD's existing sewer system.

In addition, KRCDPP equipment areas such as lube oil storage areas and chemical storage areas will be provided with secondary containment to prevent contaminated storm water from exiting the site. Off-site storm drainage from adjacent properties will be prevented from entering the KRCDPP site, and vice versa. Site drainage facilities will be

designed to prevent flooding of permanent plant facilities resulting from a 100-year, 24 hour rainfall.

Oil-contaminated storm water resulting from equipment leakage, routine equipment maintenance, and oil-contaminated area wash down activities will be directed into the KRCDPP oil water separator prior to discharge into the storm water system.

The 210 gpm peak inflow coming into the KRCDPP from MCWD will be treated prior to use its use for power plant cooling. The water will be demineralized using either a permanent or temporary (leased) water treatment system on site, and then used for the control of NOx and for Sprint power augmentation and air chiller cooling tower needs.

#### *5.3.5.6 Potential for Wind or Water Erosion and Sedimentation*

The project site is fairly flat, with an average southerly slope of 1 foot per 400 feet down gradient. The draft Construction SWPPP (included as Appendix 5.3-3) identifies BMPs that will be implemented to control erosion and sedimentation and minimize the potential impacts associated with wind and water erosion and sedimentation.

Also as discussed in Section 5.6, Agriculture and Soils, the greatest potential impact associated with the KRCDPP is wind and water erosion as a result of temporary disturbance associated with construction activities. The potential for impacts is minimized by the wind/water erosion hazard classification of the soils in the area, which are rated at slight/none. Typical erosion controls include rip rap, revegetation, grading, and surfacing disturbed soils. Once operation of the KRCDPP ensues, landscaping to prevent wind and water erosion will be in place. Typical erosion measures include revegetation, wind breaks, and landscaping aggregate. The construction and operation of the proposed KRCDPP will not result in a significant potential for wind or water erosion and sedimentation.

### 5.3.6 Proposed Mitigation Measures

The proposed KRCDPP will mitigate the potential for impacts by complying with all applicable LORS and would not result in a significant impact to local water supplies. Therefore no mitigation other then compliance with all applicable LORS and permits is proposed.

### 5.3.7 Cumulative Impacts

The current County of Fresno General Plan designates the site and vicinity for Industrial purposes, which is consistent with the proposed KRCDPP. Without the KRCDPP, the site would continue to be used for Industrial purposes in accordance with its current zoning

and that Industrial facility would also need to be supplied water from the MCWD system. The KRCDPP would not contribute to any cumulative impacts to water resources.

### 5.3.8 References


Airphoto USA, 2002. Aerial Photograph flown by Airphoto USA, 2002.

BSK Analytical Laboratories, 2003. Certificate of Analysis, Certificate #1180. Sampling data September 12, 2003. Report Issue Date October 2, 2003.

County of Fresno, 2000a. *Fresno County General Plan Public Draft.* Sacramento, California. February 2000.

County of Fresno, 2000b. *Fresno County General Plan Background Report*. Fresno, California. October 2000.

County of Fresno, 2000c. Fresno County General Plan Policy Document. General Plan Update. October 3, 2000.

Environmental Science Associates (ESA), 2003. Proposed Malaga City Incorporation, Draft Program Environmental Impact Report. June 13, 2003.

Hoffman, Allen, 2003. Fresno Metropolitan Flood Control District. Personal Communication, October 2003.

Kings River Conservation District, 2001. *Annual Groundwater Report 2000*. Fresno, California. May 2001.

Online Highways, Fresno Yosemite Airport, 2003. Website at: www.caohwy.com/w/wx043257.htm.

Professional Service Industries, Inc., 2003. *Phase 1, Environmental Site Assessment*. Long Beach, California. May 6, 2003.

# SECTION 5.4 VISUAL RESOURCES

## 5.4.1 Introduction

Visual or aesthetic resources are generally defined as the natural and built features of the landscape that can be seen and contribute to the public's appreciation and enjoyment of the environment. The combination of landform, water, and vegetation patterns represent the natural landscape features that define an area's visual character. Built features such as buildings, roads and other structures are the component of visual resources that reflect human or cultural modifications to the landscape. Depending on the extent to which a project's presence would alter the perceived visual character of the environment, visual or aesthetic impacts may occur.

This section documents existing visual conditions in the project area and evaluates the potential for the proposed Kings River Conservation District Peaking Plant (KRCDPP) to cause significant changes to visual or aesthetic resources. In addition, this section includes a discussion of the proposed KRCDPP's relationship to applicable federal, state and local laws, ordinances, regulations and standards (LORS) and policies pertaining to visual quality in the project vicinity.

## 5.4.2 Affected Environment

### *5.4.2.1 Regional and Local Setting*

The KRCDPP is located in the San Joaquin Valley, which is situated in central California, and enclosed by the Sierra Mountains on the east and the Coast Range foothills on the west. With a floor comprised of alluvial terraces and flood plains, the San Joaquin Valley is actually the southern portion of the Great Central Valley. This valley extends approximately 450 miles longitudinally. Its landscape character is defined by a combination of natural and built features including vast areas of agricultural land devoted to orchards and field crops as well as a network of roadways, canals, railroad corridors and electric transmission structures which traverse the landscape. Highway 99 and Interstate 5 provide major north-south transportation links between the valley's cities and smaller communities including the cities of Fresno, Modesto, Merced, Clovis and the Community of Malaga.

The proposed KRCDPP would be located south of the City of Fresno and near the Community of Malaga within the most urbanized and central area of Fresno County. The development pattern found in this area generally consists of a mixture of urban and rural, residential, commercial, industrial and agricultural uses. The area's overall development pattern is largely oriented around a network of roads, which are oriented primarily north-

south and east-west. Diagonally-oriented corridors including Golden State Boulevard, the Union Pacific railroad and Highway 99 which run northwest-southeast interrupt the established street grid pattern. In addition the Central Canal and Union Pacific Railroad, which are located east of the KRCDPP project site, run in a northeast-southwest direction.

The project area occupies relatively flat terrain situated in an area comprised primarily of industrial and warehouse structures and vacant land. The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue. A former truck repair facility consisting of paved areas and low rise metal maintenance/storage buildings lies immediately north of the site along North Avenue. Across North Avenue, to the north is an industrial warehouse facility involved in cotton processing activity. Adjacent to the west, a 60-acre site formerly used for cottonseed processing has vacant warehouse structures and an elevated steel water tank. An industrial facility which produces tanks for agricultural uses lie east of the Central Canal. Adjoining the proposed KRCPP project site to the south is a 19-acre parcel of industrial zoned land. This land has historically been farmed. The Union Pacific rail corridor and Golden State Boulevard lie at the southern edge of the adjacent property.

#### *5.4.2.2 Project Site*

The proposed KRCDPP would be constructed, owned and operated by Kings River Conservation District (KRCD). KRCD currently has an option to purchase approximately 19 acres of land located near the intersection of North and Chestnut Avenues. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4 acre storm water basin is also located on the southern portion of the northern 9.5 acres. Photos 1 through 4 on Figures 5.4-2a and 5.4-2b present views taken at the project site. As shown in these photos, the currently vacant site occupies relatively level terrain covered in a mixture of brush, grass and pavement. Views from the site area encompass surrounding landscape features including the adjacent tree-lined canal on the east. Views of the canal are flanked by low-rise industrial/warehouse structures and more vertical water tank elements to the west and northwest (Photo 1) and large scale industrial tank facilities and low rise industrial buildings to the east-northeast (Photo 2). In views to the northeast, portions of two residences are also visible. Toward the left side of Photo 1, these houses appear beyond the canal vegetation, to the right of the low rise metal industrial building. To the south, additional vacant land, tree clusters and various industrial structures can also be seen (Photos 3 and 4).

### *5.4.2.3 Linear Facilities*

**Electric Transmission**

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

**Natural Gas Pipeline**

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. Because the natural gas pipeline will not involve construction of any above ground physical components and therefore would not be visible to the public, it is not discussed further in this visual assessment.

**Water and Wastewater**

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, the KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The

sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph. Because the water and sewer interconnections will not involve construction of any above ground physical components and therefore would not be visible to the public, they are not discussed further in this visual assessment.

#### *5.4.2.4 Project Viewshed and Potentially Affected Public Views*

For purposes of this visual assessment, the potentially affected environment is defined as the project viewshed or the general area from which the proposed KRCDPP is expected to be visible. As seen from many locations in the vicinity it is anticipated that views of the KRCDPP would be largely screened by existing structures and vegetation. However, it is expected that the KRCDPP could be at least partially visible from some locations in the immediate area including places along North and Chestnut Avenues. The primary views would be seen by motorists traveling along these public roadways. In addition, the KRCDPP would be seen from a short segment of the embankment along the Central Canal. Although unobstructed views would generally not be seen from existing residential areas, partially screened views of the KRCDPP would be available from the rear yards of a small number of residences adjoining the canal. The KRCDPP would not be visible from any public recreation areas nor would it be seen from a designated state scenic highway.

Brief descriptions of the visual character of potentially affected view corridors and vantage points are provided below. The text references a set of photographs, which document existing visual conditions found in the project viewshed. Figures 5.4-2c and 5.4-2h present these representative public views of the KRCDPP and Figure 5.4-1 indicates the location of photo viewpoints.

**Views from the Northeast (Figure 5.4-2c)**

The area situated northeast of the KRCDPP project site includes a mix of industrial/warehouse facilities and a small cluster of residences. There are 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E. Malaga Substation is located on the northeast intersection of North and Willow Avenues. Photos 5 and 7 are views of the existing residences located in this area, taken from Chestnut and North Avenues, respectively. As indicated in the photos, the residential sites typically include mature landscaping, which to a large extent provides visual screening.

Views toward the project site from the northeast are available from two public roadways, Chestnut and North Avenues. However, in this area, views of the site from North Avenue are generally screened by existing dense vegetation. The visual character experienced from these public roadways is somewhat typical of the project area overall in that low rise industrial/warehouse buildings and taller water tank structures are among the visible landscape features. Sporadic clusters of trees and ornamental landscaping also punctuate the area's flat terrain, screening views toward the more distant landscape. Wood utility poles supporting overhead power lines are found along both roadways. Photos 6 and 8, show views looking southwest toward the site from Chestnut Avenue near several of the existing residences found along the east side of the street. These photos indicate that views toward the project site from this area are generally screened by existing vegetation, low rise industrial buildings and a water tank which is situated just northwest of the Chestnut/North Avenue intersection.

**Views from the Northwest (Figure 5.4-2d)**

Several industrial facilities lie immediately northwest of the KRCDPP project site. Photos 9 through 11, taken from North Avenue, reflect the general industrial character of the landscape in this area. As shown in the photos, roadway views encompass a flat and open landscape, which is interspersed with various industrial buildings and structures. Wood utility poles and overhead power lines occupy both sides of North Avenue and the roadway does not include sidewalks. Photo 9 provides a slightly elevated perspective looking toward the project site from almost one mile away on North Avenue at the Highway 99 overcrossing. From here, views of the site are obstructed by intervening structures including an elevated portion of Golden State Boulevard. Photo 10, a view looking west from North Avenue near Maple Avenue, shows existing vacant industrial structures and the nearby elevated steel water tank in the foreground. A panoramic view looking east toward the site from a similar location along North Avenue encompasses flat open land including the project site seen against a partial backdrop of trees, which line the Central Canal. In this view, low rise industrial buildings and a water tank structure flank both sides of the site.

**Views from the Southwest (Figure 5.4-2e)**

The area situated southeast of the KRCDPP project site includes industrial and commercial uses as well as vacant land, the Union Pacific rail corridor and Golden State Boulevard. Photo 14, taken from Maple Avenue near Golden State Boulevard, reflects the industrial-commercial land use mix and visual character found in this vicinity. As shown in Photos 12, 13 and 15, views toward the site from this location encompass roadway and rail corridors in the foreground with a mix of low rise and larger industrial

buildings, utility poles and water tanks seen at mid range and in the distance. The tree-lined canal, visible in the distance, appears toward the right side of Photo 15.

**Views from the East (Figure 5.4-2f)**

To the east, the Central Canal and the Union Pacific rail corridor border the site. Five residences and an industrial plant lie east of the canal. Photos 16 through 18 show representative views from this area, taken from the canal embankment near the rear yard of one of the residences. Photo 16, a panoramic view looking west toward the project site, encompasses the rail corridor and open land with a low rise, metal industrial building in the foreground. Toward the center and right side of the photo additional industrial structures can be seen in the distance. Photo 17 shows a filtered view of one of the residences, seen through a break in the vegetation. As shown in Photo 18, dense vegetation, which screens west-facing views from most of the adjacent residences, borders the canal.

**Views from the Southeast at Malaga (Figure 5.4-2g)**

The Community of Malaga, situated about a half mile southeast of the project site, includes approximately 1,500 residents as well as commercial and industrial enterprises (EPS, 2003). Photos 19 through 22 are views taken from the Malaga community. Photos 19 and 21 are two views from Chestnut Avenue at the Malaga community looking northwest toward the project site. As demonstrated by these photos, views of the site are screened by intervening structures and vegetation. The upper portion of the water tank structure located northeast of the site along Chestnut Avenue can be seen on the left side of the roadway, near the center of the view. The existing residences in Malaga are generally located east of Chestnut Avenue. As shown in Photos 20 and 22, views toward Chestnut Avenue and the project site from this residential area are typically screened by mature vegetation seen in the foreground.

**Views of the Electric Transmission Line and Substation from North Avenue (Figure 5.4-2h)**

Figure 5.4-2h presents photos showing views of the electric transmission line and Malaga Substation taken along North Avenue. In this area the roadway does not include sidewalks. Low rise warehouse development occurs on the south side and mix of crop land and rural residences are found on the north side of the roadway. As indicated in the photos, wood utility poles and overhead conductors currently line both sides of North Avenue.

### 5.4.3 Laws, Ordinances, Regulations, and Standards

The KRCDPP and its associated linear and offsite facilities are located within the County of Fresno. This section includes a discussion of the federal, state and local LORS that are pertinent to visual quality at the KRCDPP site.

#### *5.4.3.1 Federal*

There have been no federal LORS or visual policies identified as applicable to the proposed KRCDPP.

#### *5.4.3.2 State*

**State Scenic Highway Program**

The State Scenic Highways program, a provision of the Streets and Highways code, was established to preserve and enhance the natural beauty of California (Caltrans, 1999). No eligible or designated state scenic highways are located within the KRCDPP viewshed.

#### *5.4.3.3 Local*

Local planning policies and documents that could be applicable to visual quality are discussed below.

**Fresno County General Plan**

The Fresno County General Plan's Open Space and Conservation Element, adopted in October 2000, addresses visual quality in terms of scenic resources and roadways. As background, the Plan recognizes the County's diverse landscape scenery which ranges from valley grassland to high mountains in terms of both its value both to the general quality of life in the county and the region's economic vitality including an expanding tourism industry. A network of Designated Scenic Roadways, identified in the Open Space and Conservation Element, has been established as part of a program to manage the county's scenic resources. Section K and L of the General Plan's Open Space and Conservation Element contain policies designed to protect the scenic resources of the county, including resources seen from roadways, and to ensure that new development enhances these resources.

**Table 5.4-1**
**Applicable County General Plan Policies Pertinent to Visual Quality**
**KRCDPP**

| Fresno County General Plan Open Space and Conservation Element | Project Conformance |
|---|---|
| Goal OS-K To conserve, protect and maintain the scenic quality of Fresno County and discourage development that | The KRCDPP is consistent and compatible with the existing visual |

| Table 5.4-1<br>Applicable County General Plan Policies Pertinent to Visual Quality<br>KRCDPP | |
|---|---|
| **Fresno County General Plan Open Space and Conservation Element** | **Project Conformance** |
| degrades areas of scenic quality. | character found in the vicinity and would not degrade visual quality. |
| Policy OS-K.1 The County shall encourage the preservation of outstanding scenic views, panoramas and vistas wherever possible. | The KRCDPP conforms because it does not affect any outstanding scenic views. |
| Goal OS-L.1 To conserve, protect and maintain the scenic quality of land and landscape adjacent to scenic roads in Fresno County. | The KRCDPP conforms because it does not affect views from a County scenic roadway. |
| Policy OS-1.1 The County designates a system of scenic roadways that includes landscaped drives, scenic drives and scenic highways. | The KRCDPP conforms because it does not affect views from any County scenic roadways. |

**Fresno County Zoning Ordinance (July 5, 1994)**

Several of the Fresno County Zoning Ordinances are applicable to the KRCDPP, including:

- Section 845.5 Property Development Standards (M-3)
- Section 843.5 Property Development Standards (M-1)
- Section 875 Electric Utilities And Services

Of those, the code sections listed in Table 5.4-2 have been determined to be applicable to the visual resources analysis of the proposed KRCDPP.

| Table 5.4-2<br>Applicable Fresno County Zoning Provisions Pertinent to Visual Quality<br>KRCDPP | |
|---|---|
| **Provision** | **Project Conformance** |
| Section 845.5: Property Development Standards (M-3):<br>The following property development standards and those in Section 855 shall apply to all land and structures in the "M-3" District.<br><br>The property development standards of the "M-l" District, Section 843.5, shall apply with the following exception: Building Height, None, except for advertising structures as provided in Section 843.5-D<br><br>Section 843.5: (H) Property Development Standards: Fences, Hedges And | The KRCDPP conforms because there are no building height restrictions. |

| Table 5.4-2<br>Applicable Fresno County Zoning Provisions Pertinent to Visual Quality<br>KRCDPP | |
|---|---|
| **Provision** | **Project Conformance** |
| Walls:<br><br>This section is intended to provide for the regulation of the height and location of fences, hedges and walls for the purpose of providing for light, air and privacy, and safeguarding the public welfare by preventing visual obstructions at street and highway intersections.<br>1. Required Fences and Walls<br>A six (6) foot high solid masonry wall shall be erected along the property line of an M-1 lot which is a district boundary between the M-1 District and any residential district.<br>a. Where the district boundary is an interior side lot line, the required wall shall be reduced in height to three (3) feet within the front yard setback area. | The KRCDPP conforms because it is not adjacent to a residential district. |
| 2. Permitted Fences, Hedges and Walls<br>No requirements except:<br>a. Fences, hedges and walls shall not exceed six (6) feet in height in any required interior side or rear yard.<br>b. Fences, hedges and walls shall not exceed three (3) feet in height in any required street front, side or rear yard. | The KRCDPP security fence will conform to fencing requirements. |
| 3. Corner Cutoff Areas<br>The following regulations shall apply to all intersections of streets, alleys, or private driveways in order to provide adequate visibility for vehicular traffic. There shall be no visual obstruction within the cut-off areas established herein.<br>a. There shall be a corner cut-off area at all intersecting streets or highways. The cut-off line shall be in a horizontal plane, making an angle of forty-five (45) degrees, with the side, front, or rear property line, as the case may be. It shall pass through the points located on both the side and front (or rear) property lines at a distance of thirty (30) feet from the intersection of such lines at the corner of a street or highway.<br>b. There shall be a corner cut-off area on each side of any private driveway intersecting a street or alley. The cut-off line shall be in a horizontal plane, making an angle of forty-five (45) degrees with the side, front, or rear property line, as the case may be. They shall pass through a point not less than ten (10) feet from the edges of the driveway where it intersects the street or alley right-of-way.<br>d. Where due to an irregular lot shape, a line at a forty-five (45) degree angle does not provide for intersection visibility, said corner cut-off shall be defined by a line drawn from a point on the front (or rear) property line that is not less than thirty (30) feet from the intersection of the side and front (or rear) property lines. | The access road from North Avenue to the project site will comply with these requirements. |

| Table 5.4-2<br>Applicable Fresno County Zoning Provisions Pertinent to Visual Quality<br>KRCDPP | |
|---|---|
| **Provision** | **Project Conformance** |
| Section 875 Electric Utilities And Services<br>1. The following plans and information shall be submitted to the Director for review in accordance with the procedures specified in Section 875-E through G, below:<br>h. Appropriate drawings of the proposed substation or switching station, showing all of the elements of the facility. Drawings should include a site plan, landscaping plans, sketches and elevations and/or sections as needed, and at the appropriate scale, to provide a thorough understanding of the spatial arrangement of the proposed facility. | KRCD will submit required plans to the county for review and comment. |
| Section 875(E) Electric Utilities And Services: Action By The Director<br>1. The Director shall review the proposed electric transmission facility or electric utility facility for compatibility with all adopted plans, existing zoning and land use. The Director may, when in the public interest, recommend such modifications as deemed necessary to protect the health, safety and welfare.<br>2. The Director shall prepare a report of all findings, including support for recommended modifications. Support for recommended modifications, based upon the premise that the location should provide the greatest public good and least private injury, shall give consideration to the following factors:<br>a. Community values.<br>b. Recreational and park areas.<br>c. Historical and aesthetic values.<br>d. Influence on the environment | Landscaping at the KRCDPP project site would include a mixture of plants and trees. As part of the site landscape concept, trees would be installed along portions of the northern and eastern boundaries and along the access road from North Avenue to the project site, to provide screening from public views. The placement of trees would allow for required clearances with overhead transmission lines and KRCDPP equipment. With the addition of landscaping, the KRCDPP responds appropriately to aesthetic factors and values. |

### Roosevelt Community Plan (1992)

The Roosevelt Community Plan provided several requirements that are applicable to the KRCDPP as follows:

### Land Use And Urban Form: Industrial Uses

Of those, the sections listed in Table 5.4-3 have been determined to be applicable to the visual resources analysis of the KRCDPP.

Goal 1-13: Ensure that new industrial development is compatible with adjacent land uses and not aesthetically or environmentally detrimental.

**Policies and Measures**

1-13.2 Apply City M-1-P Zone District requirements and the following development standards to industrial development entitlement s adjacent to properties zoned or planned for residential uses (except as may be modified by the Department in accordance with Roosevelt Plan Policy 11.2).

| **Table 5.4-3<br>Applicable Roosevelt Community Plan Pertinent to Visual Quality Provision<br>KRCDPP** | |
|---|---|
| **Policy** | **Project Conformance** |
| On properties zoned for industrial manufacturing use, a landscaped setback 20 feet wide, containing deciduous and evergreen trees, shall be planted and maintained along the property line, between these properties zoned or planned for industrial manufacturing uses and any abutting properties zoned or planned for residential uses, and along the property line abutting local streets. | Not applicable because the KRCDPP does not abut property zoned or planned residential. |
| b. The following wall and berm treatment shall be required for industrial manufacturing uses:<br>1. A solid masonry wall six and one-half (6 ½) feet in height shall be erected on, or along the property line between properties zoned or planned for industrial manufacturing uses and properties zoned or planned for residential uses;<br>2. A solid masonry wall, or any combination of solid masonry wall and earth berm, that provides a continuous barrier three and one-half (3 ½) feet in height, shall be erected on or along the setback line, 15 feet from, and parallel with, the right-of-way abutting local streets;<br><br>Earth berms shall be planted with grass or ground cover and maintained by the property owner. | Not applicable because the KRCDPP does not abut property zoned or planned residential. |
| Roof mounted and detached mechanical equipment shall be screened from view and acoustically baffled to prevent the noise level of the equipment from exceeding 55 Day/Night Average Sound Level (Ldn), measured at the nearest property line. | Not applicable because the KRCDPP does not abut property zoned or planned residential. |
| Within the area of 75 feet wide and abutting property zoned or planned for residential use, exterior area lighting for industrial manufacturing buildings, parking areas, carports, garages, access drives, loading areas, and loading docks shall be shielded to prevent line of sight visibility of the light source from abutting property zoned or planned for residential use. | Not applicable because the KRCDPP does not abut property zoned or planned residential. |

**Land Use and Urban Form: Open Space, Recreation, And Conservation**

Goal 1-16: Establish a network of multi-use trails utilizing creeks, canal banks, utility power line easements, railroad rights-of-way and highway and street corridors to maximize the community's recreational and open space resources.

**Policies and Measures**

Establish an integrated effort among affected agencies to implement multi-purpose trails as identified in the Master Multi-Purpose Trails Manual and Plan.

There are currently no bicycle facilities or bikeways in the area of the proposed KRCDPP. Bikeways along Golden State Boulevard and Jensen Avenue (generally west and north of the project area) are planned but have not been implemented (Gorman, 2003). Bicyclists share the roadways with motorists throughout the area of the proposed KRCDPP.

**City of Fresno General Plan**

Provisions of the Draft 2025 Fresno General Plan for the City of Fresno that may be applicable to the KRCDPP include:

**City of Fresno Planned Land Use Map (Land Use Element, Exhibit 3)**:
Shows the KRCDPP is adjacent to Heavy Industrial Land Use in the City of Fresno.

**Section E - Public Facilities Element:**
Transportation/Trails (Exhibit 9 Mulit-Purpose Trails Plan Map): Designates North Avenue east of Chestnut and Chestnut north of North as a Bicycle/Pedestrian Trail

**E-15. Objective:**
Establish a network of pedestrian, bicycle, and where appropriate, equestrian trails to serve residential areas and to link residential areas with activity centers such as parks and recreational facilities, educational institutions, employment centers, cultural sites, and other focal points of the city environment, in order to enhance the community's recreational and alternative transportation opportunities and to provide visual and physical amenities.

**E-15-a. Policy:**
Develop multi-purpose trail corridors as shown on Exhibit 9 by employing appropriate linear rights-of-way along existing features such as riparian corridors, drainage and

irrigation easements, utility easements, abandoned railroad rights-of-way, and major street corridors.

**E-15-l. Policy:**
Establish trail routes which promote usage by providing a safe and aesthetically pleasing environment and which avoid incompatible uses wherever possible. Particular consideration shall be given to compatibility of trail alignments, which are not parallel to or readily visible from adjacent public streets.

**E-15-m. Policy:**
Utilize landscaping with appropriate and adequate physical and visual barriers (e.g., masonry walls, chain link, wrought-iron, or square-tube fencing) to screen trail rights-of-way from sensitive private property and to separate trails from dangerous sites and attractive nuisances such as irrigation canals, surface mining operations, and drainage facilities.

**E-15-u. Policy:** Aggressively pursue the attainment of trail corridors within abandoned railroad rights-of-way, canal alignments, PG&E transmission tower easements, major streets, and river bottom/bluff areas. Existing easements and rights-of-way should be offered to local agencies before being sold to private parties.

**E-16-c. Policy:** Beautify trail rights-of-way in a manner consistent with intended use, safety, and maintenance.

**E-16-d. Policy:** Appropriately utilize landscaping to stabilize slopes, create physical or visual barriers, and provide shaded areas. Where possible, preserve and incorporate native plant species into the landscaping.

### 5.4.4 Environmental Consequences

#### *5.4.4.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant impact to visual resources. This section discusses the potential for significant impacts associated with construction or O&M of the proposed KRCDPP in relation to the checklist questions in Table 5.4-4, below.

| Table 5.4-4<br>CEQA Environmental Checklist – Visual<br>KRCDPP | | | | |
|---|---|---|---|---|
| **VISUAL RESOURCES – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| a) Have a substantial adverse effect on a scenic vista? | | | | X |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | | | | X |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | | | | X |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | | | X | |

### *5.4.4.2 Impact Assessment*

The analysis of the visual effects of changes that might occur with implementation of the proposed KRCDPP is based on review of the following information: local planning documents; project maps, drawings, and technical data; aerial and ground level photographs of the project area; and computer-generated visual simulations. In addition, site reconnaissance was conducted during July 2003 in order to observe the project site and surrounding area, to take representative photographs of existing visual conditions, and to identify key public views appropriate for simulation. Consultation with the California Energy Commission (CEC) staff was conducted during the course of this study regarding the selection photographs for use in producing visual simulations of the proposed KRCDPP (Knight and Hamblin, 2003).

### *5.4.4.3 Visual Characteristics of the KRCDPP*

As indicated on the site plan layout and elevation drawing, included as Figures 2.2-2 and 2.2-3 in Chapter 2, Project and Engineering Design, the proposed KRCDPP would include two 105-foot-tall stacks and two 38-foot-tall cooling towers. On the west edge of the project site is 78-foot-tall stack would be associated with the ZLD system. In addition the facility would include a water storage tank a single story maintenance building, a loop driveway and a chain link fence, which includes vinyl slating for

screening. As shown on the site plan, the KRCDPP would be set more than 800 feet from North Avenue and would be setback about 350 feet from the eastern property line, along the Central Canal.

All proposed buildings and equipment would be metal, painted a light gray or similar color. Lighting would be provided for safety and security. All proposed lighting would utilize non-glare fixtures and would be directed on-site. Nighttime lighting for safety and security would occur at the site on a regular basis.

Landscaping at the KRCDPP project site would include a mixture of plants and trees. As part of the site landscape concept, trees would be installed along portions of the northern and eastern boundaries and along the access road from North Avenue to the project site, to provide screening from public views. The placement of trees would allow for required clearances with overhead transmission lines and KRCDPP equipment. With the addition of landscaping, the KRCDPP responds appropriately to aesthetic factors and values.

In addition, changes associated with the new transmission interconnect would occur along North Avenue between the project site and the Malaga Substation located approximately one half mile to the east. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

A discussion of visible plumes and the potential impact to traffic on local roadways is included in Section 5.7, Traffic and Transportation.

#### *5.4.4.4 Visual Simulations*

As part of this visual resources analysis, Environmental Vision produced computer-generated visual simulations to illustrate "before" and "after" visual conditions in the project area. The simulations illustrate the location, scale and conceptual appearance of the proposed KRCDPP as seen from representative viewpoints. The simulation photographs were taken in July 2003, using a single lens reflex (SLR) 35 millimeter (mm) camera. A 50mm lens, which represents a view angle of 40 degrees, was used to shoot three of these photos. The photo taken from the Central Canal embankment represents a slightly wider 54-degree view angle, shot with a 35mm lens.

The simulations, produced using computer modeling and rendering techniques, are based on project layout and engineering design data supplied by KRCD engineers. The simulation images portray proposed facility buildings and structures, but do not portray

any of the screening that would be provided by proposed landscaping at the site. Consultation with the CEC staff was conducted during the course of this study regarding the selection of photographs for use in producing visual simulations (Knight and Hamblin, 2003). The location of the simulation vantage points is depicted on Figure 5.4-1. Figures 5.4-3 through 5.4-5 present visual simulations showing the appearance of the KRCDPP project as seen from three representative vantage points:

1) Chestnut Avenue looking southwest (Figure 5.4-3),
2) North Avenue near Maple looking east (Figure 5.4-4), and
3) The Central Canal looking north (Figure 5.4-5).

In addition, a visual simulation showing the appearance of the transmission line connection as seen from North Avenue is presented as Figures 5.4-6.

***5.4.4.5 Visual Impacts***

In applying these criteria to determine significance, several factors were considered in determining the visual impacts associated with the proposed KRCDPP. These include the extent of project visibility from residential areas and other sensitive viewing locations; the degree to which the various project elements would contrast with or be integrated into the existing landscape; the extent of change in the landscape's composition and character; and the number and sensitivity of viewers. KRCDPP conformance with public policies regarding visual quality was also taken into account.

A set of visual simulations portrays the conceptual appearance of the KRCDPP from three key representative viewpoints. As indicated by the simulations and as described below, the KRCDPP would introduce a new industrial facility into a landscape setting which currently includes a variety of existing industrial structures. To varying degrees, portions of the KRCDPP would be visible to the public. Where visible, the KRCDPP would appear similar to existing industrial development seen in the general vicinity in terms of its scale and overall aesthetic appearance. Proposed landscaping at the site would partially screen views of the KRCDPP and would reduce the level of visibility. Overall, the KRCDPP would not substantially alter the character or quality of existing views currently experienced by the public in the project vicinity.

Figure 5.4-3 shows a view of the KRCDPP from about one third of a mile away on Chestnut Avenue, a vantage point located near several residences. As shown in the simulation, intervening low rise industrial structures would largely screen views of the KRCDPP from this general area. Upper portions of the KRCDPP, particularly the stacks, would be visible in the backdrop, beyond these existing buildings. In terms of its scale

and general aesthetic appearance, the visible project features would not be dissimilar to many of the existing industrial structures and facilities seen in the project vicinity. Given the level of screening provided by existing buildings, the KRCDPP would not be highly noticeable when seen from this location. Therefore, the KRCDPP would not substantially alter the character or quality of the existing landscape setting. These visual effects are considered to be less than significant.

Figure 5.4-4 shows a "before" and an "after" view of the project as seen from about one-quarter mile away on North Avenue near Maple Avenue. From here, an unobstructed view of the KRCDPP would be available. The KRCDPP would be set back from the roadway by the 9.5 acre parcel to be used for temporary staging and parking during construction and would be seen somewhat prominently with the chain link fence, the storm basin and open land in the foreground. As shown in the simulation, the proposed KRCDPP would appear within a landscape setting which includes various existing industrial structures such as the truck repair facility located immediately north and the low rise industrial buildings located to the east (as seen to the left and right of the KRCDPP, respectively). Photo 11 on Figure 5.4-2d shows a panoramic version of the Figure 5.4-4 simulation view. As shown in Photo 11, existing industrial development located along the north side of North Avenue also appears in the foreground. Additional industrial structures seen in the view include several elevated and cylindrical metal storage tanks. In terms of its scale and general aesthetic appearance, the KRCDPP would be similar to existing industrial structures seen along North Avenue. Landscaping, which includes installing trees along portions of the northern and western site boundary and along the access road, would partially screen views of the KRCDPP, thus reducing its level of visibility as seen from eastbound North Avenue. Given the brief, several-second-long duration of this view and the general consistency in scale and appearance between the proposed KRCDPP and existing nearby industrial facilities the KRCDPP would not substantially affect the existing character of views seen in the vicinity from North Avenue. In addition, proposed landscaping would provide screening that would reduce the level of visibility as seen from North Avenue. These effects are considered to be less than significant.

Figure 5.4-5 shows a "before" and an "after" view of the KRCDPP as seen from the canal embankment near the rear yard of one of the Chestnut Avenue residences. From here, an unobstructed view of the KRCDPP would be seen at a distance of about 800 feet away. As shown in the simulation the KRCDPP would replace an area of the open land with a new industrial facility. The KRCDPP would appear prominently beyond the rail line, chain link fence and open landscape seen in the foreground. Photo 16, a panoramic version of the Figure 5.4-5 simulation view, provides additional information about the

KRCDPP's industrial landscape context, which is pertinent to evaluating the visual change associated with the KRCDPP with respect to the canal embankment view. The panoramic view encompasses a low rise, metal industrial building in the foreground and several industrial structures in the distance, seen toward the center and right side of the Photo 16. To a degree, the KRCDPP would alter the landscape character seen from the canal bank. However, given the presence of several existing, industrial facilities, which are currently seen from this location, the KRCDPP would not substantially alter the character of the landscape setting in this area. In addition, landscaping would include installing trees along portions of the northern and eastern site boundaries. Landscaping along portions of the northern and eastern sides of the site would partially screen views of the KRCDPP, thus reducing its level of visibility as seen from the canal embankment (and from the small number of potentially affected residences). In light of small number of potentially affected viewers and given the screening that would be provided by KRCDPP landscaping, the effects on views from this area are considered to be less than significant.

Figure 5.4-6 presents a visual simulation showing the appearance of the proposed transmission line connection as seen from North Avenue looking east. In this view, the taller wood replacement poles would appear slightly more prominent than the existing poles currently seen on the south (right) side of the roadway. However, because their general appearance and scale would be similar to the existing structures, the replacement poles would not substantially alter the overall landscape character seen in this area along North Avenue. The KRCDPP transmission line also includes a new conductor crossing overhead on North Avenue at the Malaga Substation, which would be visible to motorists for a few seconds or less. Given the presence of existing overhead conductors crossing the roadway at this location, it would not be particularly noticeable, however. These effects are considered to be less than significant.

In summary, the KRCDPP would not result in a potentially significant impact to visual resources because:

1) It would not obstruct or substantially affect a scenic vista.
2) It does not lie within the viewshed of a designated scenic highway, and would not substantially damage scenic resources including trees, rock outcroppings, water or topographic features found within a state scenic highway.
3) It would not substantially degrade the existing visual character or quality of the site and its surroundings.

4) All new lighting would utilize non-glare fixtures and would be directed on-site, the KRCDPP would not create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

### 5.4.5 Mitigation Measures

The proposed KRCDPP would not result in any significant unavoidable adverse impacts to visual resources, therefore no mitigation measures are proposed.

### 5.4.6 Cumulative Impacts

As indicated in Land Use Section 5.5.6, there are no development plans currently under review in the project area and Fresno County currently has no plans to initiate new development or growth in the area in the near future. The scale and appearance of the proposed KRCDPP is compatible with the existing visual character and quality of the surrounding commercial and industrial area. No cumulative impacts to visual resources are anticipated for the proposed KRCDPP.

### 5.4.7 References

Airphoto USA, 2002. Aerial Photograph flown by Airphoto USA, 2002.

City of Fresno, 2002. 2025 Fresno General Plan and related Draft Environmental Impact Report No. 10130. Planning and Development Department Advance Planning, February 1, 2002.

County of Fresno, 1993. Roosevelt Community Plan Update and Draft Environmental Impact Report. SCH No. 90021238. Public Works and Development Services Department. June 1993.

County of Fresno, 1997. Fresno County Zoning Ordinances. Public Works and Development Services Department, 1960 (amended 1997).

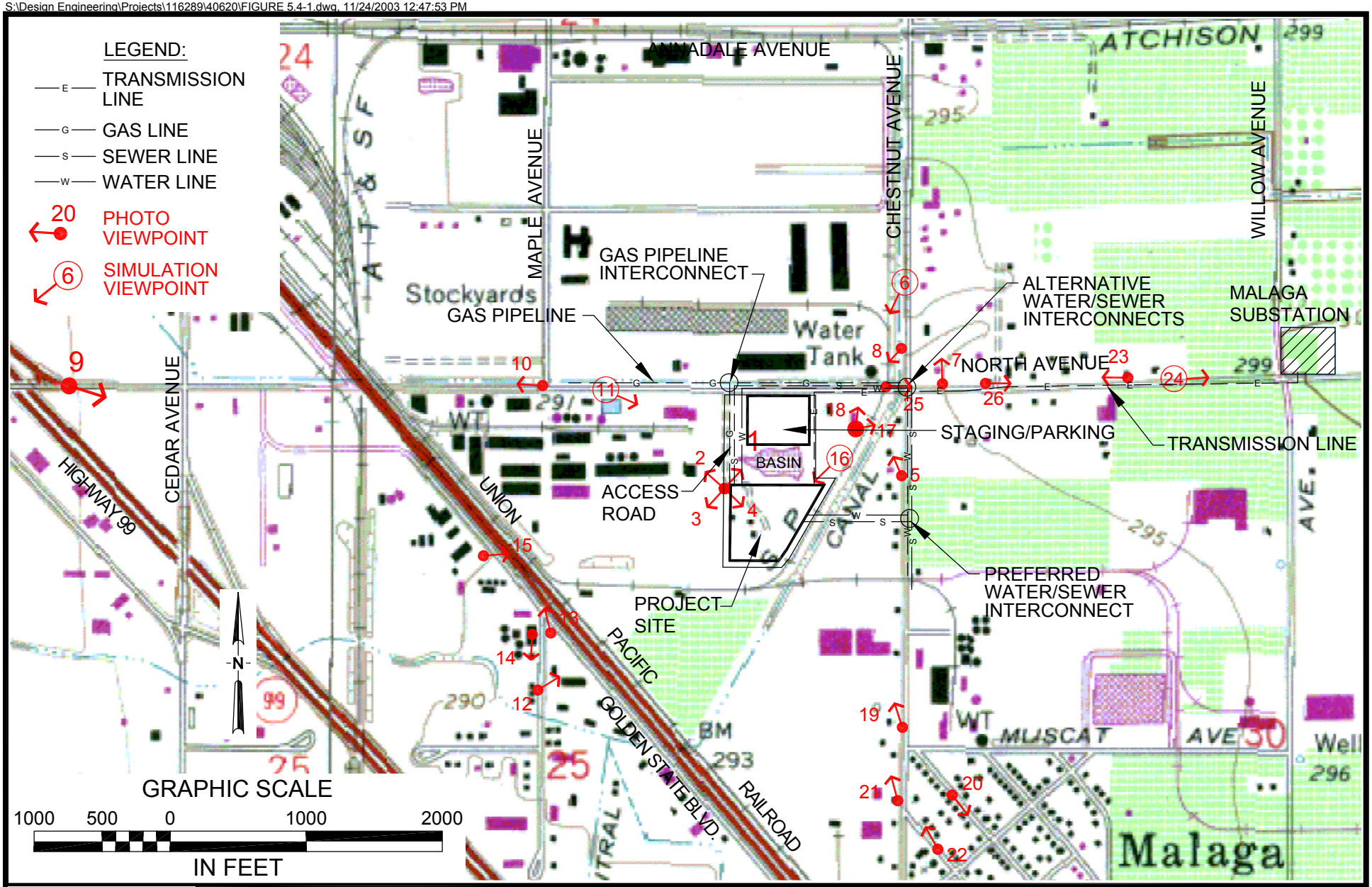
County of Fresno, 2000a. Fresno County General Plan Public Draft. Sacramento, California. February 2000.

County of Fresno, 2000b. Fresno County General Plan Policy Document. General Plan Update. October 3, 2000.

EPS Inc., 2003. Proposed Malaga Incorporation Comprehensive Fiscal Analysis 2001/2002 Update. June 2003.

Knight and Hamblin, 2003. Site Visit and Project Coordination with Eric Knight and Mark Hamblin, California Energy Commission Staff. September 2003.

S:\Design Engineering\Projects\116289\40620\FIGURE 5.4-1.dwg, 11/24/2003 12:47:53 PM




KRCD
Kings River Conservation District

FIGURE 5.4-1

Location of Photo View Points
Near the Project site

KRCDPP

09/30/03 REV. 0

1. Looking east-northeast near project site.

2. Looking west-northwest near project site.

KRCD
Kings River Conservation District

FIGURE 5.4-2a

Visual Character Photos
Views at the Project site

KRCDPP

3. Looking west-southwest near project site.

4. Looking east-southeast near project site.

KRCD
Kings River Conservation District

FIGURE 5.4-2b

Visual Character Photos
Views at the Project site

KRCDPP

5. Looking northwest from Chestnut Avenue near North Avenue.

6. Looking southwest on Chestnut Avenue*

7. Residence located northeast of North Avenue/Chestnut Avenue intersection.

*Simulation viewpoint

8. Looking southwest from Chestnut Avenue near North Avenue.

KRCD
Kings River Conservation District

# FIGURE 5.4-2c

Visual Character Photos
Views at the Project site

KRCDPP

9. Looking east from North Avenue at the Highway 99 overcrossing.

10. Looking west from North Avenue near Maple Avenue.

11. Looking east from North Avenue near Maple Avenue*.

*Simulation viewpoint

KRCD
Kings River Conservation District

# FIGURE 5.4-2d

Visual Character Photos
Views at the Project site

KRCDPP

12. Looking northeast from Maple Avenue near Golden State Boulevard.

13. Looking north from Golden State Boulevard at Maple Avenue.

14. Looking south from Maple Avenue near Golden State Boulevard.

15. Looking east from Golden State Boulevard.

KRCD
Kings River Conservation District

FIGURE 5.4-2e

Visual Character Photos
Views at the Project site

KRCDPP

16. Looking west from Central Canal at rear of Chestnut Avenue residence*.

11. Looking east from Central Canal.

*Simulation viewpoint

18. Looking north from Central Canal.

KRCD
Kings River Conservation District

# FIGURE 5.4-2f

Visual Character Photos
Views at the Project site

KRCDPP

19. Looking northwest from Chestnut Avenue near Muscat Avenue.

20. Looking southeast along South Harding Avenue.

21. Looking northwest from Chestnut Avenue at Calvin.

22. Looking northwest from Calvin.

KRCD
Kings River Conservation District

FIGURE 5.4-2g

Visual Character Photos
Views at the Project site

KRCDPP

23. Looking west from North Avenue.

24. Looking east from North Avenue toward existing substation*.

25. Looking east from North Avenue near Chestnut Avenue.

26. Looking east from North Avenue, east of Chestnut Avenue.

*Simulation viewpoint

KRCD
Kings River Conservation District

# FIGURE 5.4-2h

Visual Character Photos
Views at the Project site

KRCDPP

Existing view from Central Canal looking southwest (View 16).

Visual simulation of proposed project.

KRCD
Kings River Conservation District

FIGURE 5.4-5

Visual Simulation

KRCDPP

Existing view from North Avenue near Maple Avenue looking southwest (View 11).

Visual simulation of proposed project.

KRCD
Kings River Conservation District

# FIGURE 5.4-4

Visual Simulation

KRCDPP

Existing view from Chestnut Avenue looking southwest (View 6).

Visual simulation of proposed project.

KRCD
Kings River Conservation District

FIGURE 5.4-3

Visual Simulation

KRCDPP

Existing view from North Avenue looking east (View 24).

Visual simulation of proposed project.

KRCD
Kings River Conservation District

FIGURE 5.4-6

Visual Simulation

KRCDPP

# SECTION 5.5 LAND USE

## 5.5.1 Introduction

This section includes a discussion of existing land use and zoning designations in the vicinity of the Kings River Conservation District Peaking Plant (KRCDPP) and discusses potential land use impacts associated with the construction and operation and maintenance (O&M) of the proposed KRCDPP. The affected environment section provides a discussion of the regional setting and then includes a discussion of land uses in the project area (i.e. area within one-mile of the project site and one-quarter mile of all linear facilities associated with the KRCDPP). Other planned development and land use trends in the area of the KRCDPP are also discussed. An identification of the nearest recreational facilities and nearest sensitive receptor is also included. Discussions of conformance with applicable land use plans and policies and applicable federal, state and local laws, ordinances, regulations and standards (LORS) are also included.

## 5.5.2 Affected Environment

### *5.5.2.1 Regional Setting*

The proposed KRCDPP would be located in Fresno County in the center of the San Joaquin Valley, which stretches approximately 100 miles from the Coast Range foothills to the eastern slope of the Sierra Nevada. The project area is located in the Eastside Valley geographic area, which is located in the middle of Fresno County and includes the most urbanized area of the County. Land uses in this area generally consist of a mixture of urban and rural, residential, commercial, and agricultural uses (County of Fresno, 2000a).

### *5.5.2.2 Project Area Setting*

This section includes a discussion of existing and future land use designations and trends and current zoning both at and near the proposed KRCDPP. This section also covers the land use patterns within the project area including one mile from the proposed project site and one-quarter mile area around the associated linear facilities. Characteristic land uses surrounding the project site include; heavy industrial (M-3) manufacturing (M-1), warehouse/commercial (C-6), residential (R-1:R-2). There are also some agricultural parcels that exist in the project area which are discussed in Section 5.6, Agriculture and Soils.

Figures 5.5-1 and 5.5-2 show the land use designations and zoning information for the proposed KRCDPP project area, respectively. Figure 5.5-3 includes an identification of the jurisdictional boundaries within the project area.

### *5.5.2.3 Project Site*

The proposed KRCDPP would be constructed, owned and operated by Kings River Conservation District (KRCD). KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno near the Community of Malaga. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19-acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is also located on the southern portion of the northern 9.5 acres. An access road and rights-of-way for the gas, water and sewer and electric transmission interconnections would also cross the 9.5 acres to the north of the proposed KRCDPP site. KRCD may decide to sell the northern 9.5 acres or use it for other purposes, not associated with the KRCDPP, at a later date.

The project site is located on the southwest corner of North and Chestnut Avenues near the Community of Malaga, in Fresno County. The site address is 2611 E. North Avenue and the Assessors Parcel Number is 330-050-23S. The legal description of the project site is included as Appendix 5.5-1. The property is currently vacant. Boyajian Trucking occupied the property from December 2002 to January 2003, using it to park flatbed trucks. Prior to that, the property was occupied by E&B Trucking, Inc. from October 2002 to January 2003, who used the property for truck maintenance. The property was previously occupied by Anderson Clayton, who used the property for maintenance of vehicles and equipment associated with the operations at the Cottonseed Delinting Plant. Producers Cotton Oil Company originally developed the property with the current improvements between the late 1950s and the mid-1970s. The property was previously developed with a vineyard and a residence from at least 1937 to 1950 (PSA, 2003). The property is zoned Heavy Industrial (M-3). This zoning is intended to provide for the establishment of all industrial uses essential to the development of a balanced economic base. According to the Fresno County Zoning Ordinance, Sections 845.1-845.5, industrial zoned parcels have permitted uses of aluminum foundry, glass manufacturing, railroad repair shops, sawmills, automobile wrecking, etc. (County of Fresno, 1997). The zoning ordinance does not specifically outline the use of a natural gas fired peaking power plant; however, the development and operation of the KRCDPP has been determined to be an acceptable use (Bruzee, 2003).

The project site is geographically located within the sphere of influence of the Community of Malaga. On the community plan level, the area is included in the Roosevelt Community planning area of Fresno County. The Community of Malaga is currently pursuing incorporation. On June 13, 2003, the draft Environmental Impact

Report (EIR) for Proposed Malaga City Incorporation was released for public review. This document outlines the land use patterns and mitigation measures relating to land use for the proposed City of Malaga. Following incorporation, if it occurs, the City of Malaga would adopt the Fresno County General Plan as its own per Government Code Section 57376 (ESA, 2003) and would ultimately prepare its own General Plan.

Fresno County initially determined that the incorporation was economically infeasible. The agency that would approve the request for incorporation is the Fresno County Local Agency Formation Commission (LAFCO). LAFCO has three primary objectives, which are to encourage the orderly formation of local governmental agencies, to preserve agricultural land resources, and to discourage urban sprawl. Locally, the Fresno LAFCO is in the process of reviewing the proposed Community of Malaga incorporation. Their preliminary determination was also to deny the incorporation because it was determined to not be economically feasible. In an effort to resolve economic issues, LAFCO anticipates a response from the Community of Malaga by December relating to proposed mitigation for lost revenues between Fresno County and the proposed new City of Malaga. KRCD has reviewed the initial filing for the LAFCO and is within the proposed City of Malaga's plans for industrial development.

Since there has been no incorporation at the time of this writing, this analysis assumes that the KRCDPP will be located within the Community of Malaga in Fresno County and, therefore, is under the jurisdiction of Fresno County and the Fresno County General Plan for all ordinances, zoning and planning.

#### *5.5.2.4 Area Surrounding Project Site*

To the northeast of the project site is a five-acre parcel that is developed with a truck shop facility, and is currently vacant. Improvements to this parcel include a truck maintenance building, two storage warehouses, and a concrete tank/drum containment (PSI, 2003). The remainder of the property is undeveloped with no improvements. This parcel was previously used to park flatbed trucks and for truck maintenance. This five-acre parcel has recently been purchased and will be used for truck parking and service, which is consistent with its previous uses (PSI, 2003). Additional information on previous uses of the parcel is included in the Phase 1 Environmental Assessment that was recently completed for the property (PSI, 2003). KRCD has also received a third party reliance letter from PSA, so that KRCD may rely on the results of the Phase I that was originally prepared for another party. A copy of the Phase I and reliance letter are included as Appendix 5.5-2. Additional information on the Phase 1 is also included in Section 5.10 Hazardous Materials and Waste Management.

Also located to the northeast of the KRCDPP project site and across the Central Canal on the western side of Chestnut Avenue are 5 residences that are located on land that is currently zoned Industrial. The Central Canal is owned and operated by the Fresno Irrigation District (FID).

An industrial parcel to the east between Central Canal and Chestnut Avenue is owned by United Agricultural Products. This company constructs large plastic, stainless steel and iron tanks for agricultural uses.

Adjoining the proposed KRCPP project site to the south is a 19-acre parcel of industrial zoned land. This land has historically been farmed. Additional information on agricultural land in the area is included in Section 5.6 Agriculture and Soils. Approximately one-quarter mile south of the KRCDPP project site is storm basin AZ, which is owned and operated by the Fresno County Metropolitan Flood Control District (FCMFCD). It is located on land designated open space conservation.

The property to the north and across North Avenue is owned by Anderson Clayton Corp. The company has approximately 9 warehouses located on this section of industrially zoned land. Anderson Clayton Corp is an international company that deals in cotton processes (delinting, ginning, oil). Other commercial properties to the north are currently used by FID for its offices and equipment storage yards.

Land to the west of the proposed KRCDPP project site is a vacant 60-acre parcel of industrially zoned land that was used by Producer's Cotton Oil Company as a Cottonseed Delinting Plant until the 1980s. After the seed delinting went out of business in the 1980s, the property changed entitlements to Producer's Holding Company where it remained unused until KRCD entered into a lease agreement in March 2003 to use a portion of the property for storage of the LM6000 generators and associated equipment. The generators and equipment are currently being stored in two of the abandoned cottonseed storage barns located near the center of the property. This 60-acre parcel remains vacant and is currently for sale. KRCD is not aware of any buyers for this site.

Several large infrastructures also exist within the vicinity of the KRCDPP. These include the Union Pacific railroad line and Central Canal which run south and east of the project site, Malaga Waste Water Treatment Facility (MWWTF) located one mile southwest of the project site, and Highway 99 and Golden State Boulevard which are both located approximately one-quarter mile west of the proposed project site. These infrastructures are discussed further in other sections of this application, including Section 5.3 - Water Resources and Section 5.7 - Traffic and Transportation.

Approximately one-half mile to the southeast of the proposed KRCDPP project site is the small Community of Malaga. This area of Medium-High Density single family residential occupies approximately 60 acres and represents the largest residential area in the area of the proposed KRCDPP.

#### *5.5.2.5 Electric Transmission*

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single-circuit 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. Since there is an existing PG&E 12 kV distribution line running along the south side of North Avenue, the poles for this portion of the 12kV line would be replaced with new taller transmission poles to carry the new 115kV line above the 12kV line. Construction of the proposed transmission line within the ultimate plan line of North Avenue may require the trimming or removal of one or more mature trees.

Land uses and zoning along the transmission line route include Industrial, County Easement, and Residential, as shown on Figures 5.5-1 and 5.5-2, respectively. The area surrounding the substation includes a mix of limited agriculture, single family residential and light manufacturing.

There are 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E Malaga Substation.

#### *5.5.2.6 Natural Gas*

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. The discussion of land uses for the gas interconnection are included above in the discussion of land uses in the project area and along the transmission line route above as shown on Figures 5.5-1 and 5.5-2.

#### *5.5.2.7 Water and Sewer*

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along

Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. Land uses in the area of the preferred water interconnections include vacant property and county easements as shown on Figures 5.5-1 and 5.5-2.

The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues. The discussion of land uses for the alternative water interconnection is included in the discussion of land uses in the project area and along the transmission line route above. Land uses are also shown on Figures 5.5-1 and 5.5-2.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph.

#### *5.5.2.8 Land Use Trends*

Land use trends within the KRCDPP project area are primarily heavy industrial. There are no plans outlined by the Community of Malaga or by Fresno County General Plan to change the trend of industrial activity in the area. Typical industries in the vicinity of the proposed KRCDPP include manufacturing, distributor warehouses and heavy industrial. In communications with Fresno County Planning Department and review of the Roosevelt Community General Plan, it was determined that the County will initiate no new development or growth in the area in the near future (Bruzee, 2003). This may change if the Community of Malaga finalizes its attempts to become a City; however at the time of this writing the plan for incorporation has not been approved and no specific development plans have been identified.

The KRCDPP is near the City of Fresno's "South Fresno Industrial Revitalization" area. The plan for this area, located approximately one-half mile west of the project site is to attempt to "upgrade" existing residential, commercial, and industrial tracts. The

redevelopment project is aimed at reconstructing the corridor between State Route 99 and Golden State Freeway to make the area more attractive to industrial and commercial businesses. To do this, the City of Fresno intends to purchase small parcels of land and reassess them into larger, more usable tracts of industrial property.

#### *5.5.2.9 Recreational Facilities and Conservation Plans*

Fresno County has a wide variety of recreational resources, including regional parks, State and national parks, national forests, wilderness areas and other resources. Local park service within the area is provided by either the Fresno County Parks Division or the MCWD, depending on the location of the park (ESA, 2003). There are no local parks located within one-mile of the project site (City of Fresno, 2003).

As discussed in Section 5.15, Biological Resources, there are no habitat conservation plans or natural community conservation plans that cover the KRCDPP project area.

### 5.5.3 Laws, Ordinances, Regulations, and Standards

Land uses are both controlled and regulated through a system of plans, policies, goals, and ordinances that are adopted by the various jurisdictions with land use authority over an area. The KRCDPP and its associated linear and offsite facilities are located within the County of Fresno, in the Eastside Valley area and near the Community of Malaga. The land use issues discussed in this section have been identified and evaluated based on a review of available data including local land use policies, ordinances and goals. This section includes a discussion of federal, state and local LORS that are applicable to the proposed KRCDPP.

#### *5.5.3.1 Federal*

There have been no federal LORS or land use policies identified as applicable to the proposed KRCDPP.

#### *5.5.3.2 State*

**California Environmental Quality Act**

Under the Warren Alquist Act (Public Resources Code (PRC)) Section 25000 et. seq.), the California Energy Commission (CEC) has the responsibility for licensing all power plants in the State of California that are over 50 megawatts (MW) in capacity. Projects between 50 and 100 megawatts (MW) may be exempt from this licensing process if the CEC determines that there is no potential for substantial adverse impact on the environment or energy resources resulting from construction or operation of the facility. Projects exempt from the licensing process, including the proposed KRCDPP, are eligible for the Small Power Plant Exemption (SPPE) process (PRC Section 25541 (Amended

1999). The CEC siting process (which includes the SPPE process) has been deemed the functional equivalent to the California Environmental Quality Act (CEQA). Therefore the CEC is serving as the Lead Agency for CEQA Compliance.

### *5.5.3.3 Local*

Local land use planning policies and documents that could be applicable to the proposed KRCDPP are discussed below.

**Fresno County General Plan**

The proposed KRCDPP will be located in the County of Fresno and therefore is subject to the rules and requirements of the Fresno County General Plan (County of Fresno, 2000). The Fresno County General Plan is a comprehensive, long-term framework for the protection of the county's agricultural, natural, and cultural resources and for development in the county. The Fresno County General Plan covers the following elements or topic areas:

- Agriculture Land Use
- Transportation and Circulation
- Public Facilities and Services
- Open Space and Conservation
- Health and Safety
- Housing
- Economic Development

Each element contains goals, policies, and implementation measures that may be pertinent to the proposed KRCDPP. Applicable policies of the Fresno County General Plan, in addition to land use policies discussed in this section, are found within their respective sections of this SPPE. The Land Use policies in the Fresno County General Plan that are applicable to the KRCDPP are summarized in Table 5.5-1.

**Table 5.5-1**
**Applicable Land Use Policies − County of Fresno**
**KRCDPP**

| General Plan Element | Goal | Policy | Project Conformance |
|---|---|---|---|
| **Agriculture and Land Use Element** | | | |
| Urban Development | Goal LU-F: To encourage mixed use pedestrian and transit-oriented development | LU-F.29: The County may approve rezoning requests and discretionary permits for new | KRCD, as a public agency, is not required |

| Table 5.5-1<br>Applicable Land Use Policies − County of Fresno<br>KRCDPP | | | |
|---|---|---|---|
| **General Plan Element** | **Goal** | **Policy** | **Project Conformance** |
| **Agriculture and Land Use Element** | | | |
| | and to establish development standards for residential, commercial, and industrial development in urban and urbanizing areas. | industrial development or expansion of existing industrial uses subject to conditions that include: operational measures or specialized equipment to protect public health, safety and welfare, and to reduce adverse impacts of noise, odor, vibration, smoke, noxious gases, heat and glare, dust and dirt, combustibles and other pollutants on abutting properties. | to obtain a discretionary permit; but compliance with these conditions will be met through the CEC process. |
| | | LU-F.30: The County shall require community water and sewer services for industrial development. | The KRCDPP is located near the Community of Malaga MCWD will provide water and sewer service. |
| | | Policy LU-F.31: To the extent feasible, the County shall require that all industrial uses located adjacent to planned non-industrial use areas or roads carrying significant non-industrial traffic be designed with landscaping and setbacks comparable to the non-industrial area | The project site is in an existing industrial area that is zoned for industrial use. |
| Unincorporated City, City Fringe Area and Unincorporated Community Development | Goal LU-G: To direct urban development within city spheres of influence to existing unincorporated cities and to ensure development in city fringe area is well planned and adequately served by necessary public facilities and infrastructure and furthers countywide economic | | The project site is in an existing industrial area that is zoned for industrial use and adequate public services and infrastructure are available to |

| Table 5.5-1<br>Applicable Land Use Policies − County of Fresno<br>KRCDPP | | | |
|---|---|---|---|
| **General Plan Element** | **Goal** | **Policy** | **Project Conformance** |
| **Agriculture and Land Use Element** | | | |
| | development goals. | | serve the KRCDPP, as shown in other sections of this application. |
| Source: County of Fresno, 2000c | | | |

### Fresno County Zoning Ordinance Codes

The current Fresno County Zoning Ordinance (Division VI of Part VII of the Ordinance Code of the County of Fresno) covers all of the unincorporated areas of the county, which includes the area of the proposed KRCDPP. The Fresno County Zoning Ordinance Codes establish numerous residential, commercial, industrial and resource related ordinances. Procedures for review of Electric Utilities and Services by the County of Fresno is outlined in Section 875 of the County codes. This section applies to all electric transmission facilities and electric utility facilities, which are subject to approval by the California Public Utilities Commission (CPUC) or the CEC.

Five M-3 zoned residential properties exist east of the KRCDPP project site and along Chestnut Avenue. Pursuant to section 845.4–Uses Expressly Prohibited, the Fresno County Zoning Ordinance specifies that, "For existing residential uses, the existing residence may be used for residential purposes but may not be converted to more intensive residential…"

### Roosevelt Community Plan

The proposed KRCDPP will be located within the Roosevelt Community Planning Area of Fresno County. While the Fresno County General Plan establishes a broad policy framework that guides decision-making in the unincorporated areas of the County, individual community plans have been prepared within the framework of the overall county plan to address the unique issues and concerns arising in different unincorporated areas. The proposed KRCDPP will also be in compliance with the applicable goals and policies of the Roosevelt Community Plan.

**City of Fresno General Plan**

The City of Fresno General Plan provides a revised and updated strategy to address current issues and deficiencies and to reinforce existing community assets and improve the quality of life of the community as a whole (City of Fresno, 2002). The jurisdictional boundary between the City of Fresno and the County of Fresno is north of the KRCDPP as shown on Figure 5.5-3. The proposed KRCDPP project site is located in the County of Fresno but since the area is also close to the jurisdiction of the City of Fresno, the KRCDPP will also be in compliance with the applicable goals and policies of the City of Fresno General Plan.

### *5.5.3.4 Required Permits and Agency Contacts*

This section includes a description of the land use related permits that are required for the proposed KRCDPP and the required time to obtain them as well as applicable agency contact information.

**Encroachment Permits**

Encroachment permits will be obtained from the County of Fresno and the City of Fresno as necessary prior to the construction of linear facilities in the right-of-way of county roads.

**Fresno Irrigation District**

FID requires any developer to submit a Site Plan for review by FID. The preferred and alternative water and sewer routes cross an easement belonging to FID along its Central Canal, thus requiring Site Plan review by FID. The Site Plan Review would finalize which permits KRCDPP would be required to acquire before commencing work. Such permits may include an encroachment agreement, and a Construction of Work within Right-of- Way.

**Union Pacific Railroad**

The preferred and alternative water and sewer routes would require crossings of the Union Pacific Railroad. Any necessary permit or authorization that may be required will be obtained prior to construction.

**Agency Contacts**

Table 5.5-2 provides a list of local agencies involved in land use planning in the area of the proposed KRCDPP.

| Table 5.5-2<br>Land Use Agency Contacts<br>KRCDPP | | |
|---|---|---|
| **Permit or Approval** | **Agency Name and Address** | **Phone Number** |
| Encroachment permit for installation of pipelines and transmission line in county road right-of-ways | Fresno County Department of Public Works and Planning<br>2220 Tulare Street, 7th Floor<br>Fresno, CA 93721 | (559) 262-4078 |
| Encroachment permit for installation of transmission line in city road right-of-way | City of Fresno Department of Public Works<br>2600 Fresno Street, 4th Floor<br>Fresno, CA 93721 | (559) 621- 8650 |
| Site Plan Review for Encroachment Permit linear facilities | FID<br>2907 South Maple<br>Fresno, CA 93725 | (559) 233-7165 |
| Permit for linear facilities | Union Pacific Railroad<br>1800 Farnam<br>Omaha, NE 68102 | (402) 997-3553 |

## 5.5.4 Environmental Consequences

### *5.5.4.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant impact to land use resources. This section discusses the potential for significant impacts associated with construction or O&M of the proposed KRCDPP in relation to the checklist questions in Table 5.5-2, below.

| Table 5.5-3<br>CEQA Environmental Checklist –Land Use and Recreational Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| **LAND USE AND PLANNING –** Would the project: | | | | |
| a) Physically divide an established community? | | | | X |
| 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 | | | | X |

| Table 5.5-3<br>CEQA Environmental Checklist –Land Use and Recreational Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | | | | |
| c) Conflict with any applicable habitat conservation plan or natural community conservation plan? | | | | X |
| **RECREATION –** Would the project: | | | | |
| 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? | | | | X |
| 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? | | | | X |

### *5.5.4.2 Impact Assessment*

The land use issues for the proposed KRCDPP have been identified and evaluated based on on-site reconnaissance surveys, a review of current U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps, aerial photography, a review of local land use ordinances, policies and goals identified in the Fresno County General Plan (County of Fresno, 2000c), associated maps and other related documents, as cited in Section 5.5.7 References.

### *5.5.4.3 Land Use Impacts*

The proposed KRCDPP will not result in any significant impacts to land use. Development of the KRCDPP is an acceptable use based on existing zoning and land use designations for Fresno County, the jurisdiction where the project is located. Land use impacts associated with the proposed KRCDPP will not be significant because the activities are compatible with existing land uses and contribute to the continued use of the industrially zoned area for industrial purposes.

#### *5.5.4.4 Recreational and Conservation Plan Impacts*

There are no recreational areas and no conservation planning areas within the area of the proposed KRCDPP. The proposed KRCDPP would not result in any impacts to either recreational areas or conservation planning areas.

### 5.5.5 Proposed Mitigation Measures

The construction and O&M of the proposed KRCDPP and linear facilities would be in compliance with all applicable land use policies. The proposed KRCDPP would not result in any significant unavoidable adverse impacts to land use, therefore no mitigation measures are proposed.

### 5.5.6 Cumulative Impacts

In communication with Fresno County Planning Department, there are no development plans currently under review in the project area (Bruzee, 2003). Projected development for the Community of Malaga is outlined in the Roosevelt Community Plan generated by the City of Fresno. KRCDPP proposed use for the land in this area is in agreement with the Roosevelt Community Plan.

Also, as previously stated, Fresno County currently has no plans to initiate new development or growth in the area in the near future (Bruzee, 2003). This may change if the Community of Malaga finalizes its attempts to become a City; however at the time of this writing the plan for incorporation has not been approved and no specific development plans have been identified.

The proposed KRCDPP will not contribute to any conflicts in current and planned land use designations, zoning, or policies. The proposed KRCDPP constitutes land uses compatible to the commercial and industrial nature of the area and is consistent with current land use designations, zoning, goals and policies of the area. No cumulative impacts to land use have been identified for the proposed KRCDPP.

### 5.5.7 References

Airphoto USA, 2002. Aerial Photograph flown by Airphoto USA, 2002.

Bruzee, Joe, 2003. Planning Services of Fresno County, Fresno CA. Personal Communication. August 2003.

City of Fresno, 2002. 2025 Fresno General Plan and related Draft Environmental Impact Report No. 10130. Planning and Development Department Advance Planning, February 1, 2002.

City of Fresno, 2003. Public Services GIS map at: http://dpuweb.ci.fresno.ca.us/dpu.htm

County of Fresno, 1993. Roosevelt Community Plan Update and Draft Environmental Impact Report. SCH No. 90021238. Public Works and Development Services Department. June 1993.

County of Fresno, 1997. Fresno County Zoning Ordinances. Public Works and Development Services Department, 1960 (amended 1997).

County of Fresno, 2000a. Draft Environmental Impact Report. General Plan Update. February 2000.

County of Fresno, 2000b. Draft Environmental Impact Report. General Plan Update. August 2000

County of Fresno, 2000c. Fresno County General Plan Policy Document. General Plan Update. October 3, 2000.

County of Fresno, 2000d. *Fresno County General Plan Background Report*. Fresno, California. October 2000.

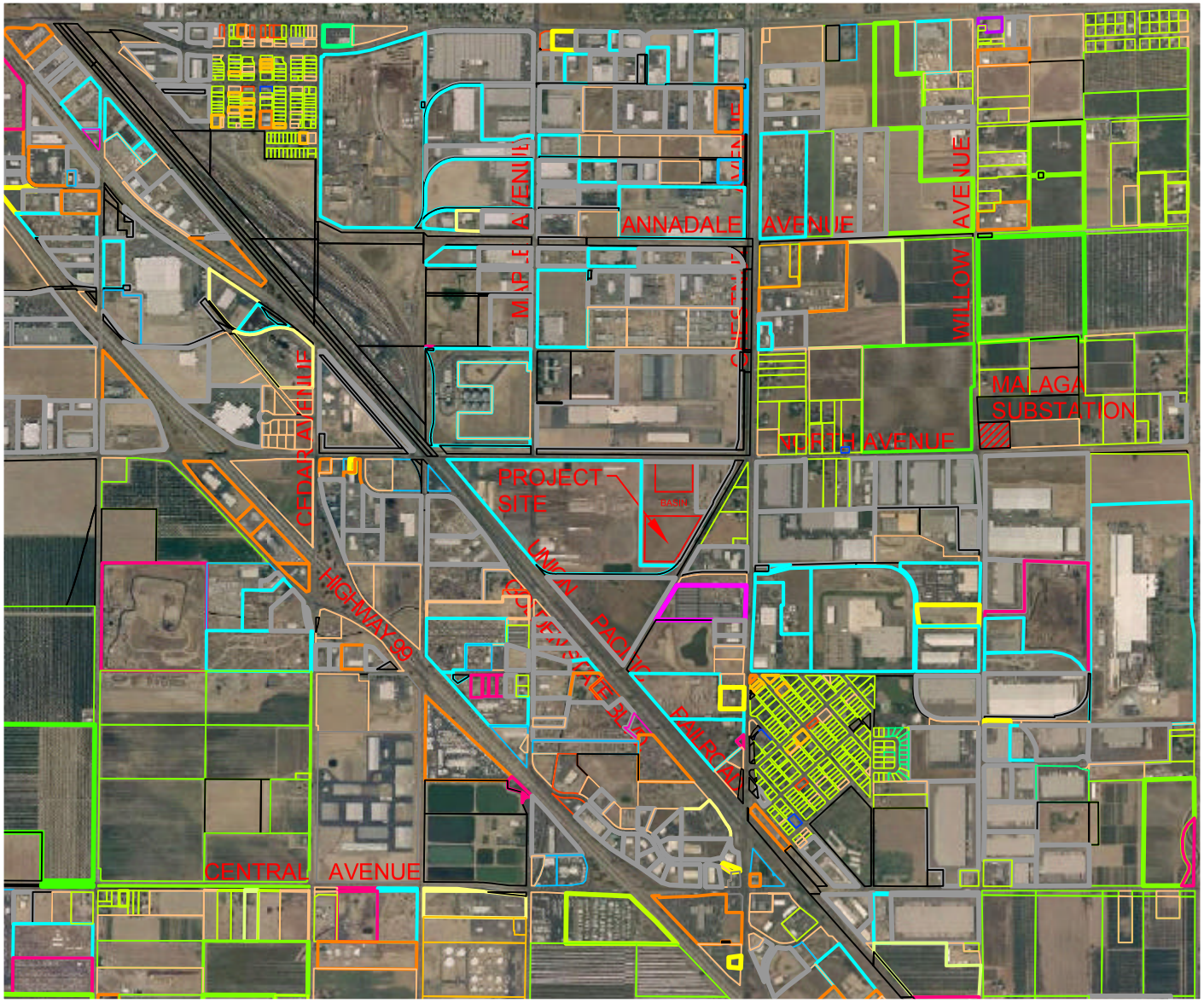
Environmental Science Associates (ESA), 2003. *Proposed Malaga City Incorporation*. Draft Environmental Impact Report. Sacramento, California. June 13, 2003.

First American Real Estate Solutions, L.P., 2003. Metroscan for Windows v3.0. Santa Ana, California.

Garcia, Anthony, 2003. GIS Analyst, Fresno, CA. Personal communication. May 2003.

Professional Service Industries, Inc., 2003. *Phase 1, Environmental Site Assessment*. Long Beach, California. May 6, 2003.

S:\Design Engineering\Projects\116289\40620\FIGURE 5.5-1.dwg, 11/21/2003 02:33:19 PM




## LEGEND

- UNCLASSIFIED
- 000 - VACANT
- A02, A03, A04, A06 — APARTMENTS
- ALM
- ASC
- CAW
- CHU
- COG
- COS
- CS1
- CS2
- CS4
- CS6
- FAC
- FIE
- FII
- FTM
- GAR
- GO1
- GO3
- GO8
- GRA
- LII
- LIM
- LUY
- M12
- M18
- MHP
- MNS
- NEC
- OIL
- OM1
- PCI
- PEA
- PLU
- PSL
- PUB
- RES
- S00
- S01
- S02
- S03
- S05
- SES
- SFS
- SM2
- SM3
- SS1
- TRX
- TVX
- VIR
- VIT
- VLM
- WAH
- XXX

N

GRAPHIC SCALE
1000 500 0 1000 2000
IN FEET

KRCD
Kings River Conservation District

# FIGURE 5.5-1

Primary Land Use Designations
In The KRCDPP Project Area

KRCDPP

09/30/03 REV. 0

**TABLE #7 FRESNO COUNTY ASSESSOR'S OFFICE - PROPERTY USE CODES (REVISED 5-31-01)**

**SINGLE FAMILY RESIDENTIAL PROPERTIES - S**
**MULTI-FAMILY RESIDENTIAL PROPERTIES - M**
**PLANNED UNIT DEV & CONDOS - RES. - P**

| | | | |
|---|---|---|---|
| Single Family Residential | S | | * |
| Single Family & Manufactured Home | S | M | * |
| Only Manufactured Home | O | M | * |
| Apartment | A | | * |
| Potential Subdivision (Primary) | P | O | S |
| Manufactured Home Park | M | H | P |
| MH on Permanent Foundation | M | H | * |

**AGRICULTURAL PROPERTIES - A**
**FARMLAND SECURITY ZONE PROPERTIES - Z**
**OPEN SPACE PROPERTIES - O**

| | | | |
|---|---|---|---|
| Almonds | A | L | M |
| Apples | A | P | P |
| Apples - Fuji | A | F | U |
| Apples - Gala | A | G | A |
| Apples - Granny Smith | A | G | R |
| Apples - Mixed | A | P | X |
| Apricots | A | P | R |
| Artichokes | A | R | T |
| Asparagus | A | S | P |
| Avocados | A | V | O |
| Bushberries | B | U | S |
| Cherries | C | H | E |
| Dairy | D | A | I |
| Dry Farming | D | R | Y |
| Eucalyptus Grove | E | U | C |
| Exotic | E | X | O |
| Feed Lot | F | E | E |
| Field Cropland | F | I | E |
| Figs | F | I | G |
| Hot House | H | O | H |
| Kiwi | K | I | W |
| Lemons | L | E | M |
| Nectarines | N | E | C |
| Olives | O | L | I |
| Oranges | O | R | A |
| Pasture - Native | P | A | S |
| Peaches | P | E | A |
| Pears | P | R | S |
| Pecans | P | E | C |
| Persimmons | P | E | R |
| Pistachios | P | I | S |
| Plums | P | L | U |
| Pomegranates | P | O | M |
| Poultry | P | O | U |
| Prunes | P | R | U |
| Stables | S | T | A |
| Timberland | T | I | M |
| Timber Preserve Zone | T | P | Z |
| Trees - Mixed | T | R | X |
| Trees - Vines Mixed | T | V | X |
| Vines - Mixed | V | I | X |
| Vines - Raisin Variety | V | I | R |
| Vines - Table Variety | V | I | T |
| Vines - Wine Variety | V | I | W |
| Walnuts | W | A | L |
| Xmas Tree Farm | X | M | A |

***UNDER ALL CODES***

| | | | |
|---|---|---|---|
| Other | X | X | X |
| Partially Completed Imps | P | C | I |
| Ponding Basin | P | N | D |
| Vacant | 0 | 0 | 0 |
| Outlot & Common Area | 0 | U | T |
| Publicly Owned | P | U | B |
| Temporary Use Code | T | T | T |
| Pipeline Right of Way | A | X | X |
| Pump Site | A | 0 | 0 |
| Cell Tower Sites | T | W | R |

**COMMERCIAL PROPERTIES - C**
**INDUSTRIAL PROPERTIES - I**

| | | | |
|---|---|---|---|
| Auto Ser. Cen. & New Car Sales | A | S | C |
| Bank (Financial Inst.) | F | I | I |
| Bowling Alley | B | O | A |
| Car Wash | C | A | W |
| Church | C | H | U |
| Club House | C | L | H |
| Cold Stg. & Slaughter House | C | O | S |
| Commercial Store(s) | C | S | * |
| Convalescent Hospital | C | O | H |
| Cotton Gin & Compress | C | O | G |
| Department Store | D | E | S |
| Discount House | D | I | H |
| Factory | F | A | C |
| Fraternal Lodge | F | R | L |
| Fraternity (Social) House | S | O | H |
| Fresno Air Terminal P I's | F | A | T |
| Freight Truck Terminal | F | T | M |
| Funeral Home | F | U | H |
| Garage | G | A | R |
| Gas Only; Pet. Div. Only | G | A | S |
| General Office | G | O | * |
| Golf Course | G | O | C |
| Granary & Rice Mill | G | R | A |
| Hospital | H | O | S |
| Hotel | H | | * |
| Labor Housing | L | A | B |
| Light Industrial | L | I | I |
| Light Manufacturing | L | I | M |
| Lumber Yard | L | U | Y |
| Medical-Dental Office | M | D | * |
| Mine | M | I | N |
| Mini Storage | M | N | S |
| Motel | M | | * |
| Nursery (Plants) | N | U | R |
| Oil & Gas 'C' is Bulk Plant | O | I | L |
| Packing House | P | A | H |
| Parking/Sales Lot (Used Cars) | P | S | L |
| Recreation | R | E | C |
| Restaurant | R | E | S |
| Sand-Gravel Pit | S | G | P |
| Savings & Loan (Fin. Inst.) | F | I | I |
| School & Day Nursery | S | C | H |
| Service Station | S | E | S |
| Shopping Center (Neighborhood) | S | C | N |
| Shopping Center (Community) | S | C | C |
| Shopping Center (Regional) | S | C | R |
| Shopping Center (Mini) | S | C | Q |
| Small Food Store '7-11' Type | S | F | S |
| Sorority (Social) House | S | O | H |
| Suburban & Country Store(s) | S | S | * |
| Super Market | S | U | M |
| Theater | T | H | E |
| Theater Drive-In | T | H | D |
| Warehouse | W | A | H |
| Winery | W | I | N |
| Water Company | W | A | C |
| Water Rights | W | A | R |

***SECONDARY USE ONLY***

| | | | |
|---|---|---|---|
| Condominium | C | | * |
| Planned Unit Development | P | | * |
| Sec. 401.4 Special Code | H | B | U |
| Vacant Land with Minor Imps Only | V | L | M |
| Manufactured Home Park | | | * |

**Enter No. Of Units. If there are more units than available digits, enter the highest number possible.*

S:\Design Engineering\Projects\116289\40620\FIGURE 5.5-2a.dwg, 11/24/2003 11:38:18 AM

KRCD
Kings River Conservation District

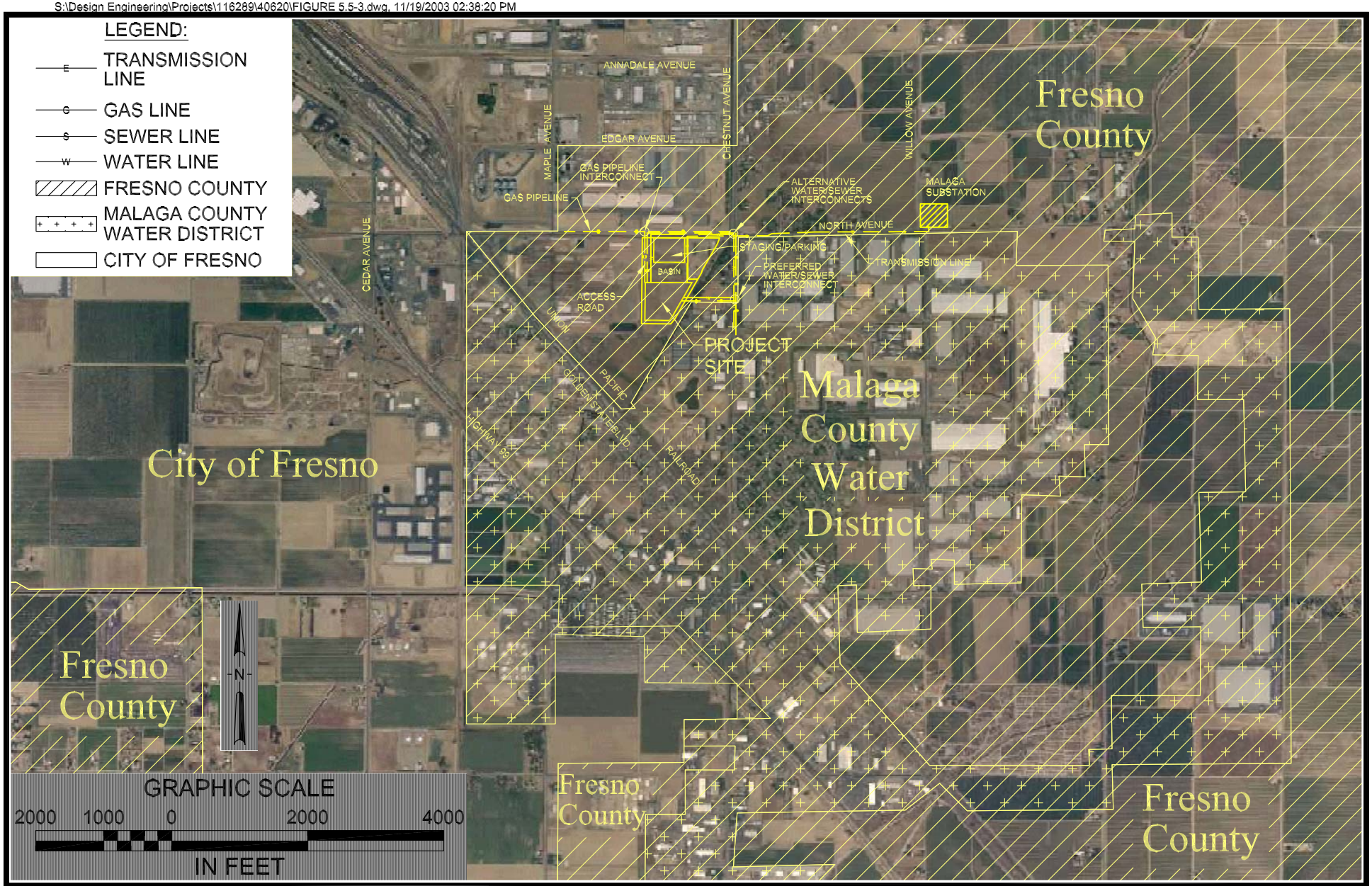
# FIGURE 5.5-2

Zoning Designations In The
KRCDPP Project Area

**KRCDPP**

09/30/03 REV. 0

S:\Design Engineering\Projects\116289\40620\FIGURE 5.5-3.dwg, 11/19/2003 02:38:20 PM




KRCD
Kings River Conservation District

FIGURE 5.5-3

Existing Jurisdictions in the KRCDPP Project Area

KRCDPP

09/30/03 REV. 0

# SECTION 5.6 AGRICULTURE AND SOILS

## 5.6.1 Introduction

This section includes a discussion of the agriculture and soil found in the vicinity of the Kings River Conservation District Peaking Plant (KRCDPP) and discusses the potential for impacts to agricultural lands and soil resources associated with the construction, and operation and maintenance (O&M) of the proposed KRCDPP. The affected environment section provides a discussion of the regional setting, project site and vicinity and associated linear facilities. A discussion of soil types found in the KRCDPP project area as well as KRCDPP conformance and with applicable federal, state and local laws, ordinances, regulations and standards (LORS) are also included.

## 5.6.2 Affected Environment

### *5.6.2.1 Regional Setting*

The proposed KRCDPP is located in Fresno County in the center of the San Joaquin Valley, which stretches approximately 100 miles from the Coast Range foothills to the eastern slope of the Sierra Nevada. The KRCDPP project area is located in the Eastside Valley geographic area, which is located in the middle of Fresno County and includes the most urbanized area of the county. Land uses in this area generally consist of a mixture of urban and rural, residential, commercial, and agricultural uses (County of Fresno, 2000a). Since the early 1950s, Fresno County has been a leading agricultural county in the United States in the value of farm products and therefore the county practices careful land use decision-making that is essential to minimizing the conversion of productive agricultural land.

### *5.6.2.2 Soil Types*

This section discusses soil types found within the KRCDPP project area, including the project site and along the routes of associated linear facilities. Soil resource information was obtained from the United States Department of Agriculture (USDA) Soil Survey for the Eastern Fresno Area. Soil types in the project area are shown on Figure 5.6-1.

**Project Site and Parking/Staging Area**

KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres, which includes an existing 4-acre basin, would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would

be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site. The project site, staging area and associated linear facilities are also shown on Figure 5.6-1. The project site is currently vacant and is zoned industrial (M-3). Additional information on the KRCDPP project site is included in Section 5.5, Land Use.

The KRCDPP project site has a convergence of three soil series types including Hanford fine sandy loam (Ho), Hanford sandy loam (Hc), Hesperia fine sandy loam (Hst), which are described in detail below. Descriptions of the soil types on the project site and in the project area are also provided in Table 5.6-1, below.

## Table 5.6.1
## Summary of Soil Mapping Unit Properties
## KRCDPP

| Map Symbol | Soil Series | | Depth (in feet) to Bedrock or Hardpan/ Seasonal High Water | Texture | Permeability (Inches/Hour) | Drainage | Erosion Potential | | Land Capability | Storie Index | pH | USCS Classification | Salinity (mmhos/cm @20C) | Important Farmland Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Slope (%) | Water/Wind Erosion Hazard | | | | | | |
| ApA | Atwater | PV | 5+ | loamy sand | 5.0 - 10.0 | moderate | 0-3 | slight/none | IIIs-3 (17) | 52 | 6.1 to 6.2 | SM | <1 | FSI |
| ArA | Atwater | PV | 5+ | sandy loam | 5.0 - 10.0 | moderate | 0-3 | slight/none | IIs-4 (17) | 88 | 6.1 to 6.2 | SM | <1 | Prime |
| Dha | Delhi | PV | 5+ | loamy sand | 5.0 - 10.0 | rapid | 0-3 | slight/none | IIIs-4 (17) | 72 | 6.4 to 6.9 | SM | <1 | FSI |
| DhB | Delhi | PV | 5+ | loamy sand | 5.0 - 10.0 | rapid | 0-3 | slight/none | IIIs-8 (17) | 68 | 6.4 to 6.9 | SM | <1 | FSI |
| Es | Exeter | LF | 1-3 | sandy loam | 2.5 - 5.0 | very slow | 0-9 | slight/none | IIIs-8 (17) | 42 | 6.9 to 7.4 | SM or ML | <1 | FSI |
| Gta | Greenfield | PV | 5+ | sandy loam | 2.5 - 5.0 | moderate | 0-3 | slight/none | I-1 (17, 18) | 90 | 6.3 to 7.3 | SM | <1 | Prime |
| Hc | Hanford | S, LF | 5+ | sandy loam | 2.5 - 5.0 | moderate | <3 | slight/none | IIs-4 (17) | 95 | 6.4 to 6.8 | SM | <1 | Prime |
| Hk | Hanford | PV | 5+ | sandy loam | 2.5 - 5.0 | moderate | <2 | slight/none | IIIs-3 (17) | 71 | 6.4 to 6.8 | SM | <1 | FSI |
| Hm | Hanford | PV | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | 0-3 | slight/none | I-1 (17, 18) | 100 | 6.4 to 6.8 | ML or SM | <1 | Prime |
| Ho | Hanford | S, LF | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | <3 | slight/none | IIs-3 (17) | 95 | 6.4 to 6.8 | ML or SM | <1 | Prime |

**Table 5.6.1**
**Summary of Soil Mapping Unit Properties**
**KRCDPP**

| Map Symbol | Soil Series | | Depth (in feet) to Bedrock or Hardpan/ Seasonal High Water | Texture | Permeability (Inches/Hour) | Drainage | Erosion Potential | | Land Capability | Storie Index | pH | USCS Classification | Salinity (mmhos/cm @20C) | Important Farmland Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Slope (%) | Water/Wind Erosion Hazard | | | | | | |
| Hsd | Hesperia | PV | 5+ | sandy loam | 2.5 - 5.0 | moderate | <3 | slight/none | IIs-4 (17) | 95 | --- | SM | <4 | Prime |
| Hsm | Hesperia | S, LF | 5+ | sandy loam | 2.5 - 5.0 | moderate | <3 | slight/none | IIs-3 (17) | 90 | --- | SM | <4 | Prime |
| Hsr | Hesperia | PV | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | 0-3 | slight/none | I-1 (17, 18) | 100 | --- | SM | <4 | Prime |
| Hss | Hesperia | PV | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | <2 | slight/none | IIs-6 (17) | 60 | --- | SM | <4 | Prime |
| Hst | Hesperia | LF | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | <3 | slight/none | IIs-3 (17) | 95 | --- | SM | <4 | Prime |
| Hsy | Hesperia | LF | 5+ | fine sandy loam | 2.5 - 5.0 | moderate | <2 | slight/none | IIIs-6 (17) | 57 | --- | SM | <4 | FSI |
| Pa | Pachappa | PV | 5+ | loam | 0.8 - 2.5 | moderate | 0-3 | slight/none | I-1 (17, 18) | 95 | --- | ML or CL | <4 | Prime |
| Pk | Pits | PV | 5+ | --- | --- | --- | --- | --- | VIIIw-4 (17) | 5 | --- | --- | --- | None |
| TzbA | Tujunga | PV | 5+ | loamy sand | 5.0 - 10.0 | rapid | 0-3 | slight/none | IIIs-4 (17) | 76 | --- | SM | <1 | FSI |

## Table 5.6.1
## Summary of Soil Mapping Unit Properties
## KRCDPP

| Map Symbol | Soil Series | | Depth (in feet) to Bedrock or Hardpan/ Seasonal High Water | Texture | Permeability (Inches/Hour) | Drainage | Erosion Potential | | Land Capability | Storie Index | pH | USCS Classification | Salinity (mmhos/cm @20C) | Important Farmland Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Slope (%) | Water/Wind Erosion Hazard | | | | | | |

Source: Soil Survey, Eastern Fresno Area, California. 1971. United States Department of Agriculture

Acronyms:
S – KRCDPP project Site
PV – Project Vicinity
LF -KRCDPP Linear Facilities
USCS – Unified Soil Classification System
SM – Silty Sand
ML = Silt
CL - Clay
mmhos/cm@20C –millimhos per centimeter at 20 Celsius
FSI – Farmland of Statewide Importance
Prime – Prime Farmland

### Hanford Fine Sandy Loam

This soil typically produces well and responds favorably to good management. It is used extensively to grow raisin grapes, peaches and plums, and some walnuts. Alfalfa and cotton are also grown on this soil and it is well suited for many other crops such as irrigated barley, corn, grain sorghum, truck crops, berries, melons and sugar beets (USDA, 1971, pg. 81)

Most Ho soils are moderately deep to deep, are moderately well drained or well drained, and have a slowly permeable, partly consolidated substratum at a depth below 18 inches. The substratum is weakly cemented or compact, and is silty. Slopes are typically less than 3 percent. Available water holding capacity ranges from 5.0 to 7.5 inches (USDA, 1971, pg. 163).

Other characteristics of Ho soils include: Capability unit rating of IIs-3 (17), natural land type category – A2, Storie Index rating of 95, and range site not assigned (USDA, 1971, pg. 81).

### Hanford Sandy Loam

This soil is sandy loam throughout, but otherwise is similar to Ho soil. Because of the coarser texture, the available water holding capacity is moderate, slightly lower than that of Ho soil (USDA 1971, pg 81). The use and management of Hc are similar to those of Ho, as described above. Somewhat more frequent irrigations are generally required for field crops on Hc soils (USDA, 1971, pg. 81).

The land type Sandy alluvial land, leveled, is included with the soils in this unit. Most of the Hc soils are well drained or have improved drainage, are nearly level, and are very deep (USDA, 1971, pg. 164). Slopes are less than 3 percent. Available water holding capacity is 5 inches or more for the 5-foot rooting depth. Permeability is mostly moderately rapid (Ibid).

Other characteristics of Hc soils include: Capability unit IIs-4 (17), natural land type - A7; Storie index rating 70 and range site is not assigned (USDA, 1971, pg. 81).

### Hesperia Fine Sandy Loam

The texture of this soil in the surface layer and underlying material is mainly fine sandy loam, but it is very fine sandy loam in small areas. The surface layer is neutral to mildly alkaline and the underlying material is mildly to moderately alkaline. The zone of lime accumulation varies greatly in thickness. In many places the lower limit of significant lime accumulation occurs below a depth of 6 feet. (USDA, 1971, pg. 83). The soil is

moderately permeable. The permeability of an undisturbed part of the underlying material is moderately slow. However, this material as a whole offers only a slight restriction to internal drainage because it is broken in places or because of the presence of burrows in the material (Ibid).

The Hst soil, moderately deep, is suited to most crops adapted to the climate of the area. With good management, raisin and table grapes, peaches, plums, walnuts, alfalfa, irrigated barley, corn cotton, grain sorghum, irrigated pasture, and sugar beets are grown successfully on Hst soil. Most of the soil is used for vineyards and for cotton followed by alfalfa. According to the crop grown, irrigation is mainly through furrows between border checks. The soil is generally leveled and planed to control surface water applications (USDA, 1971, pg. 84).

Most of these soils are moderately deep-to-deep, are moderately well drained or well drained, and have a slowly permeable, partly consolidated substratum at a depth below 18 inches. The substratum is weakly cemented or compact, and is silty. Slopes are less than 3 percent. Available water holding capacity ranges from 5.0 to 7.5 inches (USDA, 1971, pg. 163).

Other characteristics of Hst soils include: Capability unit IIs-3 (17), natural land type-A2; Storie index rating 95, and range site not assigned (UDSA, 1971, pg. 84).

### Linear Facilities

The following describes the soils located along the linear facilities proposed as part of the KRCDPP. Additional information on the linear facilities associated with the KRCDPP is included in Chapter 2, Project and Facility Description. The soil types are also shown on Figure 5.6-1 and additional information was included above in Table 5.6-1.

### Electric Transmission Line

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new

taller transmission poles, which would carry the new 115kV line above the 12kV line. The soil types found along the transmission line corridor include Hc, Hesperia fine sandy loam (Hsy), Exeter sandy loam (Es) and Hst. The Hc and Hst soil types are the same as some of the soil types on the project site and are described above.

**Hesperia Fine Sandy Loam**

The profile of this soil is moderately deep, but is saline-alkali affected. The fine sandy loam underlying material and, in may places, the silty layer below it are strongly alkaline and generally at least slightly saline from salt accumulations.

Without irrigation, undeveloped areas of this soil are used for alkali pasture. With irrigation but without reclamation, few crops can be profitably grown on the soil except irrigated pasture. With reclamation, irrigated field crops such as alfalfa, cotton, barley, grain sorghum, corn and sugar beets can be grown successfully.

Other characteristics of Hsy soils include: Capability unit IIIs-8 (17); natural land type - C13; Storie index rating 42 and range site not assigned (USDA, 1971, pg. 84).

**Exeter Sandy Loam**

This soil is widely distributed over the alluvial terraces of the San Joaquin River. It is also located, but not so extensively, on terraces of the Kings River and of other smaller streams. A typical profile has a surface layer of brown light yellowish brown sandy loam about 15 inches thick. This is underlain by a brown or yellowish brown sandy loam subsoil that is mildly alkaline and slightly finer textured extending to a depth of about 30 inches. Permeability is very slow because of the hardpan. Runoff for the most part is medium, but ponded in swales of areas that have hummockey microrelief.

This soil is used for many kinds of crops. Figs peaches, plums, and oranges are grown. The management of all irrigated crops on this soil must take into account the presence and effect of the hardpan. Normally the hardpan is ripped and shattered to deepen the soil and to speed its internal drainage. For most crops, the amount of irrigation water applied at any time should be controlled to avoid the building up of saturated layers in the subsoil, which can damage or impair root growth (USDA, 1971, pg. 61).

Other characteristics of Es soils include: Capability unit IIIs-6 (17), natural land type A2-2s, Storie index rating 57 and range site not assigned (USDA, 1971, pg. 61).

### Water and Sewer Interconnections

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Wastewater from domestic wastes will also be discharged to the MCWD sewer system. Currently, the KRCD is considering two routing alternatives for a water interconnection. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The sewer interconnection would be located in the same right-of-way. The soil types found along the preferred water and sewer interconnection corridor include Hst, Ho, Hc, all of which are discussed above.

The proposed interconnection for the secondary alternative would run north from the project site and along the south side of North Avenue for approximately 2000 feet to the intersection of North and Chestnut Avenues. The sewer interconnection would be located in the same right-of-way. The soil type found along the alternative water and sewer interconnections is Hsy, Hst, Hc, and Ho, which are discussed above.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. The only interconnection required for wastewater for the KRCDPP is for domestic use, as described above.

### Natural Gas

Natural gas for the KRCDPP will be provided from an existing PG&E gas transmission line located along North Avenue. The interconnection for is approximately 700 feet and would be located from the project site and north along the 9.5 acres north of the project site to North Avenue. The soil types in the area of these linear facilities are included in the discussion of the project site and transmission line above.

### Area Surrounding Project Site

Including those soil types previously identified, there are nineteen different soil types found at the project site along the linear facilities or within a one-mile radius of the proposed KRCDPP. Figure 5.6-1 also shows the soil types in the area. Descriptions of the soil properties of all these soil types can be found in Table 5.6-1. Soils characteristics in Table 5.6-1 include applicable information including depth, texture, drainage,

permeability, erosion hazard rating, land capability classification, slope, salinity, and Storie Index Ratings (which are used as an indicator of the soils revegetation potential).

### *5.6.2.3 Areas of Agricultural Significance/Use*

Portions of the KRCDPP site were previously developed with a vineyard and residence from at least 1937 to 1950 (PSI, 2003). The site and adjacent parcels are not known to have any other past agricultural uses.

#### Williamson Act

The California Land Conservation Act of 1965 (or the Williamson Act) established a voluntary tax incentive program for preserving both agricultural and open space lands. The act reduces property taxes in return for the guarantee that the property will remain in agriculture for not less than 10 years, thereby slowing down the conversion of agricultural land. In Fresno County, 1.5 million acres of farmland are within Williamson Act agricultural preserves (Laumer, 2003), primarily within the unincorporated areas of the county. The proposed KRCDPP is not subject to the Williamson Act (ESA, 2003). There are several parcels that are under Williamson Act contracts within 2 miles of KRCDPP. These parcels are primarily to the north and east of the KRCDPP project site. The closest Williamson Act land is 1 mile to the east of the KRCDPP, as shown on Figure 5.6-2.

#### Prime Farmland

Prime Farmland is land, which has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods. Prime Farmland must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

Based on the above descriptions and soil characteristics, the KRCDPP project site could be classified as that of Prime Farmland. According to a recent Phase I Environmental Assessment; however, the site has not been farmed or irrigated in nearly 70 years and therefore doesn't meet the requirements above for the classification of Prime Farmland (PSI, 2003). Within the project area, at approximately 0.5 miles to the northeast of the project site are some properties denoted by the United States Department of Conservation (USDOC) as Prime Farmland (USDOC, 2003). This area is shown on Figure 5.6-2. The agriculture in that area are mixed with single-family residential and warehouse structures.

Typical agriculture in the area northeast of the project site consists of olives, corn, cotton and vineyards.

There is also an area along the southern border of the project site that is denoted as Prime Farmland. This 19-acre parcel generally grows vineyards. To receive this designation, the property has been surface irrigated for at least the last two mapping cycles. The Fresno County General Plan lists this 19-acre parcel as zoned Industrial with a primary land use designation for a warehouse. Figure 5.6-2 shows the agricultural uses in the project area.

**Farmland of Statewide Importance**

Farmland of Statewide Importance is land other than Prime Farmland, which has a good combination of physical and chemical characteristics for the production of crops. It must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

Based on the above descriptions, the site soil characteristics along the transmission route could be classified as Prime Farmland or Farmland of Statewide Importance. The proposed KRCDPP transmission line route will proceed along the existing right-of-way of North Avenue. Wooden distribution poles currently exist along the north and south sides of North Avenue. There is no agricultural land in the area in or around the proposed transmission line route, nor has the area been irrigated for agriculture in recent years; therefore the area doesn't meet the requirements above for the classification of Prime Farmland or Farmland of Statewide Importance.

There is no Farmland of Statewide Importance identified at or near the project site or its associated linear facilities.

**Unique Farmland**

Unique Farmland is land which does not meet the criteria for Prime Farmland or Farmland of Statewide Importance, but that has been used for the production of specific high economic value crops at some time during the two update cycles prior to the mapping date. It has special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to current farming methods. Examples of such crops may include oranges, olives, avocados, rice, grapes, and cut flowers. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

There is no Unique Farmland identified within the project area including the project site and its associated linear facilities.

### 5.6.3 Laws, Ordinances, Regulations, and Standards

Applicable LORS that apply to agricultural and soil resources for the KRCDPP are summarized below.

#### *5.6.3.1 Federal*

**Federal Water Pollution Control Act of 1972 (Clean Water Act of 1977 (including 1987 amendments)**

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), establishes requirements for discharges of storm water or wastewater from any point source that would affect the beneficial uses of waters of the United States. The Regional Water Quality Control Board (RWQCB), by authority of the State Water Resources Control Board (SWRCB) administers compliance with the CWA. In the case of the KRCDPP, compliance will be implemented and enforced by the Central Valley RWQCB (CVRWQCB) Fresno Office.

There are two permitting options for storm water discharges, the individual permit and the General Permit. The General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (Permit No. CAS000002), also known as the General Construction Permit, is required for all construction activities that involve more than five acres of land disturbance. Modifications to the General Permit, which were adopted in late 2002, expanded the National Pollutant Discharge Elimination System (NPDES) program by lowering the threshold acreage of soil disturbance requiring permit coverage from five acres to one acre. The program modification became effective in March 2003. The KRCDPP will be subject to the requirements of the General Construction Permit.

The General Permit for the KRCDPP will address the quality of surface water leaving the site, and soil erosion and sedimentation associated with the construction activities on the project site and along the associated linear facilities. To be covered under the General Permit, a Notice of Intent (NOI) must be completed and a Storm Water Pollution Prevention Plan (SWPPP) must be prepared. A draft Construction SWPPP, which includes the NOI, is included as Appendix 5.3-3, in Section 5.3, Water Resources.

**United States Department of Agriculture (USDA) Engineering Standards**

The USDA, Natural Resources Conservation Service's National Engineering Handbook provides standards for soil conservation during planning, design and construction

activities. The proposed KRCDPP will conform to applicable standards in the National Engineering Handbook, including Section 3 (Sedimentation) to ensure that the project will not cause soil loss through accelerated erosion. The proposed mitigation measures described below and in the draft SWPPP (Appendix 5.3-3) identify steps to be taken during grading and construction to limit soil erosion caused be soil disturbance.

#### *5.6.3.2 State*

**Porter-Cologne Water Quality Control Act of 1972. California Water Code. California Code of Regulations, Title 23, Sections 13000 et seq.**

The California Water Code controls pollutant discharges to surface and groundwater be regulating storm water discharge and protects water quality by appropriate design, sizing and construction of erosion and sediment controls. The discharge of soils into surface waters resulting from land disturbance may require the filing of a report of waste discharge (Water Code Section 13260a). As with the CWA, the SWRCB has the ultimate authority over state water rights and water quality policy, however, the RWQCB has been delegated to oversee water quality on a day-to-day basis at the local/regional level. In the case of the KRCDPP, compliance will be implemented and enforced by the CVRWQCB Fresno Office.

The KRCDPP will implement Best Management Practices (BMPs) and appropriate mitigation measures to ensure that waste soils are not discharged during grading and construction activities and to protect surface watercourses. The BMPs and mitigation measures are discussed below in Section 5.6.5 and are also discussed in the draft SWPPP, which is included as Appendix 5.3-3, in Section 5.3, Water Resources.

**California Land Conservation Act of 1965 (Williamson Act)**

As previously described, the Williamson Act established a voluntary tax incentive program for preserving both agricultural and open space lands and act reduces property taxes in return for the guarantee that the property will remain in agriculture for not less than 10 years. There is Williamson Act land in the area of the KRCDPP, but none that will be converted or taken out of production as a result of the proposed KRCDPP.

#### *5.6.3.3 Local*

**County of Fresno General Plan**

One of the central goals of the County General Plan is to help maintain its agricultural economy and reduce the conversion of productive agricultural land. For this reason the county has developed a goal and policy framework to protect agricultural activities from incompatible uses and to maintain agriculturally designated areas for agriculture uses. This is accomplishes by promoting long-term conservation of productive and potentially

productive agricultural lands and accommodating agricultural support services and agriculture related activities that support the viability of agriculture and promote the county's economic development goals.

The proposed KRCDPP is consistent with the County of Fresno's goals and policies related to the protection of agricultural lands and will not impact or results in the conversion of any lands that are used for agricultural purposes.

**City of Fresno General Plan – Resources Element**

The proposed KRCDPP will also comply with the City of Fresno General Plan Resources Element, which is important to the long-term development potential of Fresno and depends heavily on the quantity, quality and cost-effective availability of resources to support expected population growth and development.

#### *5.6.3.4 Required Permits and Agency Contacts*

The KRCDPP will also require several permits and authorizations from agencies whose responsibility is to protect agricultural and soil resources. Permits likely required by the KRCDPP and the applicable regulatory contacts are discussed below in Table 5.6-2.

**Table 5.6-2**
**Required Permits and Agency Contacts – Agriculture & Soils**
**KRCDPP**

| Permit or Approval | Applicability/Schedule | Agency Address/Phone |
|---|---|---|
| Storm water Permit for Construction Activities (General Construction Permit) | Required to regulate the discharge of storm water during construction.<br><br>Will be obtained prior to construction. A draft of the construction SWPPP is included as Section 5.3, Water Resources Appendix 5.3-3. | CVRWQCB<br>1685 E Street<br>Fresno, CA 93706<br>(559) 445-5116 |
| Storm water Permit for Industrial Activity | Required to regulate surface runoff during project operations.<br><br>Will be obtained prior to KRCDPP operations. | CVRWQCB<br>1685 E Street<br>Fresno, CA 93706<br>(559) 445-5116 |

### 5.6.4 Environmental Consequences

#### *5.6.4.1 Environmental Checklist*

The following Table 5.6-3. is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the California Energy

Commission (CEC) to assess the potential for significant impact to agriculture lands and soil resources.

| Table 5.6.3<br>CEQA Environmental Checklist – Agriculture and Soils<br>KRCDPP | | | | |
|---|---|---|---|---|
| **Agriculture and Soils – Would the Project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| 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? | | | | X |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | | | | X |
| 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? | | | | X |
| d) Result in substantial soil erosion or the loss of topsoil? | | | | X |
| e) 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? | | | | X |
| f) 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? | | | | X |

### *5.6.4.2 Impact Assessment*

The following discussion provides an assessment of the potential impacts to agriculture and soil resources associated with construction and operation of the proposed KRCDPP.

**Agriculture**

As stated above, the KRCDPP will not result in the conversion of any agricultural lands and therefore no mitigation for loss of agriculture land is proposed. There are no areas of

agricultural significance within the project site or along the associated linear facilities. No impact to agricultural resources is anticipated as a result of the KRCDPP.

**Soils**

The greatest potential impact associated with the KRCDPP is, wind and water erosion as a result of temporary disturbance associated with construction activities. However the potential for impacts is minimized by the wind/water erosion hazard classification of the soils in the area, which is rated at slight/none (see Table 5.6-1).

**Project Site and Construction Staging**

The entire 9.5 acre project site is previously disturbed and graded and soil on the KRCDPP project site consists of Ho, Hc and Hst, as previously described. During construction, the site would be permanently cleared, graded, filled and paved or covered with gravel for the project site, roadways and parking areas. The 9.5 acres north of the project site (which includes an existing 4-acre basin) would be used for temporary equipment laydown and staging and worker parking during construction, as necessary. After construction the staging area would be graded and covered with vegetation or gravel, as necessary, to minimize the potential for wind and water erosion. Based on available soil data in Table 5.6-1, the potential for wind and water erosion at the project site and construction staging area is slight/none and the permeability is low to moderate.

Changes in the physical characteristics of the soil will occur due to mechanical compaction required to provide suitable foundation support for structures associated with the KRCDPP. Mechanical compaction will increase the original density of the soil and reduce its porosity and permeability (MID, 2003).

The overall potential for soil loss from water erosion is minimal since proposed activities would occur within previously developed and disturbed area. In addition, all construction activities will employ mitigation and sedimentation/erosion control measures consistent with construction BMPs, as described below, to minimize the potential for wind and water erosion. Also, due to the relatively flat nature of the project site and the soil types, problems with offsite movement are not anticipated.

In addition, a portion of the project site will also be graded and paved, which will reduce surface infiltration and increase surface runoff. Surface runoff will be directed to the existing storm water basin located just north of the project site. Measures to minimize the potential from impacts associated with surface runoff will be addressed in the KRCDPP Construction SWPPP (Appendix 5.3-3).

### Linear Facilities

As previously described in this section the KRCDPP includes an approximately three-quarters of a mile overhead transmission line. Soil along the route includes Es, Hc and Hsy. These soils all have moderately low permeability and a slight to no water and wind erosion hazard. Once leaving the project site and construction staging area, the proposed line follows existing paved road rights-of-way. Temporary disturbances will occur in bare soil areas immediately surrounding each pole location during construction. After installation, the ground surface surrounding each pole will be restored to its original condition and any excess soil will be removed to prevent subsequent erosion and sedimentation. Any poles constructed at otherwise developed pole locations or in paved areas will also be restored to its original condition. No significant impacts to soil resources have been identified associated with the construction of the transmission line due to the low potential for water and wind erosion and since much of the route would be constructed within existing road right-of-ways.

The interconnections for natural gas, water and sewer will connect directly to PG&E and the MCWD, respectively. This interconnection will proceed from the project site, across the temporary staging area and along existing roadways. Soils along these routes are the same as those identified on the project site and staging area and along the transmission line right-of-way. These soils all have moderately low permeability and a slight to no water and wind erosion hazard. Area disturbed for pipeline installation will be returned to its original condition and compacted as necessary to prevent surface settling. Much of the proposed routes will occur within existing road right-of-way. No significant impacts have been identified associated with the construction of these interconnections.

### Operation

The operation of the proposed KRCDPP will not result in any significant impacts to soil resources. Site access for routine O&M of the KRCDPP will be from the existing access road located along North Avenue. All access roads and parking areas will be paved and remaining areas will be covered with crushed rock or will be landscaped with plants or trees, as necessary. Measures to minimize the potential from impacts associated with surface runoff will also be addressed in the KRCDPP Industrial SWPPP, which will be prepared prior to operation.

There is the potential that emissions from the proposed KRCDPP, principally the nitrous oxide (NOx) from the combustion turbines or the drift from the cooling towers would have an adverse impact on soil-vegetation systems in the project area. This is particularly a concern where environments that are highly sensitive are located nearby. There are no highly sensitive communities located in the immediate area of the proposed KRCDPP. In

addition, the KRCDPP is a simple cycle project with cooling towers that are much smaller than those associated with larger combined cycle projects, where emissions are of a greater concern. NOx emissions and cooling tower drift from the KRCDPP will not result in a significant impact to soils.

### 5.6.5 Proposed Mitigation Measures

BMPs will be imposed during and after construction to minimize the potential for soil erosion and sedimentation associated with construction of the KRCDPP. These BMPs would be implemented to prevent erosion and sedimentation from exposed soil areas during precipitation events to minimize the potential for significant offsite soil movement. These BMPs are further described in the project's draft construction SWPPP. All construction activities will be conducted in accordance with the General Construction Permit, as previously described. Typical BMP activities will include:

1. Reseeding distressed or lost natural vegetation;
2. Grading and compacting construction areas;
3. Minimize stockpiling soil to prevent wind erosion;
4. Surfacing disturbed soils;
   a) Netting,
   b) Rip rap,
   c) Dust control,
   d) Mulches,
   e) Soil compaction, and
5. Stockpiles of soils will be stabilized and covered if left onsite for long period of time.

Permanent erosion control measures would also be addressed as part of the KRCDPP Erosion Control and Revegetation Mitigation and Monitoring Plan. This plan will be developed in conjunction with the CEC to set any applicable performance standards to monitor the effectiveness of mitigation measures. A Geotechnical Report and Soils Analysis will be completed on the project site prior to construction activities and additional mitigation will be implemented as necessary based on the results of the analysis.

### 5.6.6 Cumulative Impacts

The current County of Fresno General Plan designates the site and vicinity for Industrial purposes, which is consistent with the proposed KRCDPP. Without the KRCDPP, the site would continue to be used for Industrial purposes in accordance with its current zoning. The KRCDPP would not involve conversion of any agricultural resources. The potential

for cumulative impacts to agricultural and soil resources is considered to be less then significant for the proposed KRCDPP.

### 5.6.7 References


Airphoto USA, 2002. Aerial Photograph flown by Airphoto USA, 2002.

California Department of Conservation, 2003. Farmland of Local Importance [web page] June 04, 2003;

City of Fresno, 2002. 2025 Fresno General Plan and related Draft Environmental Impact Report NO. 10130. Prepared by Planning and Development Advance Planning. February 1, 2002

County of Fresno, 2000a. *Fresno County General Plan Public Draft.* Sacramento, California. February 2000.

County of Fresno, 2000b. *Fresno County General Plan Background Report*. Fresno, California. October 2000.

County of Fresno, 2000c. Fresno County General Plan Policy Document. General Plan Update. October 3, 2000.

Environmental Science Associates, 2003. Proposed Malaga City Incorporation, Draft Program Environmental Impact Report. June 13, 2003.

First American Real Estate Solutions, L.P., 2003. Metroscan for Windows v3.0. Santa Ana, California

GWF, 2000. Application for a Small Power Plant Exemption. Prepared by GWF Power Systems. May 2000.

http://www.consrv.ca.gov/DLRP/fmmp/pubs/Local_definitions_00.pdf [accessed June 19, 2003].

http://www.hydro.unr.edu/homepages/benson/classes/hydro/uscs.html

Laumer, Bud, 2003. Fresno County Planning Department, Fresno, CA. Personal Communication. July 8, 2003.

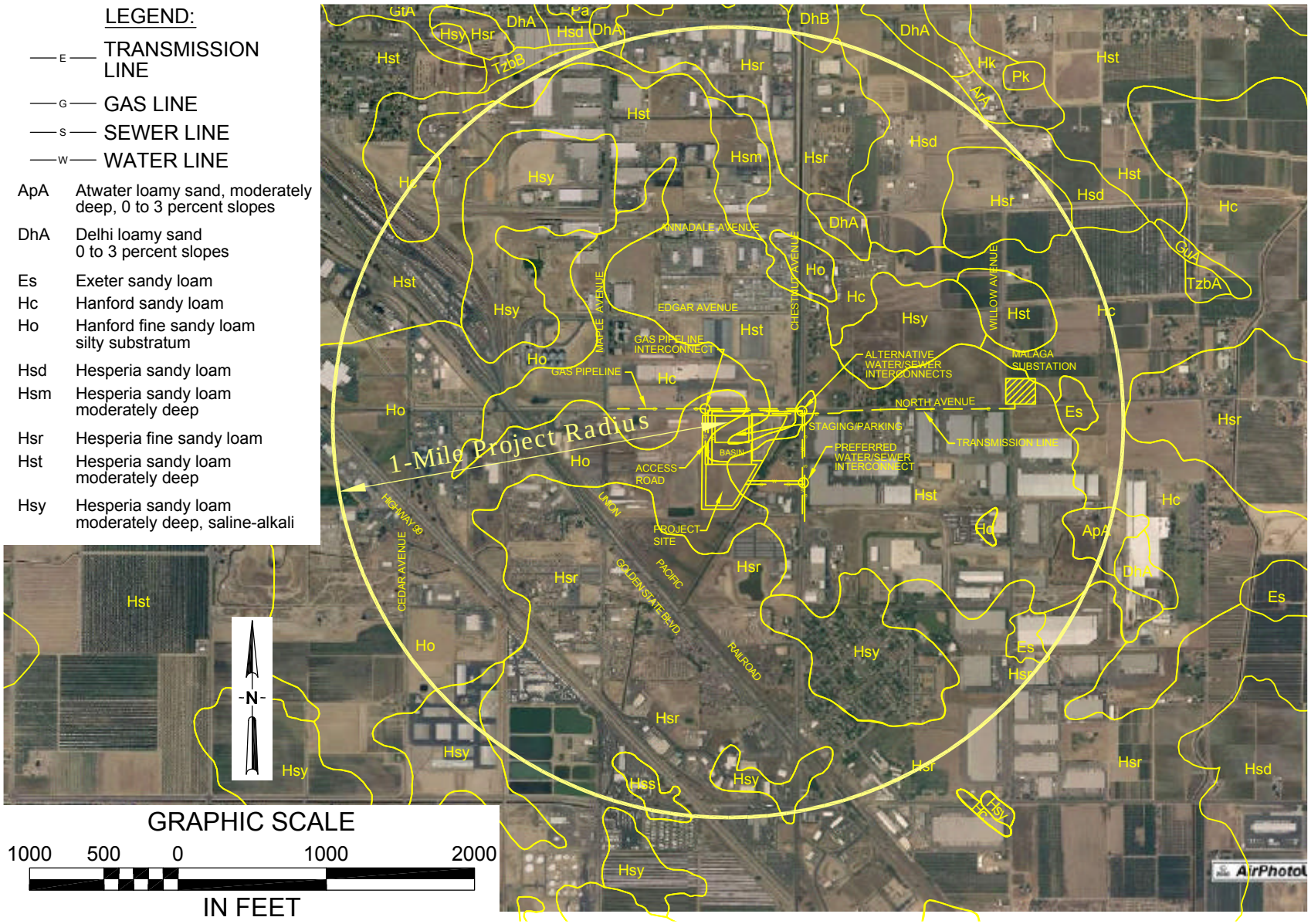
Modesto Irrigation District, 2003. Administrative Draft Application for a Small Power Plant Exemption. Prepared by CH2M Hill for Modesto Irrigation District. April 14, 2003.

Professional Service Industries, Inc., 2003. *Phase 1, Environmental Site Assessment*. Long Beach, California. May 6, 2003.

The USDA, Natural Resources Conservation Service's National Engineering Handbook, Section 3, 1983. Available at: http://www.nrcs.usda.gov/technical/eng/neh.html.

United States Department of Agriculture (USDA), 1971. Soil Survey, Eastern Fresno Area. (pg 81-84;pg 163-164).

S:\Design Engineering\Projects\116289\40620\FIGURE 5.6-1.dwg, 11/21/2003 02:13:22 PM




KRCD
Kings River Conservation District

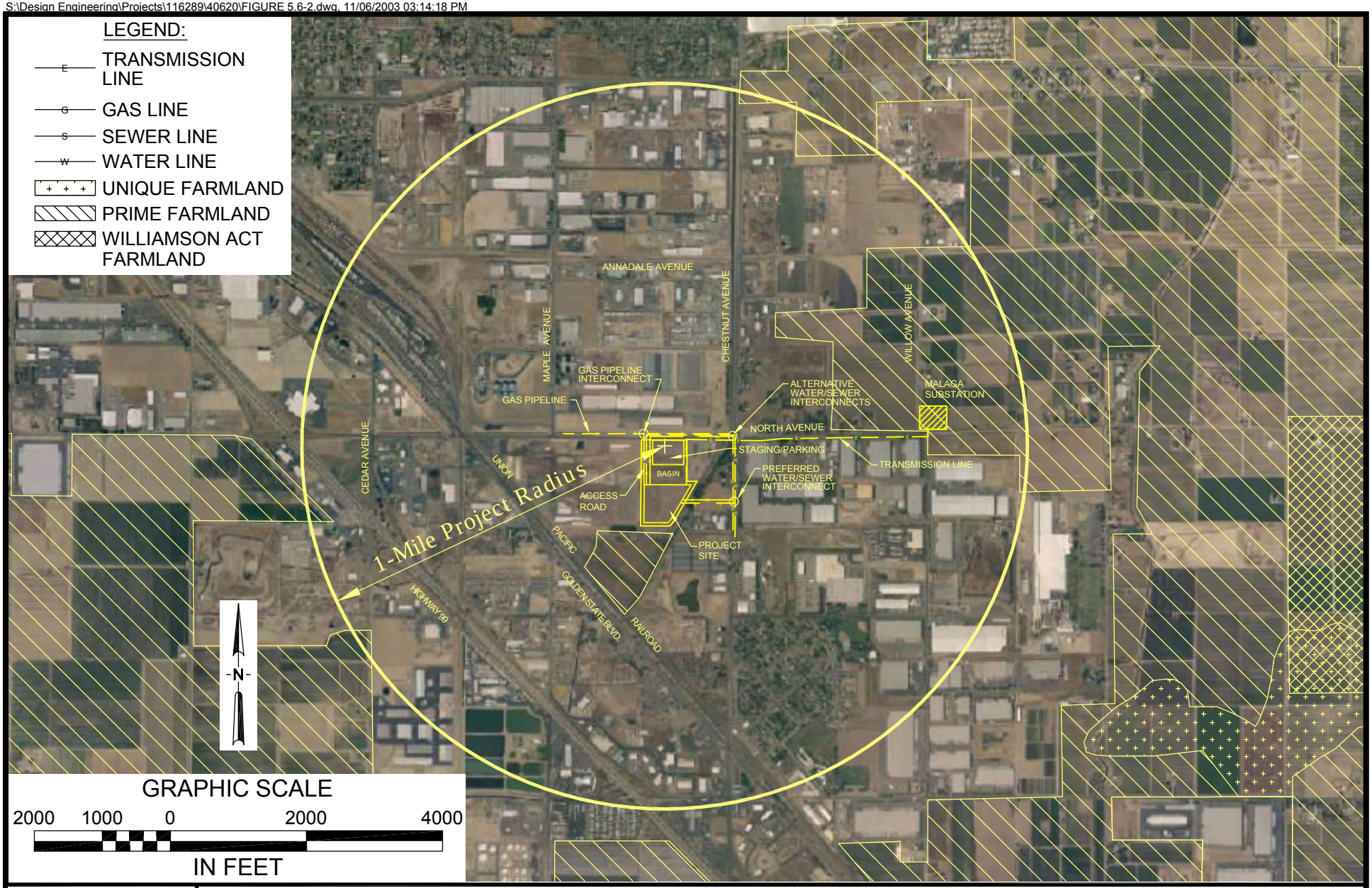
# FIGURE 5.6-1

Soil Map of the
KRCDPP Project Area

KRCDPP

09/30/03 REV. 0

S:\Design Engineering\Projects\116289\40620\FIGURE 5.6-2.dwg, 11/06/2003 03:14:18 PM




KRCD
Kings River Conservation District

FIGURE 5.6-2

Farmland In The
KRCDPP Project Area

KRCDPP

09/30/03 REV. 0

# SECTION 5.7 TRAFFIC AND TRANSPORTATION

## 5.7.1 Introduction

This section analyzes existing conditions in the area of the proposed Kings River Conservation District Peaking Plant (KRCDPP) and the potential impacts of KRCDPP construction and operation and maintenance (O&M) activities on the existing local transportation system. A description of the existing transportation system and levels of service (LOS) are presented, along with an analysis of potential impacts associated with the KRCDPP.

## 5.7.2 Affected Environment

### *5.7.2.1 Regional Setting*

The proposed KRCDPP would be located in Fresno County in the center of the San Joaquin Valley, which stretches approximately 100 miles from the Coast Range foothills to the eastern slope of the Sierra Nevada. Fresno County contains a relatively complex highway transportation system designed to serve cars, heavy trucks, agricultural and commercial vehicles, buses, transit, bicycles and pedestrian traffic (Fresno County, 2000a).

State Route (SR) 99 is the primary north/south travel route in the area. SR99 is also one of the state's primary routes for interregional and interstate business, freight, tourist and recreational travel, connecting most cities of the San Joaquin Valley to Sacramento and Southern California (ESA, 2003). SR99 is a 4 to 6 lane freeway that runs through the western side of the City of Fresno. For the proposed KRCDPP, access to and from SR99 is via the North Avenue interchange. The recently completed Chestnut Avenue overcrossing at Golden State Boulevard also provides an alternate access route to and from SR99 to the south.

Table 5.7-1 identifies the annual average daily traffic (AADT), annual average peak hour traffic, annual average daily truck traffic and percent of truck traffic for SR99. These traffic estimates are presented for various mileposts or junctions with regional and local roadways in the general vicinity of the proposed KRCDPP. Table 5.7-1 also contains LOS data for segments of SR99 near the KRCDPP. LOS is a qualitative measurement of operational characteristics of traffic flow on a roadway or at the intersection of roadways. LOS measurements represent the flow of traffic ranging from LOS A (free-flowing traffic) to LOS F (heavily congested with stoppage of traffic flow) (Transportation Research Board, 2000). Descriptions of potential LOS for intersections and freeway segments are summarized in Table 5.7-2.

LOS criteria for highways are established by the California Department of Transportation (Caltrans) and take into account numerous variables such as AADT, capacity, grade, environment (urban or rural), and other relevant considerations. According to Caltrans policy, LOS D is acceptable for planning purposes. Fresno County has not adopted a comprehensive LOS standard; however, it is a well-established county practice to maintain LOS C (see Table 5.7-2) on local roadways as a goal for development mitigation, and as a threshold for county capacity-enhancing roadway projects. The cities of Fresno and Clovis have a LOS D standard for their roadway systems (County of Fresno, 2000a). Currently, all portions of SR99 potentially affected by the proposed KRCDPP are operating at or above LOS D (Liu, 2003).

**Table 5.7-1**
**Current Traffic Characteristics for SR99**
**KRCDPP**

| Highway/ Milepost | Location | AADT[a] | Annual Average Peak Hour Traffic[a] | Annual Average Daily Truck Traffic[b] | Percent of Truck Traffic[b] |
|---|---|---|---|---|---|
| 15.49 | Chestnut Avenue | 85,000 | 8,500 | 14,720 | 23% |
| 15.86 | Central Avenue | 86,000 | 8,600 | N/A | N/A |
| 16.93 | Cedar Avenue | 86,000 | 8,600 | N/A | N/A |
| 17.26 | North Avenue | 87,000 | 8,700 | N/A | N/A |
| 18.54 | Jensen Avenue | 98,000 | 9,800 | N/A | N/A |
| 19.29 | Junction Route 41 | 61,000 | 7,300 | N/A | N/A |
| 20.19 | Junction Route 180, Ventura Street | 73,000 | 8,800 | N/A | N/A |

**LOS**

| Segment of SR99 | Actual LOS[b] | LOS Standard[b] |
|---|---|---|
| Central Avenue to Chestnut Avenue/Chestnut Avenue to Central Avenue | C/D | D |
| Cedar Avenue to Central Avenue/Central Avenue to Cedar Avenue | D/D | D |
| North Avenue to Cedar Avenue/Cedar Avenue to North Avenue | D/D | D |
| Jensen Avenue to North Avenue/North Avenue to Jensen Avenue | D/D | D |
| Junction Route 41 to Jensen Avenue /Jensen Avenue to Junction Route 41 | C/D | D |
| Ventura Avenue to Junction Route 41/Junction Route 41 to Ventura Avenue | C/C | D |

**Table 5.7-1**
**Current Traffic Characteristics for SR99**
**KRCDPP**

| Highway/ Milepost | Location | AADT[a] | Annual Average Peak Hour Traffic[a] | Annual Average Daily Truck Traffic[b] | Percent of Truck Traffic[b] |
|---|---|---|---|---|---|

[a] Caltrans, http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2002all/r099i.htm
[b]Caltrans Traffic Engineering and Operations (Liu, John), 2003.
N/A: not available.

**Table 5.7-2**
**Descriptions of LOS for Intersections and Roadways**
**KRCDPP**

| LOS | Signalized Intersection | Unsignalized Intersection | Freeway or Roadway Segment |
|---|---|---|---|
| A | Uncongested operations, all queues clear in a single signal cycle. V/C < 0.60 | Little or no delay (<5 seconds) | Completely free flow. |
| B | Uncongested operations, all queues clear in a single cycle. V/C ≥0.60<0.70 | Short traffic delays (≥5 - <10 seconds) | Free flow, presence of other vehicles noticeable. |
| C | Light congestion, occasional backups on critical approaches. V/C ≥0.70<0.80 | Average traffic delays (≥10 - < 20 seconds) | Ability to maneuver and select operating speed affected. |
| D | Significant congestion on critical approaches, but intersection is functional. Cars required to wait through more than one cycle during short peaks. No ling queues formed. V/C ≥0.80<0.90 | Long traffic delays (≥20 - < 30 seconds) | Unstable flow, speeds and ability to maneuver are severely affected. |
| E | Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turn movements. Traffic queues may block nearby intersection(s) upstream of critical approach(s). V/C≥0.90<1.00 | Very long traffic delays (≥30 - < 45 seconds) | At or near capacity, flow appears quite unstable. |
| F | Total breakdown, stop-and-go operation. V/C ≥1.00 | Intersection blocked by external causes (≥ 45 seconds) | Forced flow, breakdown. |

Source: Transportation Research Board, 1981, 1985, 1994
Acronyms:
V/C – volume/capacity

Other highways located in Fresno County and that serve the general project area include Highways 41, 168 and 180.

### *5.7.2.2 Project Area Setting*

The proposed KRCDPP will consist of an approximately 97 megawatt (MW) natural gas-fired peaking power plant to be located south of the City of Fresno and near the Community of Malaga, in Fresno County, California. The proposed project site is located south of North Avenue, west of Chestnut Avenue, and is situated on the west side of the Central Canal, which is owned and operated by the Fresno Irrigation District (FID). Kings River Conservation District (KRCD) currently has an option to purchase approximately 19 acres of land and the KRCDPP site would consist of the southern 9.5 acres of the property. The northern 9.5 acres would be used for temporary construction staging and parking areas during construction. An existing 4-acre storm water basin is also located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along

Chestnut Avenue. Currently, the KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Domestic wastewater will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph.

The project site and general project area are zoned industrial. General land uses in the area include industrial with a small number of residences located both east of the project site and along the proposed transmission line route. Additional information on land uses in the project area is included in Section 5.5, Land Use. The proposed KRCDPP is compatible with existing land uses.

**Public Transportation**

A variety of public and privately owned services provide transit services in the area of the proposed KRCDPP. Within the Fresno-Clovis Metropolitan Area, Fresno Area Express provides fixed-route transit service. Handy Ride provides demand-responsive service primarily for elderly and disabled persons. Privately owned ground transportation service providers with regional linkages include Amtrak, and Greyhound bus service.

**Bicycle Facilities**

There are no bicycle facilities or bikeways in the area of the proposed KRCDPP. Bikeways along Golden State Boulevard and Jensen Avenue (generally west and north of the project area) are planned but have not been implemented (Gorman, 2003). Bicyclists share the roadways with motorists throughout the area of the proposed KRCDPP.

**Railroad Operations**

The KRCDPP project site is located near the Union Pacific railroad. The main line runs parallel to Golden State Boulevard, as shown on Figure 5.7-1. Spur tracks are located both south of the KRCDPP project site and east of the project site and throughout the project area. The rail spurs are not necessary for construction and O&M of the proposed KRCDPP, but may be utilized as appropriate for deliveries to the site.

**Airports**

There are nine public and private airports within Fresno County, including six public airports and three private airports. Federal Aviation Regulations, Part 77, establishes standards for determining obstructions in navigable air space and sets forth notification requirements when there is a change in land use that would involve the development of any structures over 200 feet above ground level. Notification is also required if the obstruction is less than the specified height and is located within restricted air space in the approach to airports. No features associated with the KRCDPP will be above 200 feet in height.

The Fresno Chandler Downtown Airport is located 5.5 miles from the proposed KRCDPP and the Fresno-Yosemite International Airport is located approximately 10 miles from the proposed KRCDPP. No feature associated with the proposed KRCDPP will be located within restricted airport space and therefore no notification is required.

**School/School Bus Routes**

The school closest to the KRCDPP is Malaga Elementary School, which is located approximately .62 miles from the project site at 3910 South Ward Avenue. School bus routes for the Malaga School run along Chestnut Avenue with three stops immediately south of North Avenue on the west side. There are no school bus stops on North Avenue west of Chestnut Avenue but there are numerous bus stops on North Avenue east of Chestnut Avenue. It is anticipated that the majority of construction related traffic would follow North Avenue from SR99, therefore limiting the potential to impact bus routes in the project vicinity.

### *5.7.2.3 Local Roadways in Project Area*

The major access to the KRCDPP project site would be from North Avenue. North Avenue is a two-lane arterial roadway with a rural character that generally runs east to west (ESA, 2003). In the project vicinity it includes a 12-foot lane, 3 to 4-foot paved shoulder, and additional graded shoulder width in each direction. Other roads near the proposed KRCDPP that would likely be accessed during construction and O&M activities include Golden State Boulevard (north of Central Avenue) and Chestnut

Avenue. Both are classified as arterials with Golden State Boulevard becoming a super arterial south of Central Avenue. Chestnut Avenue, which will serve as the primary link between North Avenue and SR99 to the south, is typically fully improved to expressway status north of SR99 with two lanes and 8-foot paved shoulders in each direction separated by a 20-foot raised median. The intersection of North Avenue with Chestnut Avenue is controlled with traffic signals. The intersections of the SR99 ramp junctures with both North and Chestnut Avenues and Cedar Avenue with North Avenue are controlled with stop signs. South Maple Avenue is classified as a collector roadway. Other roadways in the project vicinity include Annandale Avenue and Edgar Avenue, which are simply classified as local streets. Roadway classifications and their definitions are provided in Table 5.7-3. Major roadways in the KRCDPP project area are shown on Figure 5.7-1.

**Table 5.7-3**
**General Roadway Classifications and Definitions**
**KRCDPP**

| | |
|---|---|
| Freeway | Multiple-lane divided roadways servicing through and cross-town traffic, with no access to abutting property and no at-grade intersections. |
| Expressway | Four- to six-lane divided roadways primarily servicing through and cross-town traffic, with no direct access to abutting property and at-grade intersections located at approximately half-mile intervals. |
| Super Arterials | Four- to six-lane divided roadways with a primary purpose of moving traffic to and from major traffic generators and between community plan areas. |
| Arterials | Four- to six-lane divided roadways, with somewhat limited access to abutting properties, and with the primary purpose of moving traffic between community plan areas and to and from freeways and expressways. |
| Collectors | Two- to four-lane undivided roadways, with the primary function of connecting local streets and arterials and neighborhood traffic generators and providing access to abutting properties. |
| Local Streets | Two- to three-lane public or private roadways designed to provide direct access to properties while discouraging through traffic. |
| Source: City of Fresno, 2002 | |

### *5.7.2.4 Level of Service/Traffic Characteristics*

A summary of the description of the local roadways that would likely provide access to the proposed KRCDPP is provided below in Table 5.7-4. Table 5.7-4 identifies the roadway classification, average daily traffic volume, and existing LOS, as available, for each roadway. Figure 5.6-2 shows the average daily traffic volumes on the major roads and highways in the area of the proposed KRCDPP.

| Table 5.7-4<br>Traffic Characteristics of Local Roadways and Intersections in the Project Area<br>KRCDPP | | | | | |
|---|---|---|---|---|---|
| **Roadway Segment or Intersection** | **Roadway Classification or Intersection Type of Traffic Control[a]** | **PM Peak Hour Traffic Volume/Count Location[b]** | **Approximate Roadway Capacity** | **V/C Ratio** | **Existing LOS** |
| North Avenue (Roadway Segment) | Arterial | 300 (between Cedar and Chestnut) | 1,200 | 0.25 | A |
| Cedar Avenue (Roadway Segment | Arterial | 60 (between SR99 and North Avenue) | 1,200 | 0.05 | A |
| Chestnut Avenue (Roadway Segment | Arterial | 340 (south of North Avenue | 3,600 | 0.1 | A |
| North/Chestnut (Intersection) | N/A | N/A | | 0.38 | A |
| North/Cedar (Intersection | N/A | N/A | | | B |

[a] ESA, 2003
[b] Wilson Engineering & Transportation Consultants, Inc., 2003

A review of Table 5.7-4 indicates roadways within the project area currently operate well during the evening peak or commute hour. Roadway segments generally operate at an LOS A, or best possible condition, with very limited levels of congestion. Similarly, the nearby intersections of North Avenue with both Cedar and Chestnut Avenue operate well also.

### 5.7.3 Laws, Ordinances, Regulations, and Standards

The federal, state, and local laws, ordinances, regulations and standards (LORS) that are applicable to the proposed KRCDPP are presented below in Table 5.7-5. The KRCDPP will not cause any impacts to traffic or transportation that are inconsistent with federal, state or local LORS.

| Table 5.7-5<br>Traffic and Transportation LORS<br>KRCDPP | | |
|---|---|---|
| **Regulatory Authority/** | **Applicable LORS** | **Requirement/Compliance** |
| **Federal** | | |
| U.S. Department of Transportation-Administered by Caltrans | Hazardous Materials Transportation Act of 1974; 49 Code of Federal Regulations (CFR) 397.9 | Directs the Federal Department of Transportation to establish criteria and regulation for the safe interstate transportation of hazardous materials. |
| | 49 CFR Chapter II; Subchapter C | Contains standards for the transportation of hazardous materials. Requires proper handling and storage of hazardous materials during transportation. |
| | 49 CFR Chapter III; Subchapter B, Parts 171-173; 177-178 | Contains national safety standards for the transport of goods, materials and substances over public highways. Requires proper handling and storage of hazardous materials during transportation. |
| Federal Aviation Administration | Regulations, Part 77 | Establishes standards for determining obstructions in navigable air space and sets forth notification requirements when there is a change in land use that would involve the development of any structures over 200 feet above ground level. Notification is also required if the obstruction is less than the specified height and is located within restricted air space in the approach to airports.<br><br>No features associated with the KRCDPP will be above 200 feet in height or located within restricted airspace and no notification is required. |
| **State** | | |
| Caltrans | California Vehicle Code Section 35780; California Streets and Highways Code, Sections 660-711; 21 CCR 1411.1-1411.6 | Requires permits for any load exceeding Caltrans weight, length, or width standards for public roadways. |
| | California Streets and Highways Code, Sections 117-660-711 | Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery. |
| | California Vehicle Code Section 31300, 31303 et seq. | Requires that the transportation of hazardous materials be on state or interstate highways that offer the shortest overall transit time possible. |

| Table 5.7-5<br>Traffic and Transportation LORS<br>KRCDPP | | |
|---|---|---|
| **Regulatory Authority/** | **Applicable LORS** | **Requirement/Compliance** |
| | California Vehicle Code Section 32105 | Requires shippers of inhalation hazard or explosive materials must the California Highway Patrol to apply for a Hazardous Material Transportation License and obtain routes approved for material shipping. |
| **Local** | | |
| Fresno County | Transportation and Circulation Element of Fresno County General Plan | Specifies long-term planning goals and procedures for transportation infrastructure system quality in County of Fresno. |
| | Rural Bikeways Plan | Provides for a proposed roadway-related bikeway system in the unincorporated portions of Fresno County. |
| City of Fresno | Transportation/Streets and Highways Element of Fresno General Plan | Specifies long-term planning goals and procedures for transportation infrastructure system quality in City of Fresno. |
| Council of Fresno County Governments | Regional Transportation Plan | Provides transportation system coordination for cities and unincorporated areas of Fresno County. |
| | Regional Bikeways Plan | Provides bikeway connectivity between cities and unincorporated areas providing access to recreational areas, regional parks, and recreational bicycling routes. |

### *5.7.3.1 Required Permits and Agency Contacts*

Traffic and transportation permits that will likely be required for the proposed KRCDPP and the estimated time required in obtaining them are summarized in Table 5.7-6.

| Table 5.7-6<br>Traffic and Transportation Permit Schedule<br>KRCDPP | |
|---|---|
| **Permit** | **Schedule** |
| Caltrans permit for transport of oversized loads over state highways | Obtain as required; approximately 2 hour processing time for single trip, approximately 2 week processing time for annual trip. |
| Caltrans transportation permit for oversized vehicles | Obtain as required; same day processing. |

| Table 5.7-6<br>Traffic and Transportation Permit Schedule<br>KRCDPP | |
|---|---|
| **Permit** | **Schedule** |
| City of Fresno transportation permit for oversized vehicles or excessive loads (section of North Avenue under City jurisdiction) | Obtain as required; typically same day processing. |
| Fresno County transportation permit for oversized vehicles or excessive loads | Obtain as required; typically same day processing. |
| California Highway Patrol (CHP) Hazardous Material Transportation License | Obtain as required; same day processing. |

Table 5.7-7 provides a list of local agencies involved in traffic and transportation management for the proposed KRCDPP.

| Table 5.7-7<br>Traffic and Transportation Agency Contacts<br>KRCDPP | |
|---|---|
| **Agency Name** | **Phone Number** |
| Fresno County Department of Public Works and Planning | (559) 262-4078 |
| City of Fresno Traffic Engineering Department | (559) 621-8650 |
| Caltrans | (916) 323-0186 (Single trip permits)<br>(916) 327-8741 (Annual permits) |
| CHP | (559) 445-6992 |

### 5.7.4 Environmental Consequences

#### *5.7.4.1 Environmental Checklist*

Table 5.7-8 is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the California Energy Commission (CEC) to assess the potential for significant impact to traffic and transportation.

| Table 5.7-8<br>CEQA Environmental Checklist –Traffic and Transportation<br>KRCDPP | | | | |
|---|---|---|---|---|
| **Traffic and Transportation – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street | | | | |

| Table 5.7-8<br>CEQA Environmental Checklist –Traffic and Transportation<br>KRCDPP | | | | |
|---|---|---|---|---|
| **Traffic and Transportation – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| 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)? | | | | X |
| b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? | | | | X |
| 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? | | | | X |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | | | | X |
| e) Result in inadequate emergency access? | | | | X |
| f) Result in inadequate parking capacity? | | | | X |
| g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | | | | X |

### 5.7.5 Impact Assessment

#### *5.7.5.1 Construction Phase*

The following methods and assumptions were used to determine impacts associated with construction of the proposed KRCDPP and associated linear facilities, as previously described.

### Construction Workforce and Access

Construction of the KRCDPP, including the associated linear facilities, identified above, will take approximately 6 months. It is anticipated that the construction workers required to build the KRCDPP will be drawn from the local labor pool of the Community of Malaga, Fresno County, and the surrounding counties and regions, as discussed further in Section 5.12, Socioeconomics. The KRCDPP will require an average construction workforce over the 6-month construction period of 68 workers per month and 101 workers at peak construction during month 5. Workforce vehicle trips associated with construction were calculated based upon these assumptions.

The average daily workforce for the KRCDPP and the associated linear facilities is assumed to be 68 workers and it is assumed that 20 percent, or 13 workers will carpool with other workers. This creates a total of 55 one-way trips to the KRCDPP or 110 round trips per day on average and an estimated 162 trips per day during peak periods (also assuming a 20 percent car pool rate).

Access to the project site will be from North Avenue. An access road would be constructed across the northern 9.5 acres and provide access to the project site from North Avenue, as shown on Figure 5.7-1. The proposed route for access to the project site for construction traffic (both construction workers and truck traffic) will be from SR99 to North Avenue. Traffic to and from the north on SR99 will follow North Avenue directly east to the site from the North Avenue/ SR99 interchange. Traffic to and from the south on SR99 should be expected to follow Chestnut Avenue north from the Chestnut Avenue ramps to and from SR99 to North Avenue and then North Avenue westerly to the site. As the primary access links to the site, both North and Chestnut Avenues will experience the greatest volume of construction traffic associated with the KRCDPP. However, as indicated in Table 5.7-4 both roadways and the adjacent intersections of North Avenue with Cedar and Chestnut Avenues have more than sufficient capacity to accommodate any temporary increases in traffic associated with project construction. Furthermore, the recently completed Chestnut Avenue overcrossing at Golden State Boulevard provides an alternate access route to and from SR99 thus reducing the potential for traffic congestion at SR99 ramp junctures.

As shown on Figure 5.7-1, parking for construction personnel will be provided on the northern portion of the 9.5 acre parcel adjacent to the project site to the north (i.e. north of the 4-acre basin). This area will also be used for a temporary construction staging and laydown area during construction. There is sufficient parking for all workers and for the duration of construction activities.

Construction workforce traffic will generally occur between 6:30 am and 8 am and between 3:30 PM and 5:30 PM, Monday through Friday. During the peak construction period (estimated to occur in month 5 of construction), construction-related traffic in the area would increase by 162 rounds trips per day. This correlates to increases in average daily traffic volumes of approximately 5 percent on Chestnut Avenue between North Avenue and SR99 and 3.5 percent on North Avenue between SR99 and the project site, the roads most likely affected during construction of the proposed KRCDPP and linear facilities. Construction related traffic would increase on SR99 by approximately two tenths of a percent. Even with the addition of the peak construction workforce, traffic associated with construction of the KRCDPP would not lower the existing LOS of these local or state roadways. Again, as indicated in Table 5.7-4 both Chestnut and North Avenues and the adjacent intersections of North Avenue with Cedar and Chestnut Avenues have more than sufficient capacity to accommodate any temporary increases in traffic associated with construction of the KRCDPP. The additional construction traffic may contribute to temporary minor delays on North Avenue near the proposed KRCDPP entrance. However, these will be minor. Construction-related increases in traffic will be short-term, occurring mostly during the peak construction period, which is assumed to be month 5 of construction. The temporary and limited nature of these potential construction-related impacts will keep any impacts to traffic and transportation at a less than significant level.

**Construction Equipment and Material Deliveries**

Construction of the proposed KRCDPP will require the use and installation of heavy equipment and associated systems that would need to be delivered to the site by truck. The truck route for the heavy equipment is generally from SR99 to North Avenue and then south along the access road to the KRCDPP project site. As described previously in Section 5.7.3, and in accordance with California Vehicle Code Section 35780, transportation permits from Caltrans will be required for any load exceeding specified weight, length, or width standards for public roadways.

The LM6000 generators and equipment are currently being stored in two of the abandoned cottonseed storage barns located near the center of a vacant 60-acre parcel adjacent to the project site on the west. The equipment will be transported via truck and across the 60-acre parcel to the KRCDPP project site.

Construction debris and small quantities of hazardous materials will be generated during construction and will need to be hauled away for disposal, as described in Section 5.10, Hazardous Material and Waste Management. The transportation of hazardous materials will be in accordance with California Vehicle Code Section 31300, as described

previously in Section 5.7.3. The number of trucks required during construction of the KRCDPP and associated linear facilities is estimated to be 5 trucks daily with a conservative "worst case" of approximately 15 trucks per day. Truck deliveries to the KRCDPP site are expected to occur at all hours of the day; however deliveries will limited to offpeak hours (ie. from 9 am to 3 pm), to the extent feasible.

**Construction of Linear Facilities**

The linear facilities associated with the KRCDPP will be constructed primarily along existing road rights of way and primarily along North and Chestnut Avenues. The proposed electric transmission line would involve replacement of a portion of the existing PG&E distribution line along North Avenue with new taller wooden poles to connect the KRCDPP into PG&E's Malaga Substation. Impacts during the construction of the transmission line will occur outside of the travel lanes and is not expected to significantly impact traffic along North Avenue or Willow Avenue. The transmission line will be constructed, owned and operated by PG&E and will be constructed in accordance with applicable PG&E standards.

The water and sewer interconnections for the KRCDPP will connect into the existing MCWD system located along Chestnut Avenue through interconnections either at the intersection of North and Chestnut Avenues or along Chestnut Avenue east of the project site, as previously described. Both interconnections will involve boring under the Central Canal and the Union Pacific Railroad, which parallels the Central Canal. The preferred routing would involve crossing a vacant parcel located east of the project site and the area would either be accessed from either the project site or from Chestnut Avenue. The alternative route would be constructed along the south side of North Avenue and interconnect at the intersection of North and Chestnut Avenues. Minimal traffic impacts are expected with either routing.

The gas pipeline would proceed north from the project site and interconnect to PG&E system at North Avenue. Minimal traffic impacts are expected with pipeline construction.

Any damage to existing roads associated with construction activities will be repaired or restored to its original condition or as near as possible to its original condition. Additional detail on access, construction staging and construction will be included in the traffic control plan(s) that will be prepared prior to construction.

### *5.7.5.2 Operation and Maintenance of the KRCDPP*

Operation of the proposed KRCDPP would require a 3 full time personnel. Due to the small number of workers required for routine O&M, only a minimal number of additional

vehicle trips per day will be generated by the proposed KRCDPP. There would be no change in the LOS along existing roadways. Routine O&M of the KRCDPP would not have a significant impact on traffic and the local transportation system.

**Delivery and Removal of Hazardous Wastes**

A minimal number of hazardous materials deliveries will be made to the KRCDPP during operation. The anticipated travel routes for hazardous materials delivery will be along SR99 and North Avenue. The trucks will then proceed from North Avenue along the access road to the KRCDPP project site.

As described in Chapter 2, Project and Facility Description, the KRCDPP project site will include aqueous ammonia for controlling NOx emissions. Aqueous ammonia deliveries are anticipated to occur every 2 weeks during KRCDPP peak operations.

If a onsite ZLD technology is selected, the following chemicals will be delivered on a monthly basis: sulfuric acid, sodium hydroxide, calcium chloride, scale/corrosion inhibitor and sodium bromide. Wastes from the ZLD system will be trucked from the site on a weekly basis. The delivery and waste removal schedules assume that the KRCDPP is operating at peak conditions. Other chemicals including anti-foams, anti-scalants, sodium bisulfate as well as laboratory supplies will be delivered on an as needed basis, which is expected to 2-4 times per year. Some deliveries will be combined into one shipment.

If the offsite ZLD technology is selected the following chemicals will be delivered on 1-2 times per year: calcium hypochlorite, sodium molybdenate as well as laboratory supplies. This system will require the replacement of the treatment trailers on an as needed basis which is expected to be three times per week during peak operations.

As previously discussed in Section 5.6.3 and according to Division 13 Section 31303 of the California Vehicle Code, the transportation of hazardous materials will be on the state or interstate highways that offer the shortest overall transit time possible. Division 14.3 Section 32105 of the Vehicle Code specifies that unless there is not an alternative route, every driver of a vehicle transporting inhalation hazards shall avoid, by pre-arrangement of routes, driving into or through heavily populated areas, congested thoroughfares, or places where crowds are assembled.

Transporters of inhalation hazards or explosive materials must contact the CHP and apply for a Hazardous Material Transportation License. Upon receiving this license, the shipper will obtain a handbook, which will specify the routes approved to ship inhalation

hazardous or explosive materials. Operating convenience is not a consideration. The exact route of the inhalation or explosive material shipment will not be determined until the shipper contacts the CHP and applies for a license. The proposed route for transporting aqueous ammonia to the KRCDPP project site is from SR99 to North Avenue and from North Avenue south along the access road to the KRCDPP.

The wastes generated as a result of KRCDPP operations will be tested to determine whether they are hazardous or non-hazardous and properly disposed of, as discussed further in Section 5.10, Hazardous Material and Waste Management.

Overall, the number of truck trips to deliver and remove hazardous and non-hazardous materials from the KRCDPP during operations will be minimal and will not change the existing LOS of applicable roadways. There will be no significant impacts to local roadways as a result of truck traffic associated with ongoing O&M of the KRCDPP.

Facility operation is not anticipated to include any routine or periodic deliveries via local or regional railroads. No adverse impacts to rail services will occur.

**Visible Plumes**

The cooling towers associated with the KRCDPP may produce occasional visible plumes. However, the KRCDPP cooling towers are used for process cooling for the turbine inlet chiller units and are not used to reject heat from a steam condenser where heat rejection loads are more significant, creating larger plumes. Also, the KRCDPP cooling towers will typically be operated during warmer ambient conditions (i.e. likely greater than 60 degrees Fahrenheit), when the potential for visible plumes is reduced. The plumes from the KRCDPP cooling towers are not expected to be significant in size and are not likely to impact traffic safety on local roadways.

**Emergency Access**

Construction and O&M operation of the KRCDPP will have no significant impacts on emergency medical service response times or ratios. As described further in Section 5.12, Socioeconomics, it is not anticipated that the short-term emergency medical response capabilities required during construction or the long-term emergency medical requirements of the full-time O&M staff will noticeably affect response capabilities or times beyond existing service ratios and times.

#### *5.7.5.3 Operation and Maintenance of Linear Facilities*

Traffic associated with the operation of the KRCDPP linear facilities (i.e. transmission, water, sewer and gas interconnections) will be minimal and will be limited to

preventative maintenance vehicles or repair vehicles. The traffic generated by O&M of the linear facilities will be less than significant.

### 5.7.6 Proposed Mitigation Measures

#### *5.7.6.1 Construction Phase*

**Construction on the Project Site**

Construction of the KRCDPP will add a minimal amount of traffic to state routes and local roadways during the peak construction period and for a temporary period of time. With the existing roadway capacity operating at an adequate level, the construction related traffic associated with the KRCDPP would not result in significant impacts.

Other than temporary increase of traffic on local roadways, the construction activities on the project site will not impact traffic or local roadways. Laydown, staging and parking for the KRCDPP will occur on the parcel south of North Avenue and north of the project site. Project site construction is not occurring on or adjacent to local roadways and therefore will have no impact on these local roadways. No mitigation is proposed.

**Construction of Linear Facilities**

The duration of construction for the linear facilities associated with the KRCDPP would be approximately 1-2 months. The construction of the linear facilities associated with the KRCDPP is not expected to significantly impact traffic along local roadways. Construction activities would occur along the shoulder of the road and outside of the travel lanes. Construction staging and parking areas for the linear interconnections would occur either within the road right-of-way or on the staging area north the project site.

Mitigation of potential traffic impacts caused by construction may include such activities as stationing flag persons along the linear right-of-ways and placing advance warning flashes, flag persons, and signage along the roadways. Roadways opened during the construction of the linear lines including natural gas, water or sewer pipelines will be returned to or near to their preexisting condition.

The construction contractor(s) for the linear facilities will prepare a construction traffic control plan(s) to minimize traffic impacts associated with construction activities and to minimize impacts to local industry and residences along the route. That plan will addresses timing of heavy equipment and building material deliveries, signing, lighting, traffic control device placement, and establishing work hours outside of peak traffic periods as well as other specific measures that will be developed final design and engineering of the linear facilities.

It is currently assumed that one lane of traffic may need to be closed temporarily during construction of the KRCDPP linear facilities. In this case, flag persons will be placed at each end of the construction corridor as necessary to control in the remaining lane. Construction will be scheduled to minimize impacts on the local transportation system by schedule work during off-peak hours and placing appropriate signage of the work that is occurring and identifying any detours that are available. Access to all industrial and residential users will be maintained to the extent feasible during the short duration of construction.

#### *5.7.6.2 Operation Phase*

O&M related traffic associated with the KRCDPP and associated linear facilities is considered to be minimal. Sufficient access for O&M will be provided along existing road rights-of-way or along the access road to the project site from North Avenue. State routes and local roadways have adequate capacity to accommodate operations-related traffic. No operations-related mitigation measures are being proposed for the KRCDPP.

### 5.7.7 Cumulative Impacts

There are no planned roadway construction or expansion projects planned in the vicinity of the KRCDPP that would, in conjunction with the KRCDPP, degrade local roadways.

The 7-Year Fresno County Road Improvement Plan contains no road improvement projects in the vicinity of the project (Nakagawa, 2003). Additionally, there are no Caltrans projects planned near the project vicinity (Stites, 2003). The City of Fresno plans to widen North Avenue west of SR99 to SR41, and west of the project area but it is anticipated there will be no cumulative impact as KRCDPP traffic will travel on North Avenue east of SR99. Additionally, the recent completion of the Chestnut Avenue overcrossing at Golden State Boulevard provides an alternate access route to SR99, thus reducing the potential for traffic congestion. The regional roadways serving the KRCDPP have the available capacity to accommodate the traffic that will result from construction and O&M activities.

### 5.7.8 References

Caltrans, 2003. Website at:
http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2002all/r099i.htm

City of Fresno, 2002. 2025 Fresno General Plan and related Draft Environmental Impact Report No. 10130. Planning and Development Department Advance Planning, February 1, 2002.

County of Fresno, 2000a. *Fresno County General Plan Public Draft.* Sacramento, California. February 2000.

County of Fresno, 2000b. Final Environmental Impact Report. General Plan Update. August 2000.

County of Fresno, 2000c. *Fresno County General Plan Background Report*. Fresno, California. October 2000.

County of Fresno, 2000d. Fresno County General Plan Transportation and Circulation Element. Fresno, California. October 2000.

Environmental Science Associates (ESA), 2003. *Proposed Malaga City Incorporation*. Draft Environmental Impact Report. Sacramento, California. June 13, 2003.

Fresno County Transportation Data, 2003. Website at: http://www.fresnoedc.com/Fresno_County_Data/Transportation_Data/Transportation_Brochure.pdf.

Gorman, L., 2003. Telephone conversation with Lynn Gorman, Fresno County Department of Public Works and Planning, September 26, 2003.

Liu, J., 2003. Telephone conversation with John Liu, Caltrans Fresno Office, September 11, 2003

Nakagawa, S., 2003. Telephone conversation with Stan Nakagawa, Fresno County Department of Public Works and Planning, September 30, 2003.

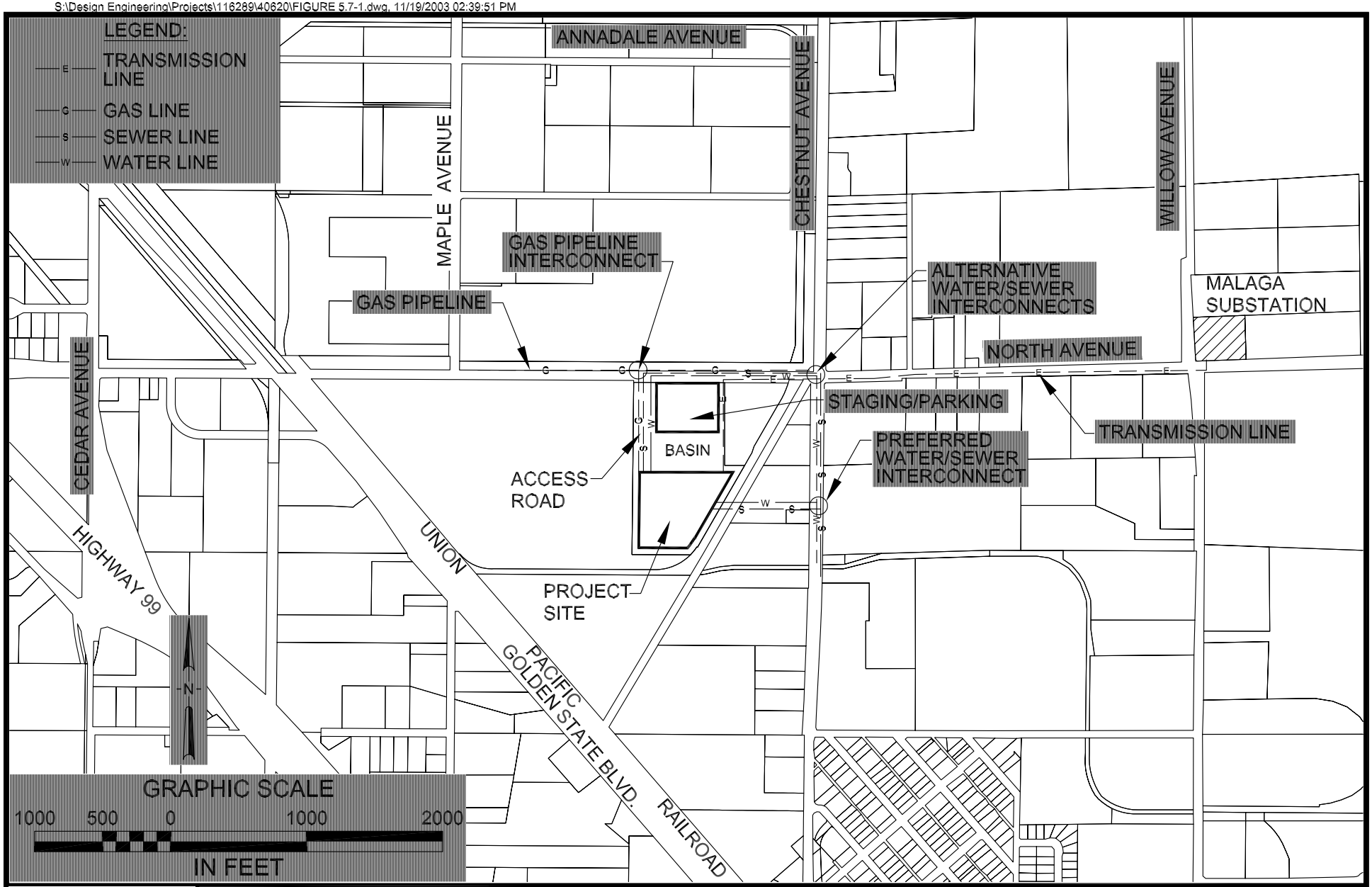
Rippole, I., 2003. Telephone conversation with Ivonne Rippole, Fresno County Department of Public Works and Planning, September 10, 2003.

Stites, M., 2003. Telephone conversation with Moses Stites, Caltrans Fresno Office, September 30, 2003.

Transportation Research Board, Highway Capacity Manual. 1981, 1985, 1994, 2000.

Wilson Engineering & Transportation Consultants, Inc., 2003. Site Visit and Gathering of Traffic Count Information. October, 2003.

S:\Design Engineering\Projects\116289\40620\FIGURE 5.7-1.dwg, 11/19/2003 02:39:51 PM




KRCD
Kings River Conservation District

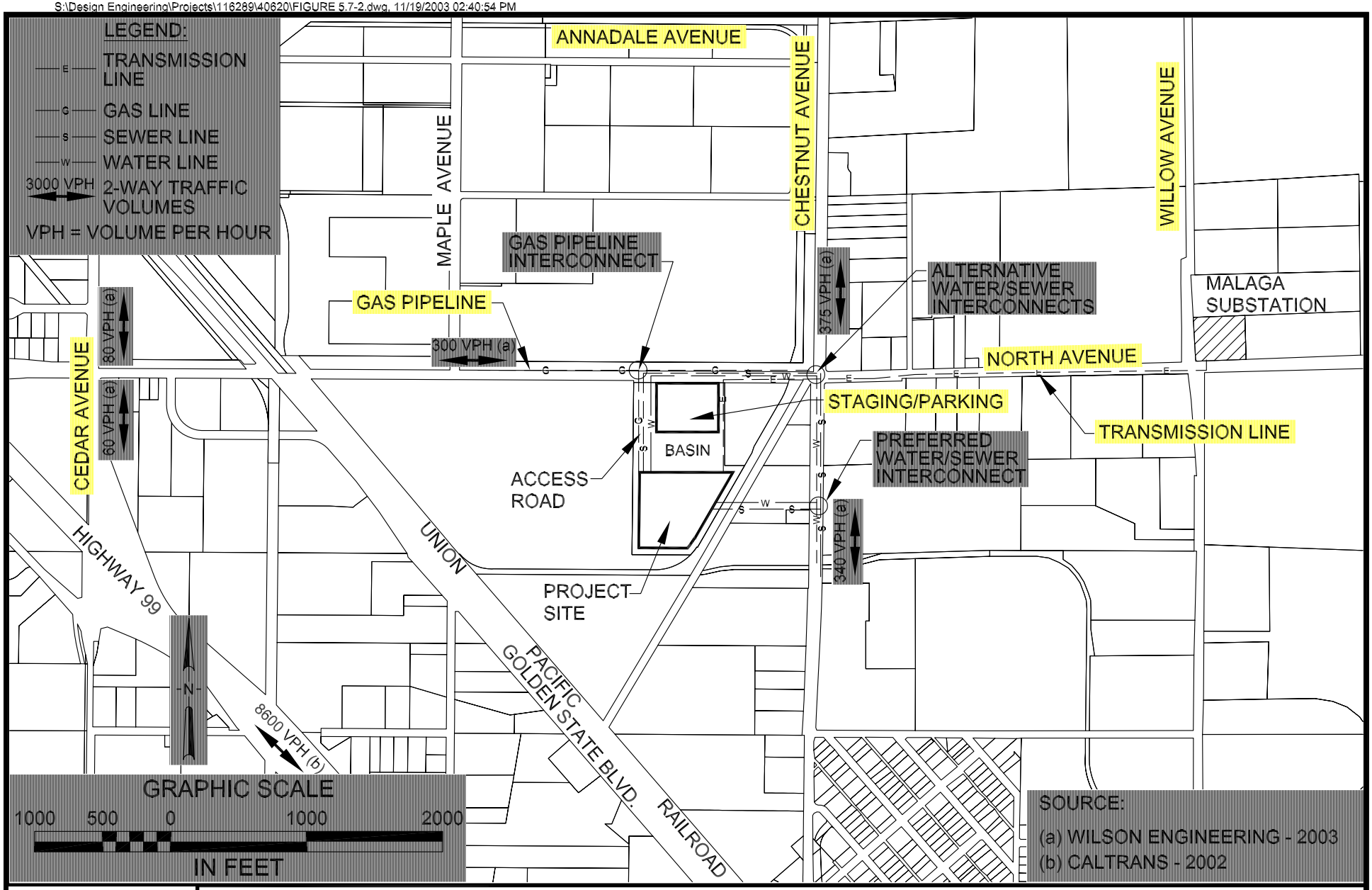
FIGURE 5.7-1

Major Roads In The
KRCDPP Project Site Area

KRCDPP

09/30/03 REV. 0

S:\Design Engineering\Projects\116289\40620\FIGURE 5.7-2.dwg, 11/19/2003 02:40:54 PM




KRCD
Kings River Conservation District

FIGURE 5.7-2

Existing Weekday P.M. Peak Hour
Traffic Volumes In The KRCDPP Project Site Area

KRCDPP

09/30/03 REV. 0

# SECTION 5.8 PUBLIC HEALTH

## 5.8.1 Introduction

This section provides an assessment of the potential risks to human health that are associated with the airborne emissions of non-criteria pollutants (i.e., emissions for which neither the National Ambient Air Quality Standards (NAAQS) nor California Ambient Air Quality Standards (CAAQS) have been established) from the proposed Kings River Conservation District Peaking Plant (KRCDPP). Section 5.8.2 describes the regional area including a description of the KRCDPP area and the nearby terrain. Section 5.8.3 discusses the federal, state and local laws, ordinances, regulations and standards (LORS) that are applicable to the KRCDPP as well as an identification of public health related permits that are required and applicable agency contacts. Section 5.8.4 provides a discussion of the potential impacts. This discussion is based on the results of a Health Risk Assessment (HRA), which provides an estimate of the potential impacts to human health from the release of (non-criteria) combustion by-products and other trace emissions. This section also presents an environmental checklist of possible impacts to public health associated with construction and operation of the KRCDPP. Section 5.8.5 provides a discussion of measures proposed to mitigate potential impacts and Section 5.8.6 discusses the potential for cumulative impacts.

The assessment of impacts from airborne emissions of criteria pollutants is presented in Section 5.1, Air Quality. Similarly, a discussion of potential impacts due to an accidental (emergency) release of acutely hazardous materials (i.e., aqueous ammonia) stored and used on-site is provided in Section 5.10, Hazardous Materials and Waste Management.

## 5.8.2 Affected Environment

Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. The KRCDPP is a simple-cycle peaking electrical power generating facility, which will consist of two LM6000 General Electric (GE) natural gas-fired combustion turbine (CT) generating units with supporting equipment and have a total electrical generating capacity of approximately 97 megawatts (MW).

KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge

associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections, as described below. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically

replaced as the treatment system is consumed. As described in Section 5.1, Air Quality, the onsite ZLD option with the greatest potential for air emissions impacts, i.e., the ZLD evaporative cooler option, has been assumed for the assessment of impacts due to non-criteria air emissions. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

#### *5.8.2.1 Sensitive Receptors*

The area surrounding the proposed KRCDPP site includes mostly industrial properties. There are 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E Malaga Substation located on the northeast intersection of North and Willow Avenues. The nearest of these residences is approximately 1,000 feet northeast of the center of KRCDPP project site, as shown on Figure 2.2-2 in Chapter 2, Project and Facility Description.

Numerous other sensitive receptors (including schools, places of worship, hospitals and emergency-response facilities, day-care and long-term health care facilities) are also located within a two-mile radius of the KRCDPP. Information on sensitive receptors was obtained through various computer-mapping programs (including Precision Streets, Topographic USA, and Microsoft Streets/Trips) and was verified through on-line phone book listings. Information on these sensitive receptors, including the approximate distance from the KRCDPP is included below.

**Schools**

The nearest school, the Malaga Elementary School located at 3910 S. Ward, is approximately .62 miles to the southeast of the KRCDPP project site. As shown below in Table 5.8-1, there are a total of 7 schools within an approximately 2-mile radius of the KRCDPP project site.

| Table 5.8-1<br>Schools Located Within 2 Miles of the Project Site<br>KRCDPP | | | |
|---|---|---|---|
| **School Name** | **Address** | **School District** | **Approximate Distance from KRCDPP[1]** |
| Malaga Elementary | 3910 S. Ward Avenue<br>Fresno, CA 93725-2538 | Fowler Unified | .62 miles |
| Aynesworth Elementary | 4765 E. Burns Avenue<br>Fresno, CA 93725-1732 | Fresno Unified | 1.5 miles |
| Ezekiel Balderas Elementary | 4625 E. Florence<br>Fresno, CA 93725-1110 | Fresno Unified | 1.8 miles |
| Calwa Elementary | 4303 E. Jensen Avenue<br>Fresno, CA 93725-2105 | Fresno Unified | 1.4 miles |
| Edith B. Storey Elementary | 5250 E. Church Avenue<br>Fresno, CA 93725-0900 | Fresno Unified | 2.2 miles |
| Elizabeth Terronez Middle School | 2300 S. Willow<br>Fresno, CA 93725 | Fresno Unified | 1.9 miles |
| Year-Round Achievement Center | 5090 E. Church<br>Fresno, CA 93725 | Fresno Unified | 1.8 miles |
| [1] Source: Microsoft Streets and Trips, 2001 | | | |

**Places of Worship**

The nearest house of worship, Jubilee Deliverance Ministries, is located along the north side of North Avenue, east of Chestnut Avenue and approximately 0.4 miles to the northeast of the KRCDPP project site. Other houses of worship within a 2 mile radius of the KRCDPP include: Celebration Christian Center located at 3757 South Ward Avenue and .6 miles from the KRCDPP, and Cristo Rey located at 3545 South Calvin Avenue and .6 miles from the KRCDPP.

**Hospitals/Emergency Response Facilities**

The nearest hospitals to the KRCDPP are the University Medical Center located at 445 South Cedar Avenue, and approximately 5 miles north of the KRCDPP and the Community Medical Center of Fresno located at Fresno and R Streets and approximately 5.8 miles northwest of the KRCDPP. In addition, Fresno County is served by six ambulance services or agencies for emergency response. American Ambulance is the sole 9-1-1 paramedic ambulance provider for over 4000 square miles of Fresno County and including the area of the KRCDPP. The communications center dispatches every 9-1-1 and non-emergent ambulance request and is located at the northeast corner of Divisadero

Street and Freeway 41. The average response time for emergency calls ranges from five to eight minutes (County of Fresno, 2000).

**Long-Term Health and Day Care Facilities**

There is one convalescent/long-term care facility located 1.2 miles from the KRCDPP, the Sunnyside Convalescent Hospital located at 2939 South Peach Avenue. The nearest day care facility is In & Out Daycare located at 2240 South Matus Avenue and 1.9 miles from the KRCDPP.

Terrain in the vicinity of the KRCDPP is relatively flat. Appendix 5.8-1 contains topographical maps (at a scale of 1:24,000) of the area within ten miles of the KRCDPP. These maps show terrain that is at or above the elevation of the KRCDPP's exhaust stacks.

### 5.8.3 Laws, Ordinances, Regulations, and Standards

Applicable federal, state and local LORS that affect public health and are potentially applicable to the KRCDPP are summarized below in Table 5.8-2.

**Table 5.8-2**
**Summary of Applicable LORS**
**KRCDPP**

| Regulation/Program | Regulatory/ Administering Agency | Public Health Concern | Description/Applicability |
|---|---|---|---|
| Federal & California Clean Air Acts, Health and Safety Code Section 39650, et. seq. | United States Environmental Protection Agency (USEPA), Region 9<br><br>California Air Resources Board (CARB)<br><br>San Joaquin Valley Air Pollution Control District (SJVAPCD) | Public exposure to air pollutants | Establish safe exposure limits for toxic air pollutants and identify pertinent Best Available Control Technologies (BACT) to protect the public from exposure to air pollutants. Require that the new source review (NSR) rule for each air pollution control district include regulations that require new or modified procedures for controlling the emissions of toxic air contaminants.<br><br>Based on results of the HRA, emissions of toxic air contaminants do not exceed acceptable levels (see Section 5.8.4.2). |

| Table 5.8-2<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Public Health Concern** | **Description/Applicability** |
| | | | Applying BACT will minimize emissions of criteria pollutants and increases in emissions of applicable criteria pollutants will be offset with emission reduction credits (ERCs). |
| 40 Code of Federal Regulations (CFR) 68-Risk Management Plan<br><br>California Health & Safety Code, Sections 25500 to 25545 - Hazardous Materials Management | US EPA, Region 9<br><br>CARB<br><br>Fresno County Office of Emergency Services (OES)<br><br>SJVAPCD | Public exposure to acutely hazardous materials | Establishes the public right to know about acutely hazardous materials accident risks that may affect their health and safety. Requires the preparation of an RMP where acutely hazardous materials are used. A RMP will be prepared prior to commencement of KRCDPP operations.<br><br>An off-site consequence analysis was performed to assess the potential risks from a spill or rupture of the aqueous ammonia storage tank. The results of this analysis indicate that significance level thresholds will not be exceeded at the nearest sensitive receptors (see Section 5.10, Hazardous Materials and Waste Management). |
| Health & Safety Code, Section 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986 aka Proposition 65) | Office of Environmental Health and Hazard Assessment (OEHHA) | Public exposure to chemicals known to cause cancer or reproductive toxicity | Based on results of the HRA, toxic threshold levels, which require exposure warnings per Proposition 65, are not exceeded (see Section 5.8.4). |
| California Health & Safety Code, §§ 44300 to 44394 -Air Toxics | CARB<br><br>SJVAPCD | Public exposure to toxic air | Requires facilities that use hazardous materials in sufficient quantities to prepare a HRA to |

| Table 5.8-2<br>Summary of Applicable LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Regulation/Program** | **Regulatory/ Administering Agency** | **Public Health Concern** | **Description/Applicability** |
| "Hot Spots" Information and Assessment of 1987 | | contaminants | evaluate and predict the dispersion of hazardous substances in the environment and the potential for exposure of human populations and to assess and quantify potential health risks. Based on results of the HRA, emissions of toxic air contaminants do not exceed acceptable levels (see Section 5.8.4). |

### *5.8.3.1 Required Permits and Agency Contacts*

There are several regulatory agencies responsible for ensuring health and safety of the public and for implementing the LORS addressed previously in Table 5.8-2. Contact information for applicable agencies is provided below in Table 5.8-3. There are no permits associated with public health that are applicable to the KRCDPP.

| Table 5.8-3<br>Agency Contacts – Public Health<br>KRCDPP | |
|---|---|
| **Agency** | **Telephone** |
| USEPA, Region 9<br>75 Hawthorne Street<br>San Francisco, CA 94105 | (415) 947-8000 |
| CARB<br>1001 I Street<br>Sacramento, CA 95812 | (916) 322-2990 |
| SJVAPCD – Fresno Office<br>1990 E. Gettysburg Avenue<br>Fresno, CA 93726 | (916) 230-6000 |
| Fresno County OES<br>1221 Fulton Mall, Third Floor<br>Fresno, CA 93725 | (559) 445-3391 |
| Fresno County Environmental Health Services Department<br>1221 Fulton Mall, Third Floor<br>Fresno, CA 93725 | (559) 445-3357 |

### 5.8.4 Environmental Consequences

#### *5.8.4.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant impact to public health. This section discusses the potential for significant impacts associated with construction or operation of the proposed KRCDPP in relation to the checklist questions in Table 5.8-4, below.

**Table 5.8-4**
**CEQA Environmental Checklist –Public Health**
**KRCDPP**

| PUBLIC HEALTH – Would the project: | Potentially Significant Impact | Less Than Significant With Mitigation | Less Than Significant | No Impact |
|---|---|---|---|---|
| a) Cause the surrounding population to be exposed to toxic pollutants at levels hazardous to health? | | | X | |

#### *5.8.4.2 Toxic (Non-criteria) Air Emissions*

Emissions of non-criteria pollutants, also known as toxic or hazardous air pollutants, from normal operation of a power generating facility can pose a potentially significant risk to public health, if these emissions are generated in sufficient quantities. For the KRCDPP's CTs, emissions of relatively small amounts of these substances result from the combustion of natural gas. For the cooling towers and ZLD evaporative tower, emissions, which are based on the composition of the water being used, are due to trace amounts being carried away in the towers' drift.

The KRCDPP used both Title III of the federal Clean Air Act, which lists 189 substances that are designated as hazardous air pollutants, and the California Toxic Inventory for the SJVAPCD to develop a list of potential toxic air emissions. Impacts from pollutants, emitted by the KRCDPP and on either of these lists, were evaluated.

##### 5.8.4.2.1 Emissions Rates

Emissions rates of non-criteria pollutants for the two CTs, two cooling towers and the ZLD evaporative tower are provided in Tables 5.8-5, 5.8-6 and 5.8-7, respectively.

**Table 5.8-5**
**Non-Criteria Emissions from the CTs**
**KRCDPP**

| Pollutant | Emission Factor (lbs/MMscf) | Max Fuel One CT (MMBtu/hr HHV) | Natural Gas (Btu/scf) | Maximum Annual Operating Hours | Emission Rate One CT (lbs/hr) | Emission Rate Both CTs (lbs/hr) | Emission Rate One CT (tons/year | Emission Rate Both CTs (tons/year) |
|---|---|---|---|---|---|---|---|---|
| Acetaldehyde | 1.80E-01 | 466.3 | 1025.9 | 3120 | 0.081815 | 0.16363 | 0.1276314 | 0.2552628 |
| Acrolein | 3.69E-03 | 466.3 | 1025.9 | 3120 | 0.0016772 | 0.0033544 | 0.0026164 | 0.0052329 |
| Ammonia (ppmv) | 10 | 466.3 | 1025.9 | 3120 | 6.54 | 13.08 | 10.2024 | 20.4048 |
| Benzene | 3.33E-03 | 466.3 | 1025.9 | 3120 | 0.0015136 | 0.0030272 | 0.0023612 | 0.0047224 |
| Benzo(a)anthracene* | 2.26E-05 | 466.3 | 1025.9 | 3120 | 1.027E-05 | 2.054E-05 | 1.602E-05 | 3.205E-05 |
| Benzo(a)pyrene* | 1.39E-05 | 466.3 | 1025.9 | 3120 | 6.318E-06 | 1.264E-05 | 9.856E-06 | 1.971E-05 |
| Benzo(b)fluoranthene* | 1.13E-05 | 466.3 | 1025.9 | 3120 | 5.136E-06 | 1.027E-05 | 8.012E-06 | 1.602E-05 |
| Benzo(k)fluoranthene* | 1.10E-05 | 466.3 | 1025.9 | 3120 | 5E-06 | 1E-05 | 7.8E-06 | 1.56E-05 |
| 1,3 Butadiene | 1.27E-04 | 466.3 | 1025.9 | 3120 | 5.773E-05 | 0.0001155 | 9.005E-05 | 0.0001801 |
| Chrysene* | 2.52E-05 | 466.3 | 1025.9 | 3120 | 1.145E-05 | 2.291E-05 | 1.787E-05 | 3.574E-05 |
| Dibenz(a,h)anthracene* | 2.35E-05 | 466.3 | 1025.9 | 3120 | 1.068E-05 | 2.136E-05 | 1.666E-05 | 3.333E-05 |
| Ethylbenzene | 3.26E-02 | 466.3 | 1025.9 | 3120 | 0.0148176 | 0.0296352 | 0.0231155 | 0.0462309 |
| Formaldehyde | 3.67E-01 | 466.3 | 1025.9 | 3120 | 0.1668117 | 0.3336234 | 0.2602262 | 0.5204524 |
| Hexane | 2.59E-01 | 466.3 | 1025.9 | 3120 | 0.1177227 | 0.2354454 | 0.1836474 | 0.3672948 |
| Indeno(1,2,3-cd)pyrene* | 2.35E-05 | 466.3 | 1025.9 | 3120 | 1.068E-05 | 2.136E-05 | 1.666E-05 | 3.333E-05 |
| Naphthalene* | 1.66E-03 | 466.3 | 1025.9 | 3120 | 0.0007545 | 0.001509 | 0.001177 | 0.0023541 |
| Propylene | 7.70E-01 | 466.3 | 1025.9 | 3120 | 0.3499864 | 0.6999727 | 0.5459787 | 1.0919574 |
| Propylene Oxide | 4.78E-02 | 466.3 | 1025.9 | 3120 | 0.0217264 | 0.0434529 | 0.0338932 | 0.0677864 |
| Toluene | 7.10E-02 | 466.3 | 1025.9 | 3120 | 0.0322715 | 0.0645429 | 0.0503435 | 0.100687 |
| Xylene | 2.61E-02 | 466.3 | 1025.9 | 3120 | 0.0118632 | 0.0237263 | 0.0185066 | 0.0370131 |
| **Totals (w/o Ammonia)** | | | | | 0.8010769 | 1.6021539 | 1.24968 | 2.4993601 |
| **Totals (w/ Ammonia)** | | | | | 7.3410769 | 14.682154 | 11.45208 | 22.90416 |

Emissions factors from EPA AP-42 and CATEF except for ammonia, which is based on 10 ppm
Max fuel input of 466.3 MMBtu/hr (HHV) based on 25 degree F ambient (420.1 MMBtu/hr - LHV)
Btu/scf factor based on median value for Line 400 natural gas supply.
Annual hrs based on 2,755 hpy normal operation & 365 hpy startup/shutdown operation.

**Acronyms:**
ppm – parts per million
PAH - Polycyclic Aromatic Hydrocarbon
lbs/MMscf - pounds per million standard cubic feet
Btu/scf – British thermal unit/per standard cubic feet
Lbs/hr – pounds per hour
MMBtu/hr HHV-million British thermal units per hour higher heating value
MMBtu/hr LHV - million British thermal units per lower higher heating value
ppmv-pounds per million by volume
hpy – hours per year

**Table 5.8-6**
**Non-Criteria Emissions from the Cooling Towers**
**KRCDPP**

| Pollutant | HAP or Non-Criteria Pollutant | Pollutant Concentration (mg/l) | Circulation Water Rate per Cell (gpm) | Cooling Tower Drift Rate (%) | Maximum Annual Operating Hours | Emission Rate 1 Cell (lbs/hr) | Emission Rate 4 Cells (lbs/hr) | Emission Rate 1 Cell (tons/year) | Emission Rate 4 Cells (tons/year) |
|---|---|---|---|---|---|---|---|---|---|
| Barium | No | 0.28 | 2000 | 0.001 | 3120 | 2.804E-06 | 1.121E-05 | 4.374E-06 | 1.75E-05 |
| Bicarbonate | No | 800 | 2000 | 0.001 | 3120 | 0.0080106 | 0.0320425 | 0.0124966 | 0.0499864 |
| Bromide | No | 0.332 | 2000 | 0.001 | 3120 | 3.324E-06 | 1.33E-05 | 5.186E-06 | 2.074E-05 |
| Calcium | No | 220 | 2000 | 0.001 | 3120 | 0.0022029 | 0.0088117 | 0.0034366 | 0.0137462 |
| Chloride | Yes | 108 | 2000 | 0.001 | 3120 | 0.0010814 | 0.0043257 | 0.001687 | 0.0067482 |
| Chromium | Yes | 0.064 | 2000 | 0.001 | 3120 | 6.409E-07 | 2.563E-06 | 9.997E-07 | 3.999E-06 |
| Magnesium | No | 104 | 2000 | 0.001 | 3120 | 0.0010414 | 0.0041655 | 0.0016246 | 0.0064982 |
| Nitrate | No | 128 | 2000 | 0.001 | 3120 | 0.0012817 | 0.0051268 | 0.0019995 | 0.0079978 |
| Potassium | No | 16 | 2000 | 0.001 | 3120 | 0.0001602 | 0.0006409 | 0.0002499 | 0.0009997 |
| Silica | No | 156 | 2000 | 0.001 | 3120 | 0.0015621 | 0.0062483 | 0.0024368 | 0.0097473 |
| Sodium | No | 124 | 2000 | 0.001 | 3120 | 0.0012416 | 0.0049666 | 0.001937 | 0.0077479 |
| Strontium | Yes | 1.2 | 2000 | 0.001 | 3120 | 1.202E-05 | 4.806E-05 | 1.874E-05 | 7.498E-05 |
| Sulfate | Yes | 68 | 2000 | 0.001 | 3120 | 0.0006809 | 0.0027236 | 0.0010622 | 0.0042488 |
| **Totals** | | | | | | 0.0172817 | 0.0691268 | 0.0269595 | 0.1078378 |

**Notes:**
There are two cooling towers, each with two cells.
Constituents are listed to develop the maximum solids emissions rate (assumed as PM10) from the cooling towers.

**Acronyms:**
mg/l – milligrams per liter
gpm –gallons per minute

**Table 5.8-7**
**Non-Criteria Emissions from the ZLD Evaporative Tower**
**KRCDPP**

| Pollutant | HAP or Non-Criteria Pollutant | Pollutant Concentration (mg/l) | Dry Solids (% by weight) | Solids Emissions (lbs/hr) | Solids Emissions (tons/year) |
|---|---|---|---|---|---|
| Barium | No | 0.28 | 0.012 | 7.40E-06 | 1.15E-05 |
| Bicarbonate | No | 800 | 34.425 | 2.01E-02 | 3.14E-02 |
| Bromide | No | 0.332 | 0.014 | 8.34E-06 | 1.30E-05 |
| Calcium | No | 263 | 11.317 | 6.61E-03 | 1.03E-02 |
| Chloride | Yes | 176 | 7.574 | 4.42E-03 | 6.90E-03 |
| Chromium | Yes | 0.064 | 0.003 | 1.61E-06 | 2.51E-06 |
| Magnesium | No | 104 | 4.475 | 2.61E-03 | 4.07E-03 |
| Nitrate | No | 128 | 5.508 | 3.22E-03 | 5.02E-03 |
| Potassium | No | 16 | 0.689 | 4.02E-04 | 6.27E-04 |
| Silica | No | 156 | 6.713 | 3.92E-03 | 6.12E-03 |
| Sodium | No | 145 | 6.24 | 3.64E-03 | 5.68E-03 |
| Strontium | Yes | 1.2 | 0.052 | 3.02E-05 | 4.71E-05 |
| Sulfate | Yes | 534 | 22.978 | 1.34E-02 | 2.09E-02 |
| **Totals** | | | 100.000 | 0.058 | 0.091 |

**Notes:**
Constituents are listed to develop the maximum solids emissions rate (assumed as PM10) from the spray dryer; however, only some constituents are a HAP or considered as a non-criteria pollutant for determining other air emissions impacts.
Tons/yr are based 3,120 hpy of operation.

#### 5.8.4.2.2 Assessment Methodology

The methodology described in the OEHHA guidance manual for the preparation of HRAs (OEHHA, 2003) was followed to calculate the potential health risks from KRCDPP. The analyses included an assessment of cancer risk, chronic health impacts, and acute health impacts. The calculation of health risks used the point-estimate approach and included inhalation and oral doses, with dermal absorption and soil ingestion. Chronic health impacts, as represented by chronic hazard index, included inhalation and oral doses. The inhalation route (short-term impacts) represented acute health impacts. Table 5.8-8 lists the inhalation and oral potency factors, acute Reference Exposure Levels (REL's), and chronic REL's, as applicable, from KRCDPP emissions. Tables 5.8-9 and 5.8-10 list the target organs affected from acute and chronic health impacts.

**Table 5.8-8**
**OEHHA/CARB Health Values for Use in Risk Assessments[1]**
**KRCDPP**

| Pollutant | Inhalation Cancer Potency)[1] (mg/kg-day | Oral Cancer Potency[1] (mg/kg-day) | Acute Inhalation REL[2] (µg/m$^3$) | Chronic Inhalation REL (µg/m$^3$) | Chronic Oral REL (mg/kg-day) |
|---|---|---|---|---|---|
| **CTs :** | | | | | |
| Acetaldehyde | 1.00E-02 | | | 9.00E+00 | |
| Acrolein | | | | 6.00E-02 | |
| Ammonia | | | 3.20E+03 | 2.00E+02 | |
| Benzene | 1.00E-01 | | 1.30E+03 | 6.00E+01 | |
| Benzo(a)anthracene* | 3.90E-01 | 1.2 | | | |
| Benzo(a)pyrene* | 3.90E+00 | 1.20E+01 | | | |
| Benzo(b)fluoranthene* | 3.90E-01 | 1.2 | | | |
| Benzo(k)fluoranthene* | 3.90E-01 | 1.2 | | | |
| 1,3 Butadiene | 6.00E-01 | | | 2.00E+01 | |
| Chrysene* | 3.90E-02 | 1.20E-01 | | | |
| Dibenz(a,h)anthracene* | 4.10E+00 | 4.1 | | | |
| Ethylbenzene | | | | 2.00E+03 | |
| Formaldehyde | 2.10E-02 | | 9.40E+01 | 3.00E+00 | |
| Hexane | | | | 7.00E+03 | |
| Indeno(1,2,3-cd)pyrene* | 3.90E-01 | 1.2 | | | |
| Naphthalene* | | | | 9.00E+00 | |
| Propylene | | | | 3.00E+03 | |

**Table 5.8-8**
**OEHHA/CARB Health Values for Use in Risk Assessments[1]**
**KRCDPP**

| Pollutant | Inhalation Cancer Potency)[1] (mg/kg-day | Oral Cancer Potency[1] (mg/kg-day) | Acute Inhalation REL[2] (µg/m$^3$) | Chronic Inhalation REL (µg/m$^3$) | Chronic Oral REL (mg/kg-day) |
|---|---|---|---|---|---|
| Propylene oxide | 1.30E-02 | | 3.10E+03 | 3.00E+01 | |
| Toluene | | | 3.70E+04 | 3.00E+02 | |
| Xylene | | | 2.20E+04 | 7.00E+02 | |
| Carbon monoxide | | | 2.30E+04 | | |
| Nitrogen dioxide | | | 4.70E+02 | | |
| Sulfur dioxide | | | 6.60E+02 | 2.50E+01 | |
| **Cooling Tower and ZLD:** | | | | | |
| Chromium | 5.10E+00 | | | 2.00E-01 | 2.00E-02 |
| Sulfate | | | 1.20E+02 | | |

[1] OEHHA (2003)
[2] 1-hour average for all pollutants except benzene, which uses 6-hour average
[3] PAH

**Acronyms:**
mg/kg/day – milligrams per kilograms per day
µg/m$^3$ – micrograms per cubic meter

**Table 5.8-9**
**OEHHA/CARB Acute Reference Exposure Levels and Target Organs**
**KRCDPP**

| | REL | TARGET ORGAN | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Substance** | **µg/m³** | **Cardiovascular** | **Eye** | **Developmental** | **Hematologic** | **Immune** | **Reproductive** | **Respiratory** | **Nervous** |
| **CTs:** | | | | | | | | | |
| Ammonia | 3.2E+03 | | X | | | | | | |
| Benzene | 1.3E+03 | | | X | X | X | X | | |
| Carbon monoxide | 2.3E+04 | X | | | | | | | |
| Formaldehyde | 9.4E+01 | | X | | | X | | X | |
| Nitrogen dioxide | 4.70E+2 | | | | | | | X | |
| Propylene oxide | 3.1E+03 | | X | X | | | X | X | |
| Sulfur dioxide | 6.6E+02 | | | | | | | X | |
| Toluene | 3.7E+04 | | X | X | | | X | X | X |
| Xylene | 2.2E+04 | | X | | | | | X | |
| **Cooling Towers & ZLD:** | | | | | | | | | |
| Sulfates | 1.2E+02 | | | | | | | X | |

Source: OEHHA, 2003

| Table 5.8-10<br>OEHHA/ARB Chronic Reference Exposure Levels and Target Organs[1]<br>KRCDPP | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TARGET ORGAN | | | | | | | | | |
| **Substance** | **REL µg/m$^3$** | **Alimentary** | **Eye** | **Developmental** | **Hematologic** | **Reproductive** | **Respiratory** | **Nervous** | **Endocrine** | **Kidney** |
| **CTs :** | | | | | | | | | | |
| Acetaldehyde | 9.00E+00 | | | | | | X | | | |
| Acrolein | 6.00E-02 | | X | | | | X | | | |
| Ammonia | 2.00E+02 | | | | | | X | | | |
| Benzene | 6.00E+01 | | | X | X | | | X | | |
| 1,3 Butadiene | 2.00E+01 | | | | | X | | | | |
| Ethylbenzene | 2.00E+03 | X | | X | | | | | X | X |
| Formaldehyde | 3.00E+00 | | X | | | | X | | | |
| Hexane | 7.00E+03 | | | | | | | X | | |
| Naphthalene | 9.00E+00 | | | | | | X | | | |
| Propylene | 3.00E+03 | | | | | | X | | | |
| Propylene oxide | 3.00E+01 | | | | | | X | | | |
| Sulfur dioxide | 2.5E+01 | | | | | | | | | |
| Toluene | 3.00E+02 | | | X | | | X | X | | |
| Xylene | 7.00E+02 | | | | | | X | X | | |
| **Cooling Towers & ZLD:** | | | | | | | | | | |
| Chromium – inh[2] | 2.00E-01 | | | | | | X | | | |
| Chromium – oral[3] | 2.00E-02 | | | | X | | | | | |

[1] OEHHA, 2003
[2] Inh - inhalation route
[3] Oral route units of mg/kg-day

The analysis identified the location of the highest impacts and assumed those impacts would represent the Maximally Exposed Individual (MEI). Assumptions for the variables used in the analysis are provided in Appendix 5.8-2. If the results of the HRA for the MEI demonstrate less than significant impacts, than the potential impacts to all other receptors/individuals will also be less than significant.

Dispersion modeling for the risk analyses followed the modeling methodology described in Section 5.1, Air Quality. The receptor grid system used to calculate health risks did not change from that used in the air quality analyses. The highest normalized concentrations, X/Q, [(µg/m$^3$)/(gm/sec)] from operation of the CTs were projected to occur under the KRCDPP's Case 9 operating scenario (refer to the discussion of modeling assumptions and parameters in Section 5.1), consequently dispersion modeling for the risk analyses in this section only included the stack parameters calculated for Case 9. The operating

parameters for the cooling towers and ZLD tower remained the same regardless of the KRCDPP's operating scenarios.

In order to calculate cancer risk impacts, cancer potency and dose were multiplied together for each substance and then summed. The acute and chronic (inhalation) hazard indices were calculated by multiplying each substance emission rate by the normalized concentration and dividing by the REL. To compute the chronic (oral) hazard index, the dose of each substance was divided by the chronic (oral) REL. Summaries of these calculations can be found in Appendix 5.8-2. Summaries of the dispersion modeling results may also be found in Appendix 5.8-3.

**Assessment of Health Risk**

Generally, increased cancer risks of less than 1 in a million ($1 \times 10^{-6}$) and hazard indices of less than 1 are considered acceptable levels of health risk. The maximum excess lifetime cancer risk for the KRCDPP was projected to be 0.008 in a million ($.008 \times 10^{-6}$) or 8 in a billion ($8 \times 10^{-9}$). The maximum impacts occurred at the southeast fence line. The acute and chronic hazard indices for each target organ are summarized in Tables 5.8-11 and 5.8-12. The largest single acute hazard index is slightly less than 0.02 ($2 \times 10^{-2}$) and the total acute hazard index is approximately 0.0214 ($2.14 \times 10^{-2}$). The largest single chronic hazard index is 0.000285 ($2.85 \times 10^{-4}$) and the total chronic hazard index is approximately 0.000439 ($4.39 \times 10^{-4}$). Therefore, the KRCDPP's projected health risks are well within acceptable levels. Summaries of these calculations may be found in Appendix 5.8-2.

**Table 5.8-11**
**Individual Acute Hazard Quotients and Total Acute Hazard Index**
**KRCDPP**

| | REL | HAZARD QUOTIENTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Substance** | **µg/m³** | **Cardiovascular** | **Eye** | **Developmental** | **Hematologic** | **Immune** | **Reproductive** | **Respiratory** | **Nervous** |
| **CTs:** | | | | | | | | | |
| Ammonia | 3.2E+03 | | 4.69E-04 | | | | | | |
| Benzene | 1.3E+03 | | | 7.04E-08 | 7.04E-08 | 7.04E-08 | 7.04E-08 | | |
| Carbon monoxide | 2.3E+04 | 3.33E-04 | | | | | | | |
| Formaldehyde | 9.4E+01 | | 4.07E-04 | | | 4.07E-04 | | 4.07E-04 | |
| Nitrogen dioxide | 4.70E+2 | | | | | | | 1.49E-02 | |
| Propylene oxide | 3.1E+03 | | 1.61E-06 | 1.61E-06 | | | 1.61E-06 | 1.61E-06 | |
| Sulfur dioxide | 6.6E+02 | | | | | | | 1.84E-04 | |
| Toluene | 3.7E+04 | | 2.00E-07 | 2.00E-07 | | | 2.00E-07 | 2.00E-07 | 2.00E-07 |
| Xylene | 2.2E+04 | | 1.24E-07 | | | | | 1.24E-07 | |
| **Cooling Tower:** | | | | | | | | | |
| Sulfates | 1.2E+02 | | | | | | | 7.15E-07 | |
| **ZLD:** | | | | | | | | | |
| Sulfates | 1.2E+02 | | | | | | | 4.35E-03 | |
| **Total Hazard Index** | | 3.33E-04 | 8.78E-04 | 1.88E-06 | 7.04E-08 | 4.07E-04 | 1.88E-06 | 1.98E-02 | 2.00E-07 |

**Table 5.8-12**
**Individual Chronic Hazard Quotients and Total Chronic Hazard Index**
**KRCDPP**

| Substance | HAZARD QUOTIENT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | REL µg/m$^3$ | Alimentary | Eye | Developmental | Hematologic | Reproductive | Respiratory | Nervous | Endocrine | Kidney |
| **CTs:** | | | | | | | | | | |
| Acetaldehyde | 9.00E+0 | | | | | | 1.67E-05 | | | |
| Acrolein | 6.00E-2 | | 5.14E-05 | | | | 5.14E-05 | | | |
| Ammonia | 2.00E+2 | | | | | | 6.02E-05 | | | |
| Benzene | 6.00E+1 | | | 4.64E-08 | 4.64E-08 | | | 4.64E-08 | | |
| 1,3 Butadiene | 2.00E+1 | | | | | 5.31E-09 | | | | |
| Ethylbenzene | 2.00E+3 | 1.36E-08 | | 1.36E-08 | | | | | 1.36E-08 | 1.36E-08 |
| Formaldehyde | 3.00E+0 | | 1.02E-04 | | | | 1.02E-04 | | | |
| Hexane | 7.00E+3 | | | | | | | 3.09E-08 | | |
| Naphthalene | 9.00E+0 | | | | | | 1.54E-07 | | | |
| Propylene | 3.00E+3 | | | | | | 2.15E-07 | | | |
| Propylene oxide | 3.00E+1 | | | | | | 1.33E-06 | | | |
| Sulfur dioxide | 2.5E+1 | | | | | | 3.90E-05 | | | |
| Toluene | 3.00E+2 | | | 1.98E-07 | | | 1.98E-07 | 1.98E-07 | | |
| Xylene | 7.00E+2 | | | | | | 3.12E-08 | 3.12E-08 | | |
| **Cooling Towers:** | | | | | | | | | | |
| Chromium – inh[1] | 2.00E-1 | | | | | | 7.13E-06 | | | |
| Chromium – oral[2] | 2.00E-2 | | | | 6.98E-08 | | | | | |

| Table 5.8-12<br>Individual Chronic Hazard Quotients and Total Chronic Hazard Index<br>KRCDPP | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Substance** | **HAZARD QUOTIENT** | | | | | | | | | |
| | **REL µg/m³** | **Alimentary** | **Eye** | **Developmental** | **Hematologic** | **Reproductive** | **Respiratory** | **Nervous** | **Endocrine** | **Kidney** |
| **CTs:** | | | | | | | | | | |
| **ZLD:** | | | | | | | | | | |
| Chromium – inh | 2.00E-1 | | | | | | 6.98E-06 | | | |
| Chromium – oral | 2.00E-2 | | | | 6.83E-08 | | | | | |
| **Total Hazard Index** | | 1.36E-08 | 1.53E-04 | 2.58E-07 | 1.85E-07 | 5.31E-09 | 2.85E-04 | 3.07E-07 | 1.36E-08 | 1.36E-08 |
| [1]Inh - inhalation route<br>[2]Oral route units of mg/kg-day | | | | | | | | | | |

### *5.8.4.3 Criteria Air Emissions*

Impacts from the KRCDPP's emissions of criteria pollutants are discussed in Section 5.1, Air Quality, which demonstrates that the KRCDPP operations will not cause or significantly contribute to a violation of any NAAQS or CAAQS. Because these ambient air quality standards have been developed to protect public health, the KRCDPP's emissions of criteria pollutants will not result in any significant impacts to public health.

### *5.8.4.4 Hazardous Materials*

As discussed in Section 5.10, Hazardous Materials and Waste Management, the KRCDPP will use and store a variety of hazardous materials. The normal use and storage of these materials will not result in any significant adverse impacts to public health; however, while precautionary and mitigation measures will be used in the handling and storage of hazardous materials, an accidental release is possible. The potential impacts from such an incident are discussed in Section 5.10, Hazardous Materials and Waste Management, which concludes that the likelihood of such an event is low and the potential impacts are not significant.

### *5.8.4.5 Odors*

The KRCDPP will inject aqueous ammonia into the CT exhaust streams to minimize emissions of nitrogen oxides. The nature of this process results in a small amount of un-

reacted ammonia (ammonia slip) be released into the atmosphere via the CT exhaust stacks. Since the concentration of this ammonia slip at the point of release will be no more than 10 parts per million (ppm) and its concentration at or near ground level after mixing with and dispersing into the ambient air will be less than 5 ppm. This amount of ammonia slip is below the human detection threshold, this will result in no odor impact.

### 5.8.5 Proposed Mitigation Measures

#### *5.8.5.1 Toxic Air Emissions*

The KRCDPP's emissions on non-criteria pollutants will be minimized through the use of natural gas as the only fuel.

#### 5.8.5.2 *Criteria Air Emissions*

As discussed in Section 5.1, Air Quality, the KRCDPP will employ the use of BACT to minimize the emissions of criteria pollutants. Further, for those emissions, which are classified as non-attainment of either the NAAQS or CAAQS which are pre-cursor pollutants with respect to non-attainment pollutants, the KRCDPP is providing ERCs to fully offset the effects of its own emissions.

#### *5.8.5.3 Hazardous Materials*

Mitigation measures for the KRCDPP's use and storage of hazardous materials are provided in Section 5.10, Hazardous Materials and Waste Management. These measures include special storage and handling of hazardous materials, fire prevention and safety/emergency response training for operations and construction personnel.

#### *5.8.5.4 Odors*

No mitigation is proposed for odors, as there will be no potentially significant impacts.

### 5.8.6 Cumulative Impacts

The KRCDPP has requested copies of all Assembly Bill 2588 toxic inventory reports and HRAs for facilities within a two-mile radius of the KRCDPP from the SJVAPCD. The purpose of obtaining this information is to compare the estimated impacts from the KRCDPP's emissions of non-criteria pollutants with those of other facilities in the vicinity and determine whether there is a significant potential for a cumulative impact effect. At the time of filing the KRCDPP's Small Power Plant Exemption (SPPE) application, this information had not been received.

### 5.8.7 References

California Health and Safety Code. Various sections. Website at: http://www.leginfo.ca.gov/calaw.html.

GWF, 2000. Application for a Small Power Plant Exemption. Prepared by GWF Power Systems. May 2000.

Modesto Irrigation District, 2003. Administrative Draft Application for a Small Power Plant Exemption. Prepared by CH2M Hill for Modesto Irrigation District. April 14, 2003.

OEHHA (California), 2003. The Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, August 2003.

# SECTION 5.9 WORKER HEALTH AND SAFETY

## 5.9.1 Introduction

This section describes various programs and procedures that will be established and implemented during construction and operation and maintenance (O&M) of the Kings River Conservation District Peaking Plant (KRCDPP). The programs will be established in accordance with all applicable federal, state and local laws, ordinances, regulations and standards (LORS) to ensure the safety and well being of all workers involved in either the construction of or ongoing O&M activities associated with the proposed KRCDPP. This section also contains information on the safety training programs, methods of controlling anticipated hazards, fire protection, and the LORS applicable to the proposed KRCDPP.

## 5.9.2 Affected Environment

The KRCDPP will consist of an approximately 97 megawatt (MW) natural gas-fired peaking power plant to be developed on a 9.5-acre parcel in an industrial area south of the City of Fresno and near the Community of Malaga, Fresno County, California. KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres, which includes an existing 4-acre basin, would be used for temporary staging and parking during construction. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Fuel will be natural gas supplied from an approximately 700 foot interconnection to the existing local Pacific Gas and Electric (PG&E) gas transmission line that parallels North Avenue. The natural gas will be compressed and filtered on site to meet General Electric requirements.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line

will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection from this water supply would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The interconnection would run within the same right-of-way as either the preferred or alternative water supply linears described in the above paragraph.

### 5.9.3 Laws, Ordinances, Regulations and Standards

The construction and O&M of the KRCDPP will be in compliance with all applicable LORS. Table 5.9-1 provides a summary of federal, state and local LORS that relate to worker health and safety.

| Table 5.9-1<br>Worker Health and Safety LORS<br>KRCDPP | | |
|---|---|---|
| **Regulation/Standard** | **Applicable LORS** | **Requirement/Compliance** |
| Federal Occupational Safety and Health Act (OSHA) | Title 29 Code of Federal Regulations (CFR), Part 1910 | Contains federal health and safety regulations pertaining to general industry. |
| | Title 29 CFR, Part 1926 | Contains federal health and safety regulations pertaining to construction activities. |
| California Occupational Safety and Health Act of 1973 (Act) / California Occupational Health and Safety Administration (Cal-OSHA)[1] | Title 8 California Code of Regulations (CCR) | Establishes Cal OSHA and establishes minimum safety and health standards for work operations occurring in California. |
| | Title 8 CCR, Section 339 | Requires listing of hazardous chemicals relating to the Hazardous Substance Information and Training Act. |
| | Title 8 CCR, Sections 450 et seq. and 560 et seq. | Establishes safety orders for pressurized vessels including: air tanks, anhydrous ammonia, and general safe work practices. |
| | Title 8 CCR, Section 750 et seq. | Establishes safety orders for work with high pressure steam. |
| | Title 8 CCR, Construction Safety Orders (Sections 1500 et seq. and 1938 et seq.) | Establishes safety orders for construction work. |
| | Title 8 CCR, Sections 1508 et seq. and 1527 et seq. | Includes the requirements for the Injury and Illness Prevention Program (IIPP), Personal Protective Equipment (PPE), and general site safety. |
| | Title 8 CCR, Sections 1528 et seq. and 1537 et seq. | Requirements for controlling exposures to hazardous air contaminants. |
| | Title 8 CCR, Sections 1539 et seq. and 1547 et seq. | Requirements for excavation and trenching. |
| | Title 8 CCR, Sections 1590 et seq. and 1596 et seq. | Requirements for earth moving and haulage. |
| | Title 8 CCR, Sections 1597 et seq. and 1599 et seq. | Requirements for vehicles, traffic control, flaggers, barricades, and warning signs. |
| | Title 8 CCR, Sections 1604 et seq. and 1605 et seq. | Requirements for construction hoists. |

| Table 5.9-1<br>Worker Health and Safety LORS<br>KRCDPP | | |
|---|---|---|
| **Regulation/Standard** | **Applicable LORS** | **Requirement/Compliance** |
| | Title 8 CCR, Sections 1620 et seq. and 1635 et seq. | Requirements for railings , ramps, stairs, access and egress, openings in floors, roofs, and walls, and temporary floors. |
| | Title 8 CCR, Sections 1635 et seq. and 1667 et seq. | Requirements for scaffolding. |
| | Title 8 CCR, Sections 1669 et seq. and 1678 et seq. | Requirements for safety belts, nets, and ladders. |
| | Title 8 CCR, Sections 1680 et seq. and 1708 et seq. | Requirements for saws, power-actuated tools, and miscellaneous tools and equipment. |
| | Title 8 CCR, Sections 1709 et seq. and 1722 et seq. | Requirements for steel reinforcing, concrete pouring, and structural steel erection operations. |
| | Title 8 CCR, Sections 1760 et seq. | Electrical requirements for construction work. |
| | Title 8 CCR, Sections 1920 et seq. and 1938 et seq. | Requirements for construction related fire protection and prevention. |
| | Title 8 CCR, Electrical Safety Orders (Sections 2299 et seq. and 2974 et seq.) | Establishes safety orders for installation of low and high voltage electrical systems. |
| | Title 8 CCR, General Industry Safety Orders (Sections 3200 et seq. and 6184 et seq.) | Establishes safety orders for general industry work, including O&M. |
| | Title 8 CCR, Sections 3200 et seq. and 3583 et seq. | Requirements for IIPP, PPE, and general site safety. |
| | Title 8 CCR, Sections 3620 et seq. and 3920 et seq. | Requirements for mobile equipment operation. |
| | Title 8 CCR, Sections 3940 et seq. and 4647 et seq. | Requirements for power transmission equipment, rotating equipment, moving parts, points of operation, etc. |
| | Title 8 CCR, Sections 4794 et seq. and 4884 et seq. | Requirements for compressed gases and gas systems for cutting and welding. |
| | Title 8 CCR, Sections 4850 et seq. and 4853 et seq. | Requirements for electric welding. |
| | Title 8 CCR, Sections 4884 et seq. and 5049 et seq. | Requirements for cranes and other hoisting equipment. |
| | Title 8 CCR, Sections 5094 et seq. and 5100 et seq. | Requirements for control of excessive noise exposure and ergonomic hazards. |

| Table 5.9-1<br>Worker Health and Safety LORS<br>KRCDPP | | |
|---|---|---|
| **Regulation/Standard** | **Applicable LORS** | **Requirement/Compliance** |
| | Title 8 CCR, Sections 5139 et seq. and 5223 et seq. | Requirements for the control of hazardous substances, including Hazard Communication program requirements. |
| | Title 8 CCR, Sections 5615 et seq. and 5629 et seq. | Requirements for the control of hazards from flammable liquids, gases, and vapors. |
| | Title 8 CCR, Sections 6150 et seq. and 6184 et seq. | Requirements for fire protection and prevention. |
| | Title 8 CCR, Part 6 | Provides health and safety requirements for working with tanks and boilers. |
| California Health and Safety Code | Sections 25500 et seq. and 25520 et seq. | Requires every facility that handles, treats, stores, or disposes of hazardous material to establish business and area plans relating to the handling and release or threatened release of hazardous materials.<br>Requires the submission of an annual inventory of hazardous materials. |
| | Sections 25531 et seq. and 25543 et seq. | Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan. |
| Uniform Fire Code | Article 80 | Requires the prevention, control, and mitigation of dangerous conditions related to the storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel. |
| National Fire Protection Association (NFPA) | Section 10: Portable Fire Extinguishers | Requirements for selection, placement, inspections, maintenance, and employee training for portable fire extinguishers. |
| | Section 12: Carbon Dioxide Fire Extinguishing Systems | Requirements for the installation and use of carbon dioxide extinguishing systems. |
| | Sections 13 & 13A: Sprinkler Systems | Guidelines for the selection, installation, and testing of fire sprinkler systems. |
| | Section 14: Standpipe and Hose Systems | Guidelines for the selection and installation of standpipe and hose fire protection systems. |
| | Section 15: Water Spray Fixed Systems | Guidelines for selection and installation of fixed water spray systems. |

| Table 5.9-1<br>Worker Health and Safety LORS<br>KRCDPP | | |
|---|---|---|
| **Regulation/Standard** | **Applicable LORS** | **Requirement/Compliance** |
| | Section 16: Water Tanks and Private Fire Protection | Requirements for water tanks that are used for private fire protection. |
| | Section 24: Installation of Private Fire Service Mains and their Appurtenances | Requirements for installation of private fire service mains and appurtenances. |
| | Section 26: Supervision of Valves Controlling Water Supplies | Provides guidance for the installation and supervision of valves used to control water supplies. |
| | Section 30: Flammable and Combustible Liquids | Requirements for storage, transfer, and use of flammable and combustible liquids. |
| | Section 37: Stationary Combustion Engines and Gas Turbines | Provides fire protection requirements for the installation and use of combustion engines and gas turbines. |
| | Section 50A: Gaseous Hydrogen Systems | Provides fire protection requirements for hydrogen systems. |
| | Section 54: National Fuel Gas Code | Provides fire protection requirements for the use of fuel gas. |
| | Section 70, 70B, & 70E: National Electrical Code | Guidance on the safe selection and work practices associated with the design, installation, construction, and maintenance of electrical systems. |
| | Section 71: Installation, Maintenance, and Use of Central Station Signaling Systems | Provides requirements for the installation, maintenance, and use of central station signaling systems. |
| | Section 72A, 72E, & 72F: Local Protective Signaling System, Automatic Fire Detection System, Emergency Voice/Alarm Communication System | Provides requirements for the design, installation, use, and maintenance of local protective signaling systems, automatic fire detection systems, and emergency communication systems. |
| | Section 78: Lightning Protection Code | Provides requirements for lightning protection. |
| | Section 80: Fire Doors and Windows | Provides requirements for fire doors and windows. |
| | Section 90A: Installation of Air Conditioning and Ventilation Systems | Provides guidance for the installations of air conditioning and ventilation systems. |
| | Section 101: Life Safety, Fire in Buildings and Structures | Requirements for the design and construction of means of egress from structures. |

| Table 5.9-1<br>Worker Health and Safety LORS<br>KRCDPP | | |
|---|---|---|
| **Regulation/Standard** | **Applicable LORS** | **Requirement/Compliance** |
| | Section 291: Fire Flow Testing and Marking of Hydrants | Requirements for flow testing and marking of fire hydrants. |
| | Section 1962: Care, Maintenance, and Use of Fire Hoses | Requirements for the care, use, and maintenance of fire hoses, connections, and nozzles. |
| Construction Standards | American National Standards Institute (ANSI)/ American Society for Mechanical Engineers (ASME) Boiler and Pressure Vessel Code | Provides specifications and requirements for boilers and pressure vessels. |
| | ANSI, B31.2, Fuel Gas Piping | Provides specifications and requirements for fuel gas piping. |
| [1] Cal-OSHA has primary jurisdiction for implementing the Act and for worker health and safety. These regulations are provided for reference purposes and apply as referenced in Cal-OSHA regulations. | | |

### *5.9.3.1 Required Permits and Agency Contacts*

The proposed KRCDPP will also require several permits and authorizations from agencies whose responsibility it is to protect worker health and safety. Permits that will likely be required by the proposed KRCDPP are discussed below in Table 5.9-2. These permits would be obtained on as needed basis from the local Cal-OSHA district or field office. Since the permits will likely be required at various points in the construction process, no permitting schedule is provided.

| Table 5.9-2<br>Health and Safety Permits<br>KRCDPP | | | |
|---|---|---|---|
| **Permit** | **Issuing Agency** | **Application Requirements** | **Permit Procurement** |
| Trenching and Excavation Permit | Cal-OSHA | Required for trenches and excavations more than five feet deep and into which personnel are required to enter or which are adjacent to structures. | Submit completed permit application to Cal-OSHA district or field office prior to commencing trenching/excavation. |
| Construction Permit | Cal-OSHA | Required for construction of buildings, structures, scaffolding, or falsework more than three stories high. | Submit completed permit application to Cal-OSHA district or field office |

| Table 5.9-2<br>Health and Safety Permits<br>KRCDPP | | | |
|---|---|---|---|
| **Permit** | **Issuing Agency** | **Application Requirements** | **Permit Procurement** |
| | | | prior to commencing construction. |
| Demolition Permit | Cal-OSHA | Required for demolition of any building, structure, or the dismantling of scaffolding or falsework more than three stories high | Submit completed permit application to Cal-OSHA district or field office prior to commencing demolition. |

There are also several regulatory agencies responsible for ensuring worker health and safety and implementing the LORS addressed previously in Table 5.9-1. Contact information for applicable agencies is included in Table 5.9-3, below.

| Table 5.9-3<br>Agency Contacts – Worker Health and Safety<br>KRCDPP | |
|---|---|
| **Agency Name and Address** | **Telephone** |
| Fresno County Office of Emergency Services<br>1221 Fulton Mall, Third Floor<br>Fresno, CA 93775 | (559) 445-3391 |
| Fresno County Environmental Health Services<br>1221 Fulton Mall, Third Floor<br>Fresno, CA 93775 | (559) 445-3357 |
| Fresno County Fire Protection District<br>#87 South Fresno<br>4706 E. Drummond<br>Fresno, CA 93727 | (559) 485-2800 |
| Cal-OSHA-District Office-Sacramento<br>2424 Arden Way, Suite 165<br>Sacramento, CA 95825 | (916) 263-0704 |
| Cal-OSHA-Central Valley-Fresno<br>2550 Mariposa Street, Suite 4000<br>Fresno, CA 93721 | (559) 454-1295 |

## 5.9.4 Environmental Consequences

### *5.9.4.1 Environmental Checklist*

The CEC will be using applicable excerpts from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist to assess the potential for significant

impacts as a result of the proposed KRCDPP. The CEQA checklist does not contain questions pertaining specifically to worker health and safety and therefore no checklist is presented in this section. Environmental Checklist questions that are related to worker health and safety are addressed in other sections of this application including, Noise and Hazardous Materials and Waste Management, which are Sections 5.2 and 5.10, respectively.

### *5.9.4.2 Impact Assessment*

Certain construction and O&M activities associated with the proposed KRCDPP have the potential to expose workers to a wide variety of physical and chemical hazards. Table 5.9-4 below includes a discussion of the potential hazards expected as a result of construction and/or O&M of the KRCDPP. This list of potential hazards is generic to facilities of this type. Construction hazards will be further evaluated during appropriate phases of construction activities to identify site-specific hazards and develop appropriate controls. O&M hazards also will be modified as appropriate to account for changes in plant operations or equipment used. Worker exposure to these hazards will be minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of PPE, and compliance with the applicable health and safety LORS presented above in Table 5.9-1.

**Table 5.9-4**
**Hazard Analysis**
**KRCDPP**

| Activity | Exposure Potential* | Potential Hazard | Proposed Control Strategies |
|---|---|---|---|
| Motor Vehicle and Heavy Equipment Operation | C, O&M | Employee injury and property damage from collisions with workers and/or facility equipment. | Implement motor vehicle and heavy equipment safety program. Ensure that operators are properly trained. |
| Forklift Operation | C, O&M | Same as heavy equipment operation (above). | Implement forklift operation program. |
| Trenching and Excavation | C, O&M | Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities. | Implement an excavation and trenching safety program, ensure operators are properly trained. Require appropriate permits prior to initiating excavation or trenching. |
| Work at Elevation | C, O&M | Employee injury due to falls from the same level and elevated areas. | Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet. |

| Table 5.9-4<br>Hazard Analysis<br>KRCDPP | | | |
|---|---|---|---|
| **Activity** | **Exposure Potential*** | **Potential Hazard** | **Proposed Control Strategies** |
| General Project Work | C, O&M | Employee injury resulting from a slip, trip, or fall. | Maintain good housekeeping, adequate lighting, compliant stairways, and railings as appropriate. |
| Crane and Derrick Operations | C, O&M | Employee injuries and property damage due to falling loads. | Implement hoisting and rigging safety program. Ensure that operators are properly trained. |
| Hot Work | C, O&M | Employee injuries and property damage due to fire or explosion. | Implement fire protection and prevention program, require Hot Work permits, and ensure that welders, pipe fitters, etc. are properly trained. |
| Working with Flammable and Combustible Liquids | C, O&M | Employee injuries and property damage due to fire or explosion. | Implement fire protection and prevention program that includes proper procedures for the proper storage and use of flammable or combustible liquids. |
| Concrete/Forms Work | C | Employee injuries due to work at height, slips, trips, and falls. | Wear fall protection when working at height, protect exposed rebar, and maintain good housekeeping. |
| Electrical Work | C, O&M | Employee injuries due to contact with energized parts. | Implement energy control program including Lock Out/Tag Out (LO/TO) of energized sources. |
| Materials Handling | C, O&M | Employee injuries due to improper lifting. | Implement an ergonomics program and train employees in proper lifting techniques. |
| Confined Space Entries | C, O&M | Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc. | Implement a confined space program, including permit procedures and air monitoring requirements. |
| Compressed Gas Storage | C, O&M | Employee injuries and equipment damage due to explosive release of pressure. | Implement a compressed gas safety program, including procedures for proper use and storage. |
| Power Tool Use | C, O&M | Employee injuries due to improper use, or use of damaged power tools. | Implement procedures for inspecting power tools before operations and training of employees on the proper use and |

| Table 5.9-4<br>Hazard Analysis<br>KRCDPP | | | |
|---|---|---|---|
| **Activity** | **Exposure Potential*** | **Potential Hazard** | **Proposed Control Strategies** |
| | | | care of power tools. |
| Working with or Near Hazardous or Toxic Materials | C, O&M | Employee injuries due to exposure to hazardous and/or toxic materials. | Implement hazard communication program and exposure control procedures including: engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials. |
| Working with or Near Noisy Equipment | C, O&M | Employee overexposure to noise. | Implement a hearing conservation program to include: identifying high noise activities and sources, sound level monitoring, and PPE. |
| Working with or Near Exposed Machinery | C, O&M | Employee injuries from entanglement in rotating or moving equipment. | Develop and implement machine guarding equipment LO/TO procedures. |
| * C = Construction Phase<br>O&M = Facility Operations and Maintenance | | | |

### *5.9.4.3 Construction*

**Worker Training**

Workers participating in the construction of the proposed KRCDPP will be required to participate in applicable safety training programs designed to protect themselves and others from injuries during KRCDPP construction. All construction personnel will be required to attend a basic site safety orientation training course. Additional training will be required based upon individual job responsibilities. All training courses will be documented and attendance records will be maintained at the local job site. Periodic audits will also be performed by qualified individuals to determine whether proper work practices are being implemented to mitigate hazardous conditions and to evaluate compliance with applicable regulatory guidelines. Table 5.9-5 provides an overview of the training programs that will be available to construction personnel and that will be implemented as applicable.

| Table 5.9-5<br>Construction Training Programs<br>KRCDPP | |
|---|---|
| **Training Course** | **Target Employees** |
| Site Safety Orientation | All |
| IIPP | All |
| Emergency Action Plan | All |
| Heavy Equipment Safety Program | Employees working on, near, or with heavy equipment |
| Forklift Operator Training | Employees working on, near, or with forklifts |
| Trenching and Excavation Safety Program | Employees working in or near trenches or excavations |
| Fall Protection Program | Employees required to work at elevation (>6 feet) |
| Scaffolding Safety Program | Employees required to erect or use scaffolding |
| Hoisting and Rigging Safety Program | Employees responsible for performing and/or supervising hoisting and rigging |
| Crane Safety Program | Employees supervising or performing crane operations |
| Flammable and Combustible Liquid Storage and Handling | Employees responsible for the handling and storage of flammable or combustible liquids or gases |
| Hot Work Program | Employees, including pipe fitters and welders, performing work involving an ignition source |
| Hazardous Energy Control (LO/TO) | Employees performing LO/TO |
| Electrical Safety | Employees required to work on electrical systems and equipment |
| Permit Required Confined Space | Employees required to supervise or perform confined space entry |
| Hand and Portable Power Tool Safety | All |
| Housekeeping Policy and Program | All |
| Hearing Conservation | All |
| Safe Lifting Program | All |
| Safe Driving Program | Employees supervising or driving motor vehicles |
| Hazard Communication | All |
| Pressure Safety | Employees supervising or working on pressurized systems or equipment |
| Line Breaking Safety | Employees performing general maintenance or working on pressurized systems or equipment |
| Respiratory Protection Program | All employees required to wear respiratory protection |
| Fire Prevention Program | All |
| HAZWOPER (Hazardous Work Operations and Emergency Responses)/First Responder | Employees working around hazardous materials or waste |

### Health and Safety Programs

During construction of the proposed KRCDPP, employers will develop and implement the necessary health and safety programs to mitigate the identified workplace hazards and to protect the workers' health and safety. The programs will include the IIPP, Emergency

Action Program, and PPE Program. Draft outlines of these programs are included as Appendix 5.9-1.

### *5.9.4.4 Operation and Maintenance*

**Worker Training**

Workers participating in O&M of the proposed KRCDPP will be required to participate in applicable safety training programs designed to protect themselves and others from injuries while working at the site. Table 5.9-6 provides an overview of the O&M training programs that will be implemented as applicable.

**Table 5.9-6**
**O&M Training Programs**
**KRCDPP**

| Training Course | Target Employees |
|---|---|
| Site Safety Orientation | All |
| IIPP | All |
| Emergency Action Plan | All |
| PPE Program | All |
| Trenching and Excavation Safety Program | Employees performing or supervising work or near trenches or excavations |
| 100% Fall Protection Program | Employees required to use fall protection |
| Hoisting and Rigging Safety Program | Employees responsible for the oversight or conduct of hoisting and rigging |
| Forklift Operator Training | Employees working on, near, or with forklifts |
| Crane Safety Program | Employees supervising or performing crane operations |
| Flammable and Combustible Liquid Storage and Handling | Employees responsible for the handling and storage of flammable or combustible liquids or gases |
| Hot Work Program | Employees, including pipe fitters and welders, performing work involving an ignition source |
| Hazardous Energy Control (LO/TO) | Employees performing LO/TO |
| Electrical Safety | Employees required to supervise or work on electrical systems and equipment |
| Permit Required Confined Space | Employees required to supervise or perform confined space entry |
| Hand and Portable Power Tool Safety | All |
| Housekeeping Policy and Program | All |
| Hearing Conservation | All |
| Safe Lifting Program | All |
| Safe Driving Program | Employees supervising or driving motor vehicles |
| Hazard Communication | All |
| Pressure Safety | Employees supervising or working on pressurized |

| Table 5.9-6<br>O&M Training Programs<br>KRCDPP | |
|---|---|
| **Training Course** | **Target Employees** |
| | systems or equipment |
| Line Breaking Safety | Employees performing general maintenance or working on pressurized systems or equipment |
| Relief Valve Maintenance and Testing | Employees performing maintenance or testing of relief valves |
| Respiratory Protection Program | All employees required to wear respiratory protection |
| Fire Prevention Program | All |
| Fire Protection Plan | All |
| HAZWOPER/First Responder | Employees working with hazardous materials or waste |

**Health and Safety Programs**

Upon completion of construction and commencement of operations of the proposed KRCDPP, the construction health and safety program will become an operations-oriented program focusing on hazards and controls necessary during O&M activities. These O&M programs will include the IIPP, Fire Protection and Prevention Program, Emergency Action Program and PPE Program. Draft outlines of these programs are included as Appendix 5.9-1.

#### *5.9.4.5 Fire Protection*

The Fresno County Fire Protection District (FCFPD) provides fire protection services to the area of the proposed KRCDPP. The Fire Station closest to the KRCDPP is Fire Station 87 - South Fresno, which is located at 4706 E. Drummond Avenue and is located approximately 1.2 miles from the KRCDPP project site. Fire Station #87 would respond to a call from the KRCDPP site in less than 5 minutes (FCFPD, 2003). A draft Fire Prevention Plan is provided in Appendix 5.9-1.

### 5.9.5 Proposed Mitigation Measures

Worker exposure to potential hazards will be minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of PPE, and compliance with the applicable health and safety LORS presented above in Table 5.9-1. No significant unavoidable adverse impacts to worker health and safety are anticipated as result of the proposed KRCDPP. No additional mitigation measures are proposed.

### 5.9.6 Cumulative Impacts

There will be no cumulative impacts on worker health and safety resulting from either construction or O&M activities associated with the proposed KRCDPP.

### 5.9.7 References

California Code of Regulations, Title 8. General Industry Safety Orders, (Chapter 4, Subchapter 7) and Construction Safety Orders (Chapter 4, Subchapter 4).

Code of Federal Regulations, Title 29, Part 26, Health and Safety for Construction, and Title 29, Part 1910, Occupation Safety and Health Standards.

Fresno County Fire Protection District. Fire Station #87. Website at: http://www.fcfpd.org.

GWF, 2000. Application for a Small Power Plant Exemption. Prepared by GWF Power Systems. May 2000.

Modesto Irrigation District, 2003. Administrative Draft Application for a Small Power Plant Exemption. Prepared by CH2M Hill for Modesto Irrigation District. April 14, 2003.

National Fire Protection Association, 2000. A Compilation of NFPA Codes, Standards, Recommended Practices and Guides; Quincy, MA.

# SECTION 5.10 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

## 5.10.1 Introduction

This section discusses the hazardous materials that will likely be handled, used and/or stored at the Kings River Conservation District Peaking Plant (KRCDPP), including an evaluation of the potential environmental and human health effects related to waste generated. Section 5.10.2 describes the area of the proposed KRCDPP. Section 5.10.3 discusses federal, state and local laws, ordinances, regulations and standards (LORS) that are applicable to the proposed KRCDPP. This section also identifies appropriate regulatory agency contacts and permits required. Section 5.10.4 discusses the hazardous materials that will be used and the wastes that will be generated on-site as well as the potential impacts. This section also presents an environmental checklist of possible impacts related to hazardous material use and waste generation resulting from construction, and operation and maintenance (O&M) of the proposed KRCDPP. Section 5.10.5 provides a discussion of measures proposed to mitigate potential impacts and Section 5.10.6 discusses the potential for cumulative impacts.

## 5.10.2 Affected Environment

Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. The KRCDPP is a simple-cycle peaking electrical power generating facility, which will consist of two LM6000 General Electric (GE) natural gas-fired combustion turbine generating units along with supporting equipment and have a total electrical generating capacity of approximately 97 megawatts (MW).

KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections, as described below. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect into the Malaga System at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the sewer system of Malaga Water, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

### *5.10.2.1 Sensitive Receptors*

The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E Malaga Substation located on the northeast intersection of North and Willow Avenues. The nearest of these is approximately 1,100 feet east northeast of the ammonia storage tank located on the KRCDPP project site, as shown on Figure 2.2-2 in Chapter 2, Project and Facility Description.

Numerous other sensitive receptors (including schools, places of worship, hospitals and emergency-response facilities, day-care and long-term health care facilities) are also located within a two-mile radius of the KRCDPP. Information on sensitive receptors was obtained through various computer-mapping programs (including Precision Streets, Topographic USA, and Microsoft Streets/Trips) and was verified through on-line phone book listings. Information on these sensitive receptors, including the approximate distance from the KRCDPP is included below.

**Schools**

The nearest school, the Malaga Elementary School located at 3910 S. Ward, is approximately .62 miles to the southeast of the KRCDPP project site. As shown below in Table 5.10-1, there are a total of 7 schools within an approximately 2-mile radius of the KRCDPP project site.

**Table 5.10-1**
**Schools Located Within 2 Miles of the Project Site**
**KRCDPP**

| School Name | Address | School District | Approximate Distance from KRCDPP[1] |
|---|---|---|---|
| Malaga Elementary | 3910 S. Ward Avenue<br>Fresno, CA 93725-2538 | Fowler Unified | .62 miles |
| Aynesworth Elementary | 4765 E. Burns Avenue<br>Fresno, CA 93725-1732 | Fresno Unified | 1.5 miles |
| Ezekiel Balderas Elementary | 4625 E. Florence<br>Fresno, CA 93725-1110 | Fresno Unified | 1.8 miles |
| Calwa Elementary | 4303 E. Jensen Avenue<br>Fresno, CA 93725-2105 | Fresno Unified | 1.4 miles |

| Table 5.10-1<br>Schools Located Within 2 Miles of the Project Site<br>KRCDPP | | | |
|---|---|---|---|
| **School Name** | **Address** | **School District** | **Approximate Distance from KRCDPP[1]** |
| Edith B. Storey Elementary | 5250 E. Church Avenue<br>Fresno, CA 93725-0900 | Fresno Unified | 2.2 miles |
| Elizabeth Terronez Middle School | 2300 S. Willow<br>Fresno, CA 93725 | Fresno Unified | 1.9 miles |
| Year-Round Achievement Center | 5090 E. Church<br>Fresno, CA 93725 | Fresno Unified | 1.8 miles |
| [1] Source: Microsoft Streets and Trips, 2001 | | | |

### Places of Worship

The nearest house of worship, Jubilee Deliverance Ministries, is located along the north side of North Avenue, east of Chestnut Avenue and approximately 0.4 miles to the northeast of the ammonia storage tank located on the KRCDPP project site. Other houses of worship within a 2 mile radius of the KRCDPP include: Celebration Christian Center located at 3757 South Ward Avenue and .6 miles from the KRCDPP, and Cristo Rey located at 3545 South Calvin Avenue and .6 miles from the KRCDPP.

### Hospitals/Emergency Response Facilities

The nearest hospitals to the KRCDPP are the University Medical Center located at 445 South Cedar Avenue, and approximately 5 miles north of the KRCDPP and the Community Medical Center of Fresno located at Fresno and R Streets and approximately 5.8 miles northwest of the KRCDPP. In addition, Fresno County is served by six ambulance services or agencies for emergency response. American Ambulance is the sole 9-1-1 paramedic ambulance provider for over 4000 square miles of Fresno County and including the area of the KRCDPP. The communications center dispatches every 9-1-1 and non-emergent ambulance request and is located at the northeast corner of Divisadero Street and Freeway 41. The average response time for emergency calls ranges from five to eight minutes (County of Fresno, 2000).

### Long-Term Health and Day Care Facilities

There is one convalescent/long-term care facility located 1.2 miles from the KRCDPP, the Sunnyside Convalescent Hospital located at 2939 South Peach Avenue. The nearest day care facility is In & Out Daycare located at 2240 South Matus Avenue and 1.9 miles from the KRCDPP.

### 5.10.3 Laws, Ordinances, Regulations, and Standards

Applicable federal, state and local LORS that govern the storage, handling and use of hazardous materials and the generation and disposal of wastes are summarized below in Table 5.10-2.

| **Table 5.10-2<br>Summary of Applicable LORS<br>KRCDPP** | |
|---|---|
| **Regulation/Program** | **Description/Project Applicability** |
| **Federal** | |
| Comprehensive Environmental Response, Compensation and Liabilities Act of 1980 (CERCLA or Superfund) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III (also known as the Emergency Planning and Community Right-to-Know Act) (i.e. CERCLA/SARA) | Establishes requirements for facilities regarding reporting on hazardous or toxic chemicals that are used and stored onsite to improve chemical safety and protect public health and the environment. |
| CERCLA/SARA Emergency Planning: Section 301-303 | Designed to develop emergency response and preparedness capabilities through better coordination and planning. |
| CERCLA/SARA Emergency Notification: Section 304 | Requires immediate notification if there is a release of a hazardous substance that exceeds reportable quantities for that substance. |
| CERLCA/SARA Community Right-To-Know Requirements: Section 311&312 | Section 311: Requires preparation of a material safety data sheet (MSDS) for chemicals that are kept on-site and submittal to the Local Emergency Planning Commission (LERC), the State Emergency Response Commission, (SERC) and the local fire department. Section 312: Requires a facility to submit an emergency and hazardous chemical inventory form to the LERC, SERC, and local fire department for hazardous chemicals, which required a MSDS (in compliance with Section 311, above) and are on site in quantities above specified threshold levels. |
| CERCLA/SARA Toxic Chemical Release Reporting: Section 313 | Requires annual reporting of information on routine releases of specified chemical to the environment. |
| Resource Conservation and Recovery Act (RCRA), Title 40 Code of Federal Regulations (CFR) | Regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. |
| Clean Air Act | Regulates air emissions from area, stationary, and mobile sources to protect public health and the environment. Requires a Risk Management Plan (RMP), if listed hazardous materials are stored in excess of specified threshold quantities. |

| Table 5.10-2<br>Summary of Applicable LORS<br>KRCDPP | |
|---|---|
| **Regulation/Program** | **Description/Project Applicability** |
| Clean Water Act (CWA) | Protects the nation's water by restoring and maintaining the water's chemical, physical and biological properties and regulated discharge of wastewater and pollutants into Waters of the United States. |
| CWA: 40CFR Part 112 – Oil Pollution Prevention | Prevents oil discharges from reaching navigable waters of the United States or adjoining shorelines. Requires a Spill Prevention Control and Countermeasure Plan (SPCC) and Facility Response Plan if oil is stored above certain quantities. |
| **State and Local** | |
| California Health and Safety Code, Sections 25100, et. seq. - Hazardous Waste Control Law | Requires a hazardous waster generator who stores or accumulates hazardous wastes for a period of greater than 90 days to obtain a permit for the storage, treatment and disposal of the hazardous waste. |
| California Health & Safety Code, Section 25270 – Aboveground Petroleum Storage Tank Program | This program, which is administered by State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB), requires owners or operators of aboveground petroleum storage tanks to file storage statements, and implement spill prevention measures, including the development of a SPCC. |
| California Health & Safety Code, Section 25500, et. seq. - Hazardous Materials Release Response Plans and Inventory Act (or Business Plan Act) | Requires businesses using hazardous materials to prepare a business plan to protect public health and safety and the environment in connection with the handling and release or threatened release of hazardous materials.<br><br>This Act is not applicable to cities, counties and special districts since they are not considered businesses (Attorney General, 1994); therefore this Act is not applicable to KRCD, which is considered a special district. |
| California Health & Safety Code, Sections 25531-25543.3 – California Accidental Release Prevention (CalARP) Program/California Risk Management and Prevention Program (RMPP) | The purpose of the code is to reduce the frequency of releases of hazardous substances and reduce the consequences in the event a release occurs. Requires registration with the applicable local Certified Unified Program Agency (CUPA) and the preparation of an RMP is hazardous materials are handled or stored in excess of threshold levels. The CUPA for the Project is Fresno County Environmental Health Department |

| Table 5.10-2<br>Summary of Applicable LORS<br>KRCDPP | |
|---|---|
| **Regulation/Program** | **Description/Project Applicability** |
| | (EHD). Fresno County EHD also administers the Hazardous Waste Generator program as well as the Hazardous Materials Business Plan Program and Accidental Release Prevention Program (Cal-ARP). |
| California Code of Regulations, Title 8 – Control of Hazardous Substances | Requires the implementation of Process Safety Management standards for facilities that handle large quantities of hazardous materials to ensure the safe handling of such materials and protection of workers. |
| Porter-Cologne Water Quality Control Act, California Water Code Section 13000 et seq. | The Act controls the discharge of wastewater to surface and groundwater and delegates the control of pollutant discharges to surface and groundwater from the SWRCB to the nine RWQCB's and identifies water quality criteria to protect the state's waters. |
| Uniform Fire Code – Article 80 | Requires the prevention, control, and mitigation of dangerous conditions related to the storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel. Also see Section 5.9, Worker Health and Safety. |
| California Building Code | Includes requirements regarding the storage and handling of hazardous materials – the Chief Building Officer must inspect and verify compliance with these requirements. |
| California Vehicle Code Section 32100.5 | Includes specific regulations regarding materials that may pose an inhalation hazard and licensing requirements for hazardous material haulers. See also Section 5.7, Traffic and Transportation. |

### *5.10.3.1 Required Permits and Agency Contacts*

There are several regulatory agencies responsible for hazardous materials and waste management for the KRCDPP and for implementing the LORS addressed previously in Table 5.10-2. The Fresno County EHD is the CUPA for the KRCDPP. Fresno County EHD also administers the Hazardous Waste Generator program as well as the Hazardous Materials Business Plan Program and Accidental Release Prevention Program (Cal-ARP). Contact information for applicable agencies is provided below in Table 5.10-3. There are no hazardous materials or waste permits required for the KRCDPP.

| Table 5.10-3<br>List of Hazardous Material Agency Contacts<br>KRCDPP | |
|---|---|
| **Agency** | **Phone Number** |
| Fresno County EHD (Project CUPA)<br>1221 Fulton Mall<br>Fresno, CA 93721 | (559) 445-3357 |
| Fresno County Office of Emergency Services<br>1221 Fulton Mall<br>Fresno, CA 93721 | (559) 445-3391 |
| Fresno County Fire Protection District (FCFPD) Fire Station 87 - South Fresno<br>4706 East Drummond Avenue<br>Fresno, CA 93725 | (559) 485-2800 |

## 5.10.4 Environmental Consequences

### *5.10.4.1 Hazardous Materials Inventory – Construction*

Certain hazardous materials would be used during construction of the proposed KRCDPP, including substances such as cleaners, sealers and solvents. These substances would be brought on site in quantities of typically no more than 55 gallons and would be stored and used in accordance with the rules developed by the construction contractor for hazardous materials.

### *5.10.4.2 Hazardous Materials Inventory – O&M*

There would also be hazardous materials used and/or stored onsite during O&M of the proposed KRCDPP. These materials, which are typical for similar facilities, include materials such as solvents and hydraulic and lubricating oils for the operation of the combustion turbines. Aqueous ammonia will also be used onsite to control oxides of nitrogen (NOx) emissions through selective catalytic reduction (SCR). Table 5.10-4 includes a list of hazardous materials that would be used onsite during operation of the proposed KRCDPP, as well as their compositions, uses, quantities, storage and methods/frequencies of delivery.

| Table 5.10-4<br>Hazardous Materials Used Onsite – O&M<br>KRCDPP | | | | |
|---|---|---|---|---|
| **Material/ Chemical Name** | **Use** | **Maximum On-Site Quantity** | **Location/Storage Area** | **Mode/ Frequency of Delivery** |
| Aqueous Ammonia (29.4 % solution) | Control of NOx Emissions | 10,000 Gallons | Tank inside Secondary Containment | Truck/ Semi-monthly |
| Anti-Scalant Nalco PC510 or equal | Water Treatment | 50 Gallons | Water Treatment Area | Truck/Semi-Yearly |
| Cleaning Chemicals | Periodic Cleaning (e.g., Turbine Compressor) | 10 Gallons | Warehouse | Truck/Monthly |
| Synthetic Lubrication Oil | Turbine Bearing Lubrication | 450 Gallons | Contained within Equipment/ Warehouse | Truck/Yearly |
| Mineral Lubrication Oil | Generator Bearing Lubrication | 1,200 Gallons | Contained within Equipment/ Warehouse | Truck/Yearly |
| Hydraulic Oil | Lubrication of Starting System | 150 Gallons | Contained within Equipment/ Warehouse | Truck/Semi-Yearly |
| Mineral Insulating Oil | Lubrication of Transformers | 10,000 Gallons | Contained within Equipment | Not required |
| Scale/Corrosion Inhibitors | Water Treatment | 280 Gallons | Storage Area Near Cooling Towers | Truck/Monthly |
| Sodium Hydroxide | Water Treatment | .50 Gallons | Water Treatment Area | Truck/Monthly |
| Sulfuric Acid | Water Treatment Area, Cooling Tower pH Control | 450 Gallons at each location | Water Treatment Area, Storage Area Near Cooling Towers | Truck/Monthly |
| Propylene Glycol | Chiller System Working Fluid | 50 Gallons | Warehouse | Truck/Semi-Yearly |
| Laboratory Reagents | Laboratory Analysis | Up to 5 Gallons and 10 lbs | Lab Area | Truck/Bi-Monthly |
| Sodium Bromide | Water Treatment | 280 Gallons | Cooling Tower Treatment Area | Truck/Monthly |
| Anti Foam Nalco 7468 or equal | Water Treatment | 55 Gallons | Water Treatment Area | Truck/Semi-Yearly |
| Calcium Chloride | Water Treatment | 1000 Gallons | Water Treatment Area | Truck/Bi-Monthly |

| Table 5.10-4<br>Hazardous Materials Used Onsite – O&M<br>KRCDPP | | | | |
|---|---|---|---|---|
| **Material/ Chemical Name** | **Use** | **Maximum On-Site Quantity** | **Location/Storage Area** | **Mode/ Frequency of Delivery** |
| Sodium Bisulfite | Water Treatment | 55 Gallons | Water Treatment Area | Truck/Semi-Yearly |
| Calcium Hypochlorite | Water Treatment | 55 Gallons | Cooling Tower Treatment Area | Truck/Semi-Yearly |
| Sodium Molybdenate | Water Treatment | 55 Gallons | Cooling Tower Treatment Area | Truck/Semi-Yearly |
| Propylene Glycol | Chilled Water Supply | 55 Gallons | Warehouse | Truck/Yearly |

### *5.10.4.3 Waste Generation Inventory*

As previously described, KRCD is proposing to use a ZLD system to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. KRCD is currently considering two onsite ZLD technologies and one offsite ZLD technology. The first option for onsite ZLD technology will have a small solid residual. The second onsite option will have a small slurry residual. Both options will require periodic removal of the residues by truck. The offsite ZLD technology will have no residuals, but the treatment system will require periodic replacement as the treatment system depletes.

There will be wastes produced as a result of construction and O&M of the proposed KRCDPP. Table 5.10-5 includes a summary of the wastes produced as well as the proposed methods of disposal.

| Table 5.10-5<br>Waste Generation and Management<br>KRCDPP | | | |
|---|---|---|---|
| **Source of Waste** | **Description/Composition** | **Quantity Generated** | **Disposal Method** |
| Construction | Debris – e.g., Wood, Concrete, Metal | 50 Cubic Yards/Month | Transported to offsite Landfill |
| Emissions Control System | Spent SCR and Oxidation Catalyst Blocks | Varies – partial catalyst replacement approximately every 3-5 Years | Recycled to catalyst suppliers |
| ZLD System | Process Waste | Liquids 20,000 Gallons/Year or Solids 21 Tons/Year | Transported to offsite landfill or treatment facility |

| Table 5.10-5<br>Waste Generation and Management<br>KRCDPP | | | |
|---|---|---|---|
| **Source of Waste** | **Description/Composition** | **Quantity Generated** | **Disposal Method** |
| Sanitary Drains | Sanitary Waste | 50,000 Gallons/Year | MCWD Sewer System |
| Closed Loop Cooling (Chiller) System | Propylene Glycol | 500 Gallons/Year | Transferred to/from drums and transported offsite for Recycling |
| Wastewater System | Miscellaneous Drains | 100,000 Gallons/Year | MCWD Sewer System |
| Equipment Lubrication Systems | Waste Oils | Not routinely generated | As required, transferred to/from drums and transported off-site for recycling |
| Transformers | Waste Oil | Not Routinely Generated | As required, transferred to/from to drums and transported off-site for recycling |
| Fuel Gas System | Blowdown Oils | 50 Gallons/Month | Periodic accumulation of oils in fuel gas filters. Transported off-site for recycling |
| Municipal Solid Waste | Debris – e.g., Paper, Plastic, Food | 20 Cubic Yards/Month | Transported to offsite landfill |

### Non-Hazardous Waste Disposal

Nonhazardous solid wastes (or solid waste, municipal solid waste or garbage) generated as a result of the KRCDPP will be recycled or disposed of in an approved Class III landfill. Fresno County currently operates two active solid waste disposal facilities, or Class III landfills, these are the American Avenue Landfill and the Coalinga Landfill. These landfills serve 6,000 square miles, with a population of 760,900 people (ESA, 2003). The American Avenue Landfill has been established as the regional landfill in Fresno County and only accepts standard municipal waste. The landfill has a total capacity of 41.1 million cubic yards and handles on average 1,700 tons per day. As of January 1997, the landfill was at eight percent of capacity with a life expectancy of approximately 32 to 40 years (County of Fresno, 2000). The Coalinga Landfill is located at 30825 Lost Hills Road in Coalinga, receives approximately 37 to 38 tons per day, and has a capacity of approximately 3.3 million cubic yards. The landfill has a life expectancy of approximately 40 years (County of Fresno, 2000).

Portions of the unincorporated areas of Fresno County also use the Clovis Landfill and the Orange Avenue Landfill. The MCWD, who manages solid waste collection services through a private hauler, provides solid waste services to the area of the proposed KRCDPP. The Fresno County Planning & Resource Management Department provides solid waste coordination and solid waste disposal activities outside of the MCWD service boundaries (ESA, 2003).

**Hazardous Waste Disposal**

Any hazardous wastes generated as a result of the proposed KRCDPP will be disposed of at an approved Class I landfill. The closest commercial hazardous waste facility to the KRCDPP is Chemical Waste Management Incorporated's Kettleman Hills Landfill. This landfill is located approximately three miles from the Town of Kettleman City in Kings County. Kettleman Hills accepts Class I, II and III wastes and has no capacity restrictions. The current annual deposit rate is approximately 200,000 cubic yard per year. The life expectancy of the landfill is expected to be at least 25 years. Kettleman Hills accepts virtually all solid, semisolid and liquid hazardous wastes, with the exception of biological agents, infectious wastes, radioactive materials, compressed gases and explosives (DTSC, 2003).

Other Class I landfills include Safety-Kleen's Buttonwillow Landfill, which is located in Kern County and accepts both non hazardous waste and is permitted as a Class I landfill.

### *5.10.4.4 Environmental Checklist*

Table 5.10-6 is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the California Energy Commission (CEC) to assess the potential for significant impacts associated with hazardous materials or waste management.

**Table 5.10-6**
**CEQA Environmental Checklist – Hazardous Materials and Waste Management**
**KRCDPP**

| HAZARDOUS MATERIALS AND WASTE MANAGEMENT – Would the project: | Potentially Significant Impact | Less Than Significant With Mitigation | Less Than Significant | No Impact |
|---|---|---|---|---|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | | X | | |

| Table 5.10-6<br>CEQA Environmental Checklist – Hazardous Materials and Waste Management<br>KRCDPP | | | | |
|---|---|---|---|---|
| **HAZARDOUS MATERIALS AND WASTE MANAGEMENT – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| b) Create a significant hazard to the public<br>or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | | X | | |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | | | | X |
| 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? | | | | X |
| 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? | | | | X |
| 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? | | | | X |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | | | X | |
| 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 | | | | X |

| Table 5.10-6<br>CEQA Environmental Checklist – Hazardous Materials and Waste Management<br>KRCDPP | | | | |
|---|---|---|---|---|
| **HAZARDOUS MATERIALS AND WASTE MANAGEMENT – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| intermixed with wildlands? | | | | |
| i) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? | | | X | |
| j) Comply with federal, state, and local statutes and regulations related to solid waste? | | | X | |

### *5.10.4.5 Hazardous Materials – Potential Impacts*

**Construction**

Relatively few hazardous materials will be used during the construction phase of the proposed KRCDPP. The construction contractor will incorporate procedures into its work rules that ensure these materials are stored and applied in accordance with their specified uses and stored in a way that prevents their migration into the environment. Therefore, the use of hazardous materials during KRCDPP construction is expected to result in a less than significant impact to the environment.

**O&M**

The hazardous materials to be used during KRCDPP O&M are listed in Table 5.10-5. The transportation and use of these hazardous materials is not anticipated to result in any significant impacts, since all of these materials are commonly transported to and in use at similar and other facilities throughout the state. Periodic deliveries of these materials to the KRCDPP project site will be accomplished primarily by trucks, which have been designed and built to minimize any release of material in the event of a vehicle accident during transportation.

All hazardous materials will be stored in containers, tanks or pressure vessels, which have been designed and built in accordance with the requirements of applicable LORS and fire and safety codes. Secondary containment will be provided and hazardous materials will be stored together, as feasible, to reduce the number of storage locations. However, incompatible materials will be segregated, and the KRCDPP's operating plans and procedures will include emergency response procedures for each hazardous substance.

During normal KRCDPP operations, there will be no releases of hazardous materials. However, accidental (emergency) releases are possible. While any release of most of the hazardous materials used by the KRCDPP would be contained on-site, the hazardous material with the greatest potential to migrate off-site is ammonia.

The KRCDPP will use aqueous ammonia, i.e., an ammonia/water solution that consists of approximately 29% ammonia and 71% water. The aqueous ammonia will be stored in an enclosed tank, which will be connected by piping to the SCR emissions control equipment. The design of the storage tank and piping will include safety features that will reduce the potential for accidental releases of ammonia.

A release or spill of aqueous ammonia would form a pool and evaporate over time into the air. At relatively low concentrations, ammonia vapor does not pose a threat, e.g., the odor threshold of ammonia is approximately 5 parts per million (ppm) and irritation of the nasal passages and throat is noticeable at 30 to 50 ppm. However, at high concentrations, i.e., greater than 2,000 ppm, ammonia gas can result in severe injury or death. Because of this, emergency release modeling was performed, as described below, to assess possible impacts from the accidental release of some or all of the aqueous ammonia stored on-site.

**Aqueous Ammonia – Emergency Release Modeling**

Two emergency release scenarios were evaluated to predict the downwind concentrations of ammonia and to assess the extent of the toxicity of the release. Aqueous ammonia would be stored in a 10,000-gallon horizontal aboveground storage tank. The complete failure of the main storage tank into a diked area was designated as the worst-case scenario. The alternate, more-likely scenario would be leakage from the delivery truck hose. This release would be into a catch basin.

Emissions from each scenario were calculated. The methodology contained in Risk Management Program Guidance for Wastewater Treatment Plants (Code of Federal Regulations (CFR) 40 Part 68 (USEPA, 2000) and the Risk Management Program Guidance for Offsite Consequence Analysis (USEPA, 1999) were used to calculate emissions. The wastewater treatment plant document contains data specific to aqueous ammonia releases. This document also discusses appropriate emission calculations for worst-case and alternative scenarios.

Meteorological conditions used in calculation of the emissions and concentration calculations varied with each scenario. For the worst-case scenario, following U.S.

Environmental Protection Agency (USEPA) guidance (USEPA, 1999, 2000) a wind speed of 1.5 meters/second (m/sec) and Pasquill-Gifford stability class F (most stable) were used. For the alternative scenario, a wind speed of 3 m/sec, and stability class D (neutral stability) were used. Table 5.10-7 summarizes the meteorological parameters used in these analyses.

**Table 5.10-7**
**Meteorological Data Used In Emergency Release Modeling**
**KRCDPP**

| Meteorological Parameter | Worst-Case Scenario | Alternative Scenario |
|---|---|---|
| Wind Speed (m/sec) | 1.5 | 3.0 |
| Stability Class | F (6) | D (4) |
| Ambient Temperature in degrees Fahrenheit ($^{o}$F) | 81 | 81 |
| Relative Humidity (%) | 50 | 50 |

For the worst-case scenario, a pool of 10,200 gallons of aqueous ammonia, the maximum amount to be stored on-site, was assumed to fill the diked area. The size of this area would be 17 feet by 27 feet (459 square feet). Two tank saddles occupy 10 square feet each, so the net area would be 439 square feet. The temperature of the solution was assumed to be 81$^{o}$F (27 degrees Celsius ($^{o}$C)), the average temperature of the hottest month over the last 30 years in Fresno. The diked area could contain the entire volume of the tank. Following USEPA guidance (2000) for 30% by weight solutions of aqueous ammonia within a diked area, and corrected for temperatures over 25$^{o}$C the rate of evaporation would be 17 pounds per minute.

For the alternative scenario, 4.1 gallons of aqueous ammonia spilled into the delivery truck unloading catch basin trough of 100 square feet. The loss of 4.1 gallons was based on the volume of a 2 inch internal diameter hose of 25 feet in length. However, assuming a 1 centimeter pool depth, the pool area would be less than 20 square feet, which is smaller than the catch basin trough area. The RMP*Comp program (version 1.07) (EPA, 2001) can be used to estimate the emissions from this type of release. For a 30% weight solution with the liquid temperature at 81$^{o}$F, the alternative scenario evaporation rate would be 0.9 pounds per minute. Table 5.10-8 summarizes the parameters used to develop the emissions rates for both release scenarios.

| Table 5.10-8<br>Parameters Used In Calculation Of Evaporation Rates For Emergency Release Modeling<br>KRCDPP | | |
|---|---|---|
| | **Worst-Case Scenario** | **Alternative Scenario** |
| Spill amount (in gallons) | 10,200 | 4.1 |
| Dike area (in square feet) | 439 | 100 |
| Uncontained spill area (in square feet) | 41,560[1] | 16.7[2] |
| Ammonia weight percent | 30 | 30 |
| Release temperature (in $^{o}$F) | 81 | 81 |
| Evaporation rate (in pounds per minute) | 17.07 | 0.91 |

[1] The spill would be contained within the dike. Therefore, the diked area (439 square feet), rather than the uncontained spill area, was used in the calculation of the evaporation rate.

[2] The uncontained spill area would be smaller than the diked area. Therefore, this uncontained spill area, assuming a 1 centimeter depth of aqueous ammonia, was used in the calculation of the evaporation rate.

The SLAB model (Ermak, 1990) was used to assess the distances from the evaporating pools to toxic thresholds for ammonia under the worst-case and alternative scenarios. The CEC de minimus level of 75 ppm and the toxic endpoint level for the USEPA Offsite Consequence Analysis (USEPA, 1999) of 200 ppm were the endpoints evaluated in this analysis. The material properties for ammonia listed in the SLAB manual were input to the model along with the calculated evaporation rate. The emissions were assumed continuous over a 60-minute averaging time. Table 5.10-9 lists the variables input to the SLAB model.

| Table 5.10-9<br>SLAB Model Input Parameters For Emergency Release Modeling<br>KRCDPP | | | |
|---|---|---|---|
| **Modeling Variable** | **Name** | **Worst-Case Scenario** | **Alternative Scenario** |
| Release gas properties | | | |
| Molecular weight of source gas (kilograms (k)) | Wms | 1.70E-02 | 1.70E-02 |
| Vapor heat capacity, constant pressure (joule per kilogram degrees Kelvin (j/kg-k) | Cps | 2.17E+03 | 2.17E+03 |
| Temperature of source gas (k) | Ts | 2.40E+02 | 2.40E+02 |
| Density of source gas (in kilograms per cubic meter (kg/m3) | Rhos | 8.65E-01 | 8.65E-01 |
| Boiling point temperature | Tbp | 2.40E+02 | 2.40E+02 |
| Liquid mass fraction | cmed0 | 0.00E+00 | 0.00E+00 |
| Liquid heat capacity (j/kg-k) | Cpsl | 4.29E+03 | 4.29E+03 |

| Table 5.10-9<br>SLAB Model Input Parameters For Emergency Release Modeling<br>KRCDPP | | | |
|---|---|---|---|
| **Modeling Variable** | **Name** | **Worst-Case Scenario** | **Alternative Scenario** |
| Heat of vaporization (j/kg) | Dhe | 1.37E+06 | 1.37E+06 |
| Liquid source density (kg/m3) | Rhosl | 6.83E+02 | 6.83E+02 |
| Saturation pressure constant | Spa | 1.03E+01 | 1.03E+01 |
| Saturation pressure constant (k) | Spb | 2.13E+03 | 2.13E+03 |
| Saturation pressure constant (k) | Spc | -3.30E+01 | 3.30E+01 |
| Spill Characteristics | | | |
| Spill type | Idspl | 1 | 1 |
| Mass source rate (kilograms per second) | Qs | 1.29E-01 | 6.85E-03 |
| Continuous source duration (second) | Tsd | 3.60E+03 | 3.60E+03 |
| Source area (meter (m)2) | As | 4.08E+01 | 1.55E+00 |
| Vertical vapor velocity (m/s) | Ws | 3.66E-03 | 5.10E-03 |
| Source height (m) | Hs | 0.00E+00 | 0.00E+00 |
| Field Parameters | | | |
| Concentration averaging time (s) | tav = | 3.60E+03 | 3.60E+03 |
| Maximum downwind distance (m) | Xffm = | variable | variable |
| Concentration measurement height | Zp(1)= | 1.50E+00 | 1.50E+00 |
| Ambient Metereological Properties | | | |
| Ambient measurement height (m) | Za | 1.00E+01 | 1.00E+01 |
| Ambient wind speed (m/s) | Ua | 1.50E+00 | 3.00E+00 |
| Ambient temperature (k) | Ta | 3.00E+02 | 3.00E+02 |
| Relative humidity (percent) | Rh | 5.00E+01 | 5.00E+01 |
| Atmospheric stability class value | Stab | 6.00E+00 | 4.00E+00 |
| Surface roughness height (m) | z0 | 1.00E-02 | 1.00E-02 |
| Additional Parameters | | | |
| Sub-step multiplier | Ncalc | 1 | 1 |
| Source: (Ermak, 1990)<br>[1] Names are as defined in the SLAB Model. | | | |

For the worst-case release scenario, the ammonia concentration would fall below 75 ppm approximately 49 feet (15 meters) downwind from the center of the diked area. The toxic endpoint of 200 ppm would be reached 48 feet (14.6 meters) downwind from the center of the bermed area. The closest project site fence line is located approximately 110 feet (34 meters) to the west of the ammonia source center.

For the alternative scenario, the ammonia concentration would fall below 75 ppm approximately 176 feet (53.7 meters) downwind from the center of the spill. The toxic endpoint of 200 ppm would be reached 89 feet (27.2 meters) downwind from the center of the spill. While the plume concentration would exceed the CEC de minimus level of

75 ppm outside of the project site fence line, the 200 ppm threshold would fall within the project site fence line. The area, which is beyond the project site fence line and could potentially be exposed to a concentration of more than 75 ppm, is located directly to the west of the ammonia storage tank location. This area is uninhabited and unused. There are no sensitive receptors in or near this area, which consists of an open field with derelict concrete foundations. Therefore, it is reasonable to conclude that there will be no significant off-site impacts from an accidental release of aqueous ammonia. The SLAB results for both release scenarios are summarized in Table 5.10-10. More detailed modeling information is provided in Appendix 5.10-1.

**Table 5.10-10**
**Summary of SLAB Emergency Release Modeling:**
**Distance To Toxic Endpoints**
**KRCDPP**

| | **Worst-Case Scenario** | | **Alternative Scenario** | |
|---|---|---|---|---|
| | **75 ppm** | **200 ppm** | **75 ppm** | **200 ppm** |
| Distance (meters) | 15.03 | 14.62 | 53.66 | 27.22 |

### *5.10.4.6 Waste Management – Potential Impacts*

As shown above in Table 5.10-5, the various waste materials generated during KRCDPP O&M will be recycled or disposed off-site. Hazardous waste produced by the KRCDPP will be transported by a licensed hazardous waste transporter and recycled, as feasible, or disposed of at a licensed hazardous waste disposal facility. During the KRCDPP's construction phase there will be activities that generate waste materials. However, construction wastes, e.g., cleaning solvents, excess paints, general debris, will be of a temporary nature and will disposed of by the construction contractor(s) in an appropriate manner. Therefore, the potential impacts to waste management from the KRCDPP will not be significant.

### Phase 1 Environmental Assessment

Professional Services Industries, Inc. (PSA) performed a Phase I Environmental Site Assessment (Phase I), which included the KRCDPP project site, in May 2003. The Phase I study area included 28 acres of property, which is referred to as the Truck Shop located at 2635 East North Avenue, in Fresno County, California 93725. The larger 28-acre study area includes the approximately 19 acre parcel that KRCD has an option to purchase, which includes the 9.5 acre project site and 9.5 acre parcel north of the project site. The Phase I revealed no evidence of a recognized environmental condition either on the 28-acre parcel or on any off-site property that was considered in the evaluation. The recommendations of the Phase 1 included:

- No further assessment of recognized environmental conditions appears to be warranted.
- Based on the age of the structures located on the northwest portion of the Phase I study area (which includes a truck maintenance shop and two warehouses), it is recommended, that prior to any demolition or renovation activities, a comprehensive asbestos survey should be conducted and all confirmed asbestos containing material that will be affected should be properly abated. These buildings are not part of KRCDPP or the project site and will not be impacted by the KRCDPP.

KRCD has also received a third party reliance letter from PSA, so that KRCD may rely on the results of the Phase I that was originally prepared for another party. A copy of the Phase I and reliance letter are included as Section 5.5, Land Use Appendix 5.5-2.

### 5.10.5 Proposed Mitigation Measures

The proposed KRCDPP will include a number of design features to reduce the likelihood and minimize the impacts of inadvertent release of hazardous materials. All hazardous materials will be stored on-site in tanks or other containers, which are approved for such use. Materials that are incompatible will be stored separately. Storage areas, containers and piping, which are potentially subject to hazards from vehicles, will be shielded by traffic barriers. The KRCDPP will also include a fire suppression system, which would be activated in the case of fire at or near the hazardous materials storage locations. Some form of secondary containment (e.g., berms, dikes, curbs or sumps) will be used to ensure that any leaks are not allowed to migrate to other KRCDPP areas or soils/water bodies. Hazardous wastes generated by the KRCDPP will be stored separately and picked up by hazardous waste recyclers/transporters for final disposition off-site. The KRCDPP will implement a safety program during both its construction and O&M phases. This program will provide practices and procedures for safe operation (construction), implementation of emergency responses and the use of personnel protective equipment. Safety programs are described further in 5.9, Worker Health and Safety.

As required for air emissions control, the KRCDPP will need to store ammonia on-site. To mitigate potential impacts from an emergency release of ammonia, aqueous rather than anhydrous ammonia will be used. The ammonia storage tank will be enclosed by a secondary containment structure (e.g., concrete berm) to ensure that any loss of tank contents will be prevented from migrating beyond this secondary containment area. The unloading area for the ammonia delivery truck will have a sloped area leading to a sump to catch and hold any spills that may result during the transfer of ammonia.

In connection with the KRCDPP's use and storage of ammonia, an RMP will be prepared and submitted to Fresno County prior to the introduction of ammonia on-site. Preparation of an RMP is required per the California Health & Safety Code (Sections 25531 and 25541) and 40 CFR Part 68 for acutely hazardous materials. In addition to the Off-site Consequence Analysis contained in this section, the RMP will include a seismic assessment, an emergency response plan and a process hazards analysis as well as procedures for training personnel.

### 5.10.6 Cumulative Impacts

The most likely potential cumulative impact resulting from the KRCDPP's use of hazardous materials would be a simultaneous off-site release by the KRCDPP and one or more other users of hazardous materials such that the combined impacts overlapped at some off-site point and thereby resulted in an exposure to the public that was significantly greater than the impact resulting from an off-site release by the KRCDPP alone. The hazardous material with the greatest likelihood of migrating off-site in the event of an emergency release is aqueous ammonia. However, the use of aqueous ammonia by the KRCDPP should not result in a significant cumulative impact. Any releases of ammonia would be atypical events, i.e., extremely rare and of short duration. Based on statistics provided in other power plant applications to the CEC, ammonia (all forms) averages 0.017 accidental releases per process per year, and 0.018 accidental releases per million pounds stored per year (MID, 2003). The most likely event, on-site (delivery truck) loading line failure, averages 0.005 accidental releases per process per year. The duration of an emergency release would be on the order of one hour or less. Given the nature of an emergency release, it is highly unlikely that its impacts would overlap with those from an emergency release by other hazardous materials users in the vicinity of the KRCDPP.

As noted above, the only off-site impact from an emergency release of ammonia by the KRCDPP would result from the delivery truck hose failure scenario. The only off-site area potentially exposed to a concentration of more than 75 ppm (but less than 200 ppm) from this event would be immediately adjacent to the western fence line of the project site and out to a distance of no more than approximately 65-75 feet from the fence line. An examination of aerial photographs of the project site area as well as a visual inspection showed there are no other facilities within this zone. Fresno County EHD, which maintains a list of users of extremely hazardous materials (ammonia is classified as an extremely hazardous material) confirmed there are no users of ammonia within this off-site area. The closest user of ammonia appears to the ADM/Packaged Oils Facility, which is located at 3390 South Chestnut and uses ammonia for a cold storage facility.

Since this facility is approximately 2,000 feet to the southeast of the KRCDPP's ammonia storage equipment, there is no likelihood of simultaneous releases of ammonia from the KRCDPP and the ADM facility resulting in a cumulative impact at a location that is outside of the KRCDPP fence line**.**

### 5.10.7 References


Attorney General, 1994. Opinion related to the applicability of the Hazardous Materials Release Response Plans and Inventory Act to cities, counties and special districts. Opinion No. 94-602, October 6, 1994.

California Health and Safety Code. Website at: http://www.leginfo.ca.gov.htm.

County of Fresno, 2000. County of Fresno General Plan Final Environmental Impact Report. August 2000. Fresno County Staff.

Department of Toxic Substance Control (DTSC), 2003. Website at: http://www.dtsc.ca.gov/HazardousWaste/CWMI_Kettleman/FS_CWMI_Kettleman_Permit_Renewal_09-01.pdf

Ermak, Donald L. 1990. User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-than-Air Releases. Lawrence Livermore National Laboratory. URCL-MA-105607. June.

ESA, 2003. Draft Proposed Malaga City Incorporation. Program Environmental Impact Report. June 13, 2003.

Microsoft Streets and Trips, 2001. Copyright 1988-2000 Microsoft Corporation and its suppliers. Website at: http://www.microsoft.com/Streets.

Modesto Irrigation District (MID), 2003. Administrative Draft –Modesto Electric Generation Station Small Power Plant Exemption Application. Prepared for MID by CH2M Hill. April 14, 2003.

Piearcy, T., 2003. Telephone conversation with Ted Piearcy, Environmental Planner, Fresno County Environmental Health System, July 17, 2003.

State of California. Aboveground Tank Program. Website at: http://www.swrcb.ca.gov/rwqcb1/Program_Information/abovegt.html.

United States Environmental Protection Agency (USEPA)

USEPA, 2001. RMP*Comp program. Website at: http://yosemite.epa.gov/oswer/CeppoWeb.nsf/content/rmp-comp.htm

USEPA, 1993. SARA Title III Fact Sheet. Website at: http://www.lepc-len.org/sara/index.htm

USEPA. Information on CERCLA. Website at: http://www.epa.gov/superfund/action/law/cercla.htm

USEPA. Information on RCRC. Website at: http://www.epa.gov/region5/defs/html/rcra.htm

USEPA. Information on Clean Air Act. Website at: http://www.epa.gov/region5/defs/html/caa.htm

USEPA. Information on Clean Water Act. Website at: http://www.epa.gov/region5/water/cwa.htm.

# SECTION 5.11 GEOLOGIC RESOURCES AND HAZARDS

## 5.11.1 Introduction

This section evaluates the geologic hazards and resources that could impact the proposed Kings River Conservation District Peaking Plant (KRCDPP). The objective of this analysis is to evaluate these impacts and how they may affect construction or operations. Section 5.11.2 describes the existing environment that could be affected by the proposed KRCDPP, including a description of the geologic setting and hazards. Section 5.11.3 discusses the relevant federal, state, and local laws, ordinances, regulations and standards (LORS). Section 5.11.4 assesses the potential for adverse impacts to geologic resources and hazards resulting from construction of the proposed KRCDPP. Proposed mitigation measures are discussed in Section 5.11.5.

## 5.11.2 Affected Environment

Kings River Conservation District (KRCD) is developing the KRCDPP. The KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno near the Community of Malaga, in Fresno County. Fresno County lies within the east-central part of the San Joaquin Valley of the Great Valley geomorphic province. Coalescing alluvial plains and fans are dominant geomorphic features in this region (USGS, 1969).

The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections, as described below. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and

Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect into the MCWD system at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

### *5.11.2.1 Regional Geology*

The Great Valley is a 400-mile-long, elongated basin that extends longitudinally from the Tehachapi Mountains in the south to the Klamath Mountains in the north. It lies between the Sierra Nevada on the east and the Coastal Ranges on the west.

The basin is a structural trough with a maximum depth of 30,000 feet on the western part of the valley. This structural trough formed during the mountain building events that formed the Sierra Nevada and the Coastal Ranges. It is filled with consolidated Cretaceous marine deposits and unconsolidated Tertiary lacustrine and continental and

Quaternary alluvial deposits. These deposits generally dip from the east and west toward the central axis.

### *5.11.2.2 Local Geology*

Fresno County is bounded on the north and south by the San Joaquin and Kings Rivers, respectively. It is bounded on the east by the Sierra Nevada and on the west by the Coastal Ranges. The KRCDPP project site is located in central Fresno County at an elevation of about 290 feet above mean sea level (USGS, 1969). The topography surrounding the site is relatively flat and slopes gently to the southeast (USGS Map, 1981). Figure 5.11-1 shows the geology within the KRCDPP project area.

### *5.11.2.3 Stratigraphy*

The KRCDPP project site lies on the Kings River alluvial fan, which consists of unconsolidated, interbedded clays, silts, sands, and gravels of varying thicknesses (USGS, 1997). The unconsolidated deposits consist of 5 distinct stratigraphic units derived from sources in the Sierra Nevada during the Quaternary and Tertiary deposits (USGS, 1969). These units include the Quaternary glacial outwash deposits of the Modesto, Riverbank, and Upper and Lower Turlock Lake Formations and pre-glaciation deposits of the Tertiary Mehrten Formation (USGS, 1969; Wagner et al., 1990; Weissmann, et al., in press). The depositional environment for the Modesto Formation differs from the depositional environment for the other stratigraphic units in that the climate was drier and sediments were deposited into a rapidly aggrading incised channel. The Riverbank, Upper and Lower Turlock, and Mehrten Formations were deposited during wetter climatic periods on open fan environments (Weissmann, et al., in press).

#### Quaternary Modesto Formation

The Modesto Formation is an alluvial fan deposit consisting of discontinuous clay and silt lenses with interbedded sand derived from sources in the Sierra Nevada. Its thickness ranges from 50 to 100 feet (Weissmann, et al., in press).

#### Quaternary Riverbank Formation

The Riverbank Formation is a 150- to 200-foot-thick alluvial fan deposit with sediments similar to those of the Modesto Formation. The source of the sediments is the Sierra Nevada.

#### Quaternary Upper and Lower Turlock Lake Formations

The Turlock Lake Formation consists of non-marine sandstone, siltstone, and conglomerate derived mainly from the Sierra Nevada. The thickness of the formation ranges from 350 to 800 feet. A regional clay layer, the Corcoran clay, is part of this

formation (USGS, 1994). It is present in the western portion of Fresno County, but not beneath the proposed KRCDPP.

**Tertiary Mehrten Formation**

The Mehrten Formation contains non-marine partially to fully cemented agglomerate, conglomerate, tuffaceous sandstone, and siltstone, which are derived from volcanic sources. The formation also contains some volcanic mudflows and ranges in thickness from 800 to 1,200 feet.

### *5.11.2.4 Seismicity*

**Regional Seismicity**

Although it lies between seismically active areas of the Sierra Nevada foothills and the Coastal Ranges (Fresno County, 2000), the Great Valley is considered to be seismically stable. The Owens Valley and Sierra Foothills fault systems lie on the east side of Fresno County and the San Andreas Fault zone occurs on the west. The White Wolf fault zone occurs at the southern end of the San Joaquin Valley (Jennings, 1994). Figure 5.11-2 shows the locations of these faults in relation to the proposed KRCDPP. Figure 5.11-3 shows the probabilistic seismic hazards in the area of the proposed KRCDPP.

The most recent seismic activity in the vicinity of the KRCDPP was the 1983 Coalinga earthquake, which registered a 6.7 magnitude on the Richter Scale. The earthquake is believed to be associated with an old fault zone between the Sierra Nevada and Coastal Ranges. However, there are no apparent surface features or ground ruptures to indicate the presence of this fault (Mualchin, 1996). Following this earthquake, an aftershock with a 5.5 magnitude occurred on the Nunez fault.

**Local Seismicity**

A number of faults and potentially active faults occurring along the eastern and western boundaries of Fresno County have the potential of producing high-magnitude earthquakes (Fresno County, 2000). However, there are no active faults with the potential for ground rupture (i.e., defined Alquist-Priolo Special Fault Study Zones) within Fresno County (Fresno County, 2000). The KRCDPP project site is located in Seismic Zone 3 of the 1999 Uniform Building Code (UBC). Active and potentially faults nearest to the proposed KRCDPP are shown in Table 5.11-1.

| Table 5.11-1<br>Active and Potential Faults<br>KRCDPP | | |
|---|---|---|
| **Fault System** | **Approximate Distance and Direction from the KRCDPP** | **Alquist-Priolo Special Study Area** |
| Clovis[1] | 14 miles northeast | No |
| Ortigalita | 65 miles northwest | Yes |
| Coalinga[2] | 63 miles southwest | No |
| Nunez | 50 miles southwest | Yes |
| San Andreas | 65 miles southwest | Yes |
| White Wolf | 115 miles south | Yes |
| Pond Poso | 72 miles south | Yes |
| Owens Valley | 88 miles east | Yes |

[1]Inferred Fault
[2]Blind thrust Fault between Coastal Ranges and Sierra Nevada
Source: Fresno County, 2000

Maximum credible earthquakes and peak site acceleration for the major faults systems will be addressed in a site-specific geotechnical report, to be prepared prior to construction of the proposed KRCDPP.

### *5.11.2.5 Groundwater*

Groundwater beneath the KRCDPP occurs under unconfined and semi-confined conditions. Groundwater levels in the area have declined by about 40 feet since 1940. Although there are no wells with long-term records in the immediate area, water levels in wells north of the project site may have been within 10 feet of the surface prior to 1940. The depth of groundwater near the project site in 1950 was about 20 feet below ground surface. Since 1960, the depth to groundwater has remained approximately 50 feet below ground surface. It is unlikely that groundwater will return to its pre-1940 levels because of groundwater management practices.

### *5.11.2.6 Liquefaction*

During strong ground shaking, loose, cohesionless saturated soils can experience a temporary loss of shear strength known as liquefaction. Liquefaction is dependent on grain size distribution (silt to sands), relative density of the soils, degree of saturation (groundwater less than 60 feet below ground surface), and intensity and duration of the earthquake. Liquefaction can cause seismically induced settling of buildings and infrastructure.

#### *5.11.2.7 Dynamic Compaction*

Dynamic compaction of soils occurs when relatively unconsolidated coarse-grained particles lose soil volume because of seismic events or mechanical vibration. This volume loss occurs as the vibration rearranges the soil particles into a denser state.

#### *5.11.2.8 Hydrocompaction*

Hydrocompaction occurs when the volume of certain types of soil is reduced by the application of water. Soil types that are susceptible to hydrocompaction include loess, windblown silt, clayey loose sand, loose sand cemented by soluble salts, and fine-grained flash flood deposits.

#### *5.11.2.9 Subsidence*

Subsidence is a potential geologic hazard that may occur from groundwater withdrawal, gas and oil withdrawal, hydrocompaction from irrigation, or peat oxidation. Subsidence can cause damage to overlying structures.

#### *5.11.2.10 Expansive and Highly Erodible Soils*

Soils that contain a high percentage of expansive clay minerals are potentially susceptible to swelling and shrinking, depending on water content. The soils present at the KRCDPP project site include the Hanford and Hesperia series, which consist of sandy loams with a low shrink-swell potential. Soil types are further described in Section 5.6, Agriculture and Soils.

#### *5.11.2.11 Landslides*

The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, other contributing factors include erosion by waterbodies, rock and soil slopes are weakened through saturation, earthquakes creating stresses that make weak slopes fail, volcanic eruptions and excess weight from accumulation of stockpiling of rock or ore, waste piles, or from man-made structures may stress weak slopes to failure and other structures (USGS, 2003). Any area composed of very weak or fractured materials resting on a steep slope can and will likely experience landslides.

#### *5.11.2.12 Tsunamis and Seiches*

Tsunamis and seiches are earthquake-induced water waves that may inundate low-lying areas near bodies of water. The only water body located in the area of the KRCDPP is the Central Canal, which borders the lower eastern boundary of KRCDPP project site. The Central Canal is owned and operated by the Fresno Irrigation District (FID).

#### *5.11.2.13 Volcanic Hazards*

The nearest volcanic areas include the Inyo Craters, Mono Craters Caldera, and the Long Valley Caldera. These volcanic centers are located between 70 and 120 miles east and northeast of the KRCDPP project site (Jennings, 1994).

#### *5.11.2.14 Geologic Mineral Hazards*

Some naturally occurring minerals and gases, such as asbestos, mercury, and radon, are hazardous to human health. Asbestos, mercury, and radon are not a known hazard in the Fresno area (CDC, 2003).

#### *5.11.2.15 Geologic Resources*

Geologic resources of recreational, commercial, or scientific value in the vicinity are limited to sand, gravel, oil, and gas. Sand and gravel are present in the eastern portion of Fresno County. No active mines are present within 10 miles of proposed KRCDPP.

There are no oil and gas wells on the project site. The nearest well is located about one-half mile southwest of the site. The nearest oil and gas field is located about 12 miles to the southwest.

### 5.11.3 Laws, Ordinances, Regulations, and Standards

The LORS applicable to geologic resources and hazards are summarized below in Table 5.11-2.

**Table 5.11-2**
**Geologic Resources and Hazards - LORS**
**KRCDPP**

| Jurisdiction | Authority | Administering Agency | Compliance |
|---|---|---|---|
| State/Local | UBC, 1999 | Fresno County Department of Public Works and Planning | Acceptable design criteria for structures with respect to seismic design and load-bearing capacity. |
| State/Local | California Building Code (CBC), 1998 | Fresno County Department of Public Works and Planning | Acceptable design criteria for structures with respect to seismic design and load-bearing capacity. |
| State/Local | California Government Code, Section 53091 | Fresno County Department of Public Works and Planning | Exempts facilities for the generation and transmission of electrical energy by a local public agency, such as the KRCDPP from obtaining Fresno County building permits. |
| Local | Health and Safety | Fresno County | To the extent that a project is not |

| Table 5.11-2<br>Geologic Resources and Hazards - LORS<br>KRCDPP | | | |
|---|---|---|---|
| **Jurisdiction** | **Authority** | **Administering Agency** | **Compliance** |
| | Element, Fresno County General Plan, 2000 | Community Health Department | exempted by Section 53091 (above), the County and City shall require compliance with the safety elements of the general plan. |

## 5.11.4 Environmental Impacts

### *5.11.4.1 Environmental Checklist*

The following Table 5.11-3 is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist that will be used by the California Energy Commission (CEC) to assess the potential for significant impacts to geologic resources and hazards.

| Table 5.11-3<br>CEQA Environmental Checklist –Geologic Resources and Hazards<br>KRCDPP | | | | |
|---|---|---|---|---|
| **GEOLOGIC RESOURCES AND HAZARDS – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| 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. | | | | X |
| ii) Strong seismic ground shaking? | | | X | |
| iii) Seismic-related ground failure, including liquefaction? | | | X | |
| iv) Landslides? | | | | X |
| b) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and | | | | X |

| Table 5.11-3<br>CEQA Environmental Checklist –Geologic Resources and Hazards<br>KRCDPP | | | | |
|---|---|---|---|---|
| **GEOLOGIC RESOURCES AND HAZARDS – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | | | | |
| c) Result in substantial soil erosion or the loss of topsoil? | | | | X |
| d) 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? | | | | X |
| e) 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 waste water? | | | | X |
| f) 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? | | | | X |
| g) 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? | | | | X |

### *5.11.4.2 Required Permits and Schedules*

No permits that specifically address geologic resources and hazards were identified.

## 5.11.5 Impact Assessment

### *5.11.5.1 Seismicity*

The potential for ground rupture or ground shaking at the KRCDPP project site is considered unlikely because there are no active faults present in the vicinity of the KRCDPP project site or in Fresno County (Fresno County, 2000). The principal earthquake hazards for Fresno County are from groundshaking (Fresno County, 2000) and strong ground motion from earthquakes (Fresno County, 2003 Draft). The secondary effects from ground shaking could cause damage to buildings and infrastructure elements

such as bridges and pipes. Earthquake damage to dams in the Sierra Nevada could also impact the City of Fresno (Fresno County, 2000).

In the unlikely event there was strong ground shaking, seiches may affect local canals and dams in the Sierra Nevada and result in a low to moderate potential for localized flooding at the project site.

#### *5.11.5.2 Liquefaction*

According to Fresno County, the potential for liquefaction in the KRCDPP project area is low because of the presence of either coarse sands and gravels or high clay content in the soils (Fresno County, 2000). There are fine sands and silts in the area (EPA, 1983), the depth to water is less than 60 feet, and the area is subject to strong ground shaking; for these reasons, however there is a low to moderate potential for liquefaction at the project site. No site-specific information is available to assess the density and types of soils to resolve the potential for liquefaction.

#### *5.11.5.3 Dynamic Compaction*

No site-specific information is currently available to assess dynamic compaction in the area of the proposed KRCDPP. However, since the area of the KRCDPP has been subjected to strong shaking by earthquakes, the potential for dynamic compaction is low to moderate.

#### *5.11.5.4 Hydrocompaction*

No site-specific information is currently available to assess the potential for hydrocompaction; however, because the sediments were deposited by water, the potential for hydrocompaction is considered to be low to moderate.

#### *5.11.5.5 Subsidence*

The potential for subsidence to be a significant site hazard in the area of the proposed KRCDPP is considered to be low (USGS, 1999).

#### *5.11.5.6 Expansive and Highly Erodible Soils*

No site-specific information is available to assess the shrink-swell potential of the clays in layers below the soils. Since the site is relatively flat, however, the potential for slope instability, or substantial soil erosion is low.

#### *5.11.5.7 Landslides*

The relatively flat terrain at the KRCDPP site and surrounding area makes the potential for landslides unlikely.

#### *5.11.5.8 Tsunamis and Seiches*

The KRCD site is not located near the coast or any significant bodies of water, and therefore, tsunamis and seiches are not considered as potential hazards. There is a moderate potential for seiches from the canal located to the east of the KRCDPP site or from breaches in the levees during earthquakes, as discussed above.

#### *5.11.5.9 Volcanic Hazards*

The nearest volcanic centers are located between 70 and 120 miles east and northeast of the KRCDPP project site (Jennings, 1994). The potential for volcanic hazards affecting the KRCDPP project site is unlikely.

#### *5.11.5.10 Geologic Mineral Hazards/Geologic Resources*

No active mines are present within 10 miles of proposed KRCDPP. Available data cannot identify whether there are significant mineral resources beneath KRCDPP.

Oil and gas resources will not be affected by the proposed KRCDPP.

### 5.11.6 Mitigation Measures

The geologic hazards with potentially significant impacts (ground shaking and liquefaction) can be mitigated by a thorough geotechnical evaluation of the site and preparing an engineering design in accordance with the CBC. A geotechnical analysis will be prepared prior to construction of the proposed KRCDPP.

The potential for seiches from adjacent canals and the failure of dams in the Sierra Nevada can be mitigated through the development and implementation of an emergency response and preparedness plan.

### 5.11.7 Cumulative Impacts

There will be no cumulative impacts on geologic resources or hazards resulting from either construction or operation of the proposed KRCDPP.

### 5.11.8 References

California Building Code (CBC), 1998, California Code of Regulations, Title 24, California Building Standards Code.

California Department of Conservation (CDC).

CDC, 1996. Probabilistic Seismic Hazards Map.

CDC, 1999. Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps, Special Publication 42 Revised 1997 with Supplements 1 and 2 added 1999, Division of Mines and Geology, 38 pp.

Fresno County, 1997, Fresno County General Plan Background Report, May.

Fresno County, 2000, Fresno County General Plan Update, February.

Fresno County, 2003. Draft, Fresno County 2025 General Plan Update.

Jennings, C.W., 1994. Fault and Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, California Division of Mines and Geology, Map No. 6.

Mualchin L., 1996. A Technical Report to Accompany the CALTRANS California Seismic Hazard Map. Prepared for CALTRANS by the Office of Earthquake Engineering. July 1996.

Norris R.M. and R.W. Webb, 1990. Geology of California (Second Edition). John Wiley and Sons. New York. 365 pp.

Uniform Building Code (UBC), 1999.

U.S. Geological Survey (USGS),

USGS, 1969. Geology, Hydrology, and Water Quality in the Fresno Area, California, Open-File Report 6417-03, Water Resources Division, 70 pp.

USGS, 1981. Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections, Professional Paper 1401-C, 54 pp.

USGS, 1981. Malaga, California, 7.5 Minute Quadrangle Map, photo revised.

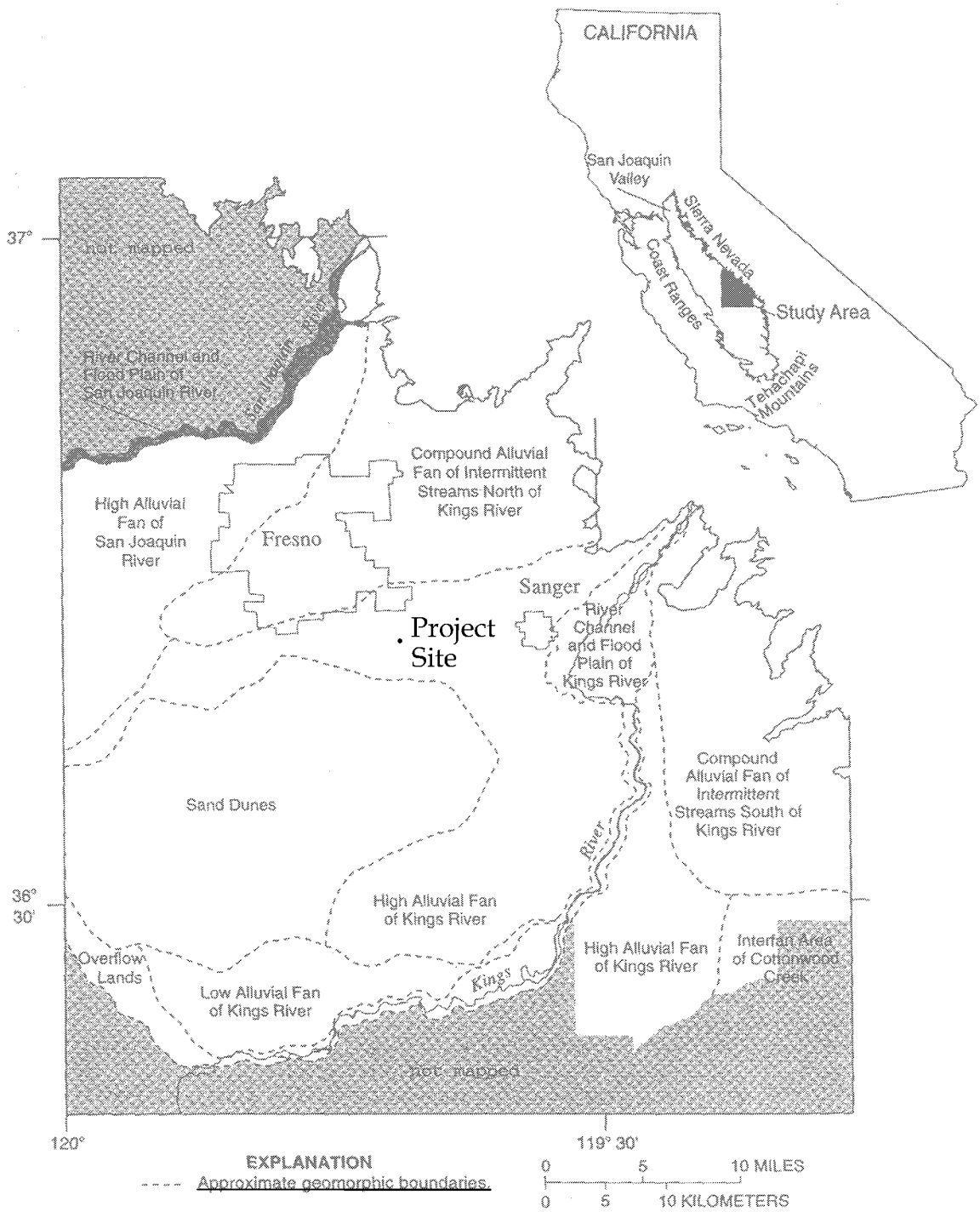
USGS, 1997. Hydrogeologic acies Characterization of an Alluvial Fan near Fresno, California, Using Geophysical Techniques, Open-File Report 97-46.

USGS, 1999. and Subsidence in the San Joaquin Valley, California, USGS Circular 1182, p 22-34.

USGS, 2003. Definition of Landslides. Website at: http://landslides.usgs.gov/html_files/nlic/page5.html

Wagner, D.L., Bortugno, E.J. and McJunkin, R.D., 1990.Geologic Map of the San Francisco-San Jose Quadrangle, California, California Division of Mines and Geology. Regional Geologic Map Series, 1:250,000 scale.

Young, L.G., 1999. Open-File Report 99-02, Update to the Fresno County Mineral Land Classification, Aggregate Material in the Fresno Production—Consumption Region, California, Department of Conservation, Division of Mines and Geology.




Source:
Location of geomorphic features, Page and LeBlanc, 1969

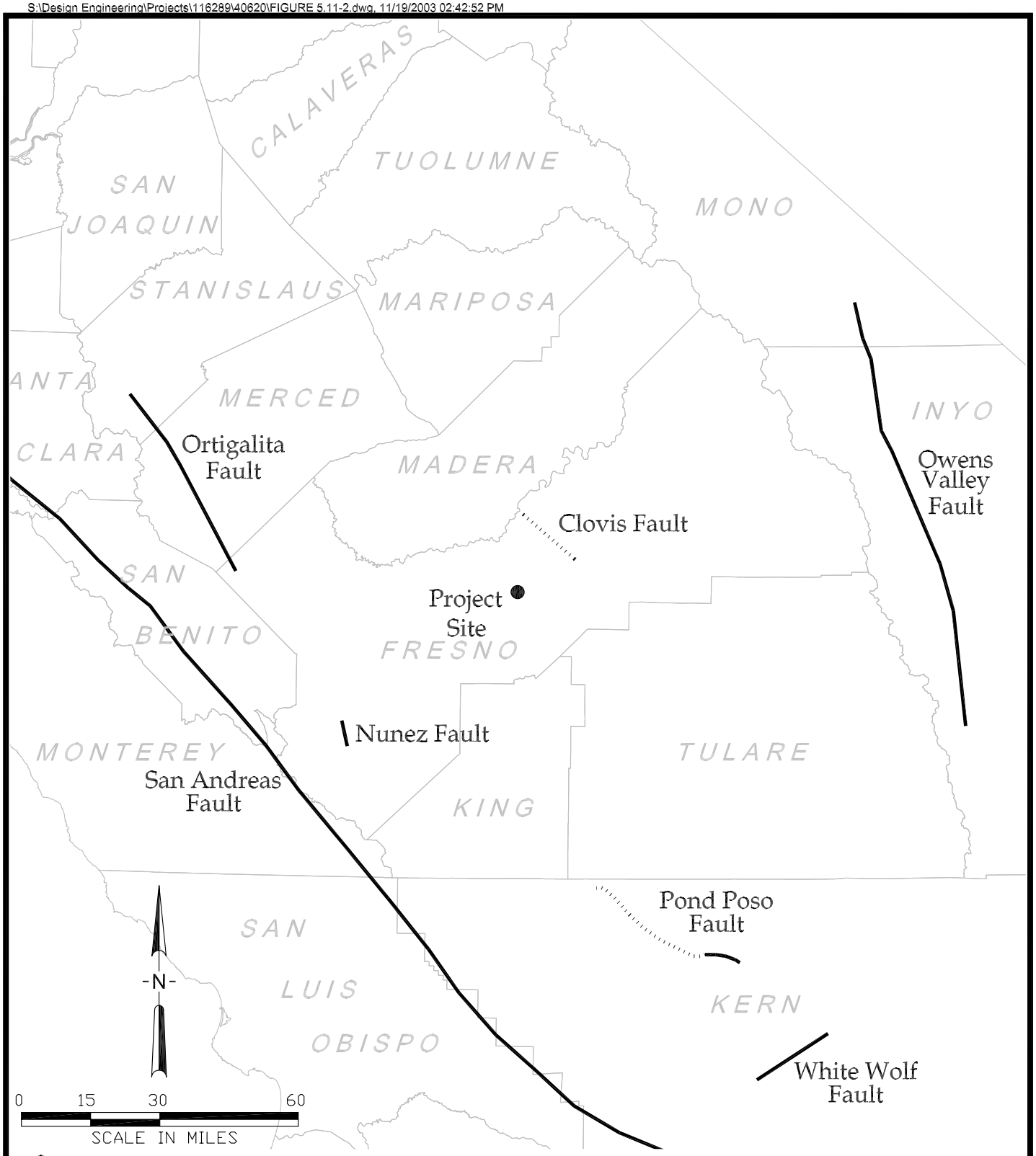
KRCD
Kings River Conservation District

FIGURE 5.11-1

Geologic Resources

KRCDPP

S:\Design Engineering\Projects\116289\40620\FIGURE 5.11-2.dwg, 11/19/2003 02:42:52 PM




Source:
Fault-Rupture Hazard Zones in California
Special Publication 42, Revised 1997, Supplements 1 and 2 added 1999,
Department of Conservation, Division of Mines and Geology, State of California

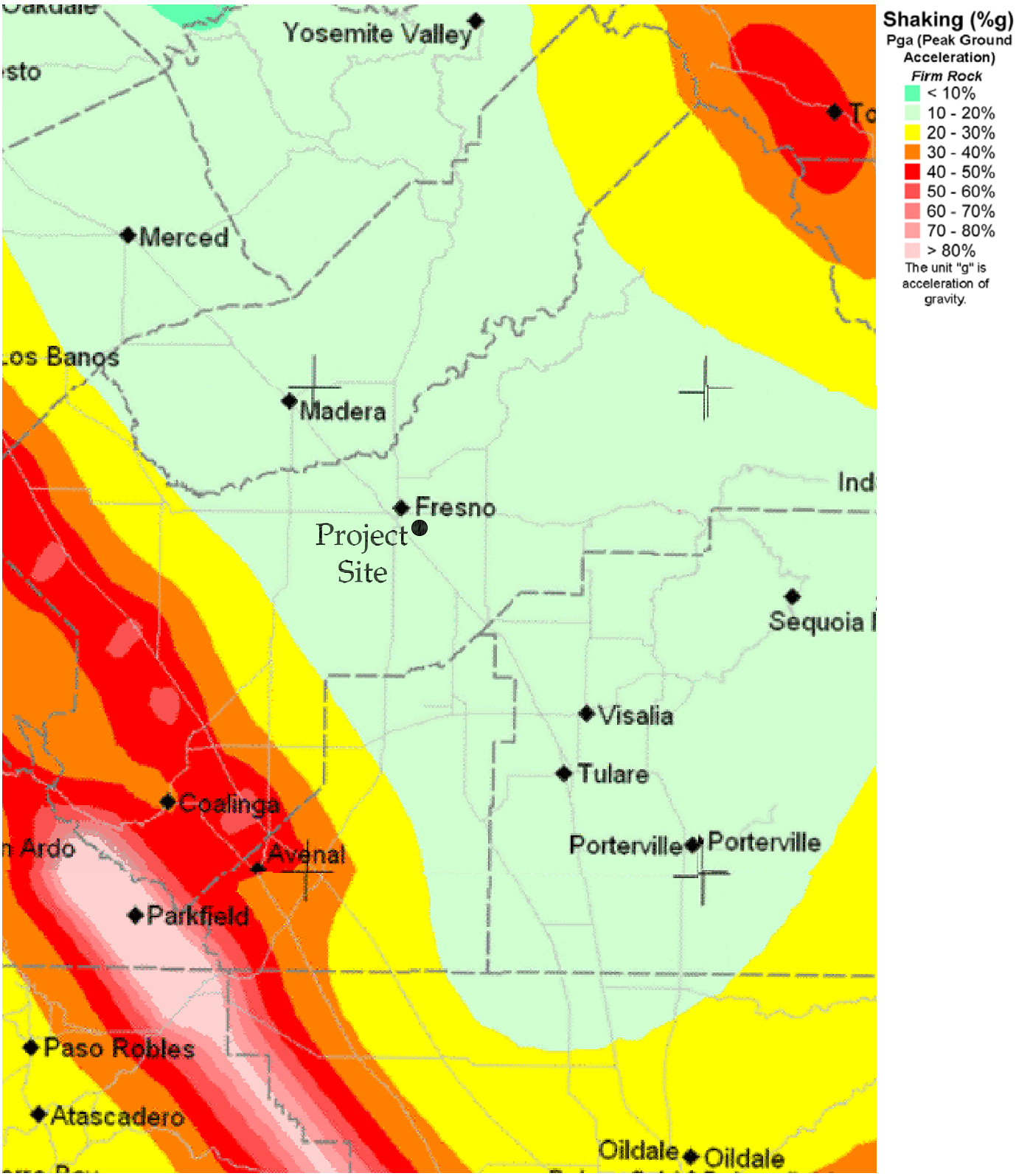
KRCD
Kings River Conservation District

FIGURE 5.11-2

Faults in the
KRCDPP Area

KRCDPP

10/17/03 REV. 0




Source:
Seismic Shaking Hazards in California
Based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model, 2002 (revised April 2003).

KRCD
Kings River Conservation District

FIGURE 5.11-3

Probabilistic Seismic Hazards Assessment in the KRCDPP Project Area

KRCDPP

# SECTION 5.12 SOCIOECONOMICS

## 5.12.1 Introduction

The technical area of socioeconomics includes several related areas of interest and concern regarding the proposed Kings River Conservation District Peaking Plant (KRCDPP). A typical socioeconomic impacts analysis evaluates the effects of short-term and long-term project-related changes on areas including population, housing, employment, and the capabilities of local governmental agencies to continue providing adequate levels of public services. Socioeconomic impacts analyses also include an evaluation of environmental justice issues to ensure that disproportionately high and adverse human health or environmental effects on minority communities and low-income communities are identified and addressed.

## 5.12.2 Affected Environment

### *5.12.2.1 Regional Setting*

Fresno County occupies a large area of the central San Joaquin Valley, with thousands of acres dedicated to agriculture. Fresno County is bordered on the north by Madera and Merced counties, to the east by Mono and Inyo counties, to the south by Tulare and Kings counties, and to the west by Monterey and San Benito counties. Fresno County serves as a financial, trade, commercial, and educational center for central California. In addition to an extensive highway system, several motor freight carriers and a railway network, the county is also home to nine airports, including six public airports and three private airports.

### *5.12.2.2 Project Area Setting*

Kings River Conservation District (KRCD) currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19-acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Project effects on population, housing, employment, government and other public services, and environmental-justice related issues would occur within and affect the capabilities of Fresno County, which is therefore considered the region of influence for this socioeconomics analysis.

**Population**

The January 1, 2003 population for Fresno County was 841,423, which represented a 1.7 percent increase from the January 1, 2002 population of 827,300 (DOF, 2003a). Approximately 53 percent of the county's population lives in the City of Fresno, 20 percent in the unincorporated area, and another 9 percent in the City of Clovis. Reedley, Sanger, and Selma each average about 2.5 percent of the county population, with the remaining 15.5 percent of the county's population living in Coalinga (2 percent), and Firebaugh, Fowler, Huron, Kerman, Kingsburg, Mendota, Orange Cove, Parlier, and San Joaquin (each less than 2 percent).

There are 4 United States (US) census tracts surrounding the KRCDPP project area that had approximately 17,781 residents as of the 2000 US Census. These census tracts are identified as numbers 12.01, 12.02, 14.06, and 15 and are included as Appendix 5.12-1. The Community of Malaga, represents from about 0.2 to 2.0 percent of the population of Fresno County when analyzing potential socioeconomic impacts

As shown below in Table 5.12-1 and based on California Department of Finance (DOF) interim county population projections, Fresno County's population is expected to increase from 2005 to 2020 by approximately 27 percent.

**Table 5.12-1**
**Fresno County Projected Populations**
**KRCDPP**

| Year | Projected Population | Percent Increase |
|---|---|---|
| 2005 | 893,300 | 6.16 percent increase from 2003 |
| 2010 | 970, 900 | 8.87 percent increase from 2005 |
| 2015 | 1,043, 100 | 7.44 percent increase from 2010 |
| 2020 | 1,134, 600 | 8.77 percent increase from 2015 |

Source: DOF, 2003a
Note: Expected population change between 2005 and 2020 is calculated at 27 percent (i.e. Year 2020 projection divided by the Year 2005 projection).

The Fresno County population increase from 2005 to 2020 is less than the percent gains expected in 40 of the other California counties. In general, DOF projected population increases from 2000 through 2020 will range from less than 30 percent in 18 counties, 30 to 50 percent in 21 other counties (including Fresno County from 2000 through 2020), and greater than 50 percent in the remaining 19 counties (DOF 2003a). In total there are 58 counties in California.

Based on growth projections in Fresno County, and assuming that the Community of Malaga experiences similar growth rates, it can be reasonably assumed that the potentially affected population will range from 2,032 to 22,582 residents that comprise from 0.2 to 2.0 percent of the Fresno County population.

**Housing**

Based on City/County Population and Housing Estimates developed by the DOF, the housing stock for Fresno County on January 1, 2003 totaled 279,874 units (DOF, 2003a). Single-family homes accounted for 193,930, or approximately 69 percent of these units. Multiple-family units accounted for 72,598, or about 26 percent, and mobile homes totaled 13,346 units, or about five percent of the county housing stock. Of this housing stock, 261,578 units, or approximately 93 percent, were occupied with an average of 3.1 persons per household (DOF, 2003a).

There were 3,196 new housing authorizations in Fresno County in 2000 valued at $454.4 million, which included 2,988 single-family units and 208 multi-family units. The median home price in December 2001 was $120,000 and the county vacancy rate was 6.6 percent (DOF, 2002).

**Labor**

Fresno County's labor force was founded on the strength of the agricultural economic base. However, it is becoming increasingly diverse, with much more active services government, and retail and trade sectors. Based on information published by the Labor Market Information Division (LMID) of the California Employment Development Department (CEDD), the 2002 annual average employment statistics show the civilian labor force for Fresno County to be approximately 456,800, which represented an increase of about 13,000 from 2001. Fresno Metropolitan Statistical Area (MSA) civilian employment for 2002 was 392,400; unemployment was 64,400, or 14.1 percent, which was substantially higher than the state's rate of 5.3 percent. Agriculturally oriented counties tend to have greater seasonal variations in employment, and, as a result, usually have higher unemployment rates (CEDD, 2002a). March 2002 employment by industry in the Fresno MSA is shown below in Table 5.12-2.

| Table 5.12-2<br>County Employment Distribution<br>KRCDPP | | |
|---|---|---|
| **Job Category/Industry** | **Number of Employees** | **Percentage of Total Employment** |
| Agriculture | 55,700 | 15.2 |
| Natural Resources and Mining | 400 | .1 |
| Construction | 18,500 | 5.5 |
| Manufacturing | 29,800 | 8.1 |
| Wholesale Trade | 12,800 | 3.5 |
| Retail Trade | 35,900 | 9.8 |
| Transportation, Warehousing and Utilities | 10,100 | 2.8 |
| Information | 5,300 | 1.4 |
| Financial Activities | 14,900 | 4.1 |
| Professional and Business Services | 27,500 | 7.5 |
| Education and Health Services | 38,700 | 10.5 |
| Leisure and Hospitality | 27,200 | 7.4 |
| Other Services | 12,500 | 3.4 |
| Government | 77,600 | 21.2 |
| **Total Employment** | **366,900** | |
| Source: CEDD, 2003a | | |

Job growth creates opportunities, and is considered to be one measure of economic health. From 1997 through 2001, Fresno County added 13,800 new jobs, a cumulative growth of 4.5 percent (CEDD, 2002a). A minor employment decline in 2001 was attributable to the loss of about 8,200 jobs in farm industries. However, there were gains in some of the county's major non-farm industries; government added 2,300 jobs, services grew by 1,500 jobs, and the "retail trade" and "construction and mining" sectors added 1,300 and 1,100 new jobs, respectively (CEDD, 2002a).

According to 1999-2006 non-farm industry employment projections, the largest growth over the forecast period will be in the services, government, and retail trade industries. Services, the largest industry in the county, currently accounts for 22 percent of the county's employment (CEDD, 2002a). The services industry is projected to reach approximately 79,500 jobs by 2006, which represents an increase of over 17 percent, or 11,800 new jobs. Government provided almost 21 percent of all employment in 2001. Government is projected to grow by 9,000 jobs between 1999 and 2006, mostly with new local government jobs.

## Public Services

### Fire Protection/Hazardous Materials

The Fresno County Fire Protection District (FCFPD) provides fire protection services to the area of the proposed KRCDPP. The FCFPD was formed in 1993 by the consolidation of the Mid Valley and Westside Fire Protection Districts and contracts with the California Department of Forestry and Fire Protection (CDF) for personnel and administration.

The FCFPD shares its headquarters with CDF at a complex located in Sanger and now serves the approximately 3,800 square miles of Fresno County, four cities and a variety of other entities from its 24 fire stations located throughout the county. The Fire Station closest to the KRCDPP is Fire Station 87 - South Fresno, which is located at 4706 E. Drummond Avenue and is located approximately 1.2 miles from the KRCDPP project site. Fire Station 87 has two fire engines, is manned 24 hours a day, and has an advanced life support rescue unit. The next closest fire station is Fire Station 7, which is located at 2571 South Cherry Avenue and near Jensen Avenue. Fire Station 7 has one engine and a Hazardous Materials Decontamination Trailer. Fire Station 87 could respond to a call from the KRCDPP site in less than 5 minutes (FCFPD, 2003).

In the event of an emergency offsite release, KRCDPP personnel will defer to the Hazardous Material Teams associated with the FCFPD, specifically those housed at Fire Station 7.

### Police Protection

The Fresno County Sheriff's Department provides law enforcement services to the area of the proposed KRCDPP. The Sheriff's Department serves a population of approximately 200,000 rural and metropolitan residents in Fresno County (ESA, 2003). They patrol more than 6,000 square miles of central California with a diversity of terrain that varies from open farm lands of the western county to rugged mountain peaks of over 11,000 feet to the east in the Sierra Nevada mountain range. The Fresno County Sheriff's Department serves the unincorporated population of Fresno County with 329 sworn officers for a ratio of 1.09 officers per 1,000 residents (Fresno County, 2000b). The service territory of the Fresno County Sheriff's Department is divided into four separate areas, which are identified as Areas 1 to 4. Area 2, the Northeast Field Services Bureau, includes the unincorporated portions of Fresno County and would serve the area of the proposed KRCDPP. The Lincoln Beat 31 field office in Area 2 is the closest to the proposed KRCDPP, is located in the City of Fresno at 5717 East Shields Avenue. The office is staffed 24 hours a day, 7 days per week by one deputy sheriff. The response time for an emergency call from the KRCDPP would include a maximum 3-minute

dispatch of the emergency call to a deputy, with the subsequent response time dependent on the location of the responding deputy/unit.

The California Highway Patrol also provides traffic enforcement services to the unincorporated area of Fresno County and has a mutual aid agreement with the Fresno County Sheriff's Department.

**Emergency Medical Services/Hospitals**

Fresno County is served by six ambulance services or agencies. American Ambulance is the sole 9-1-1 paramedic ambulance provider for over 4000 square miles of Fresno County. American Ambulance is the primary private emergency medical provider for the Fresno County and Kings County areas. The communications center dispatches every 9-1-1 and non-emergent ambulance request and is located at the northeast corner of Divisadero Street and Freeway 41, and serves a population of approximately 450,000 people. The average response time for emergency calls ranges from five to eight minutes (Fresno County, 2000b). American Ambulance dispatchers utilize Global Positioning Satellites and Computer Aided Dispatch technology to send the closest, most appropriate Paramedic Ambulance to each emergency. The current system works diligently to provide pre-arrival care instructions and ambulance coordinating and dispatching.

The two hospitals located closest to the proposed KRCDPP are the Community Medical Center of Fresno, located at the intersection of Fresno and R Streets, and approximately 5.8 miles and an 8 minute response time away from the project site; and the University Medical Center located at 445 South Cedar Avenue and approximately 5.0 miles and a 9 minute response time away from the site.

Community Medical Center-Fresno is located in downtown Fresno less than one block from Freeway 41. It has 416 licensed beds, is one of California's largest health care facilities, and provides a wide range of inpatient and outpatient services, including: technologically advanced medical/surgical services, 24-hour emergency care, intensive care, cardiovascular care units, family birth center, rehabilitation center, sub-acute center, and cancer services.

The University Medical Center is a county supported community hospital licensed for 417 beds, with an annual count of approximately 65,000 in the Emergency Department. It is the only Level 1 Trauma Center serving a several county area in Central California. It is a major teaching institution, having approximately eighty full-time faculty physicians and a house staff of 145. Approximately 1,250 emergency medical system radio calls are handled monthly.

### Public Schools

The project area is located within the boundaries of two school districts, the Fowler Unified School District and the Sanger Unified School District. The Fowler Unified School District serves the south central region of Fresno County. There are six schools within the Fowler Unified School District that are comprised of students from the communities of Fowler and Malaga (ESA, 2003). The school closest to the KRCDPP is Malaga Elementary School, which is located approximately .62 miles from the project site at 3910 South Ward Avenue.

### Parks and Recreation

Fresno County has a wide variety of recreational resources, including regional parks, State and national parks, national forests, wilderness areas and other resources. Local park service within the area is provided by either the Fresno County Parks Division or the Malaga County Water District (MCWD), depending on the location of the park (ESA, 2003). There are no local parks located within one-mile of the project area (City of Fresno, 2003).

### Water and Wastewater Services

Many unincorporated communities within Fresno County have elected to form special districts to provide water supply, sewage collection and wastewater treatment and other services. MCWD is such a district and provides water and wastewater services in the area of the proposed KRCDPP. The KRCDPP will interconnect to the MCWD system for power plant cooling and domestic use. The proposed KRCDPP will operate as a zero liquid discharge facility and will not require an interconnection for wastewater discharge other than the interconnection to the MCWD sewer system for domestic use.

The wastewater treatment plant owned by the MCWD is located on the northwest corner of Central Avenue and Maple Avenue and approximately one mile from the KRCDPP project site. The treatment plant is designed with a 1.2 million gallon per day capacity. The plant currently receives 750,000 to 800,000 gallons per day (ESA, 2003).

### Solid Waste

The MCWD, who manages solid waste collection services through a private hauler, provides solid waste services to the area of the proposed KRCDPP. The Fresno County Planning & Resource Management Department provides solid waste coordination and solid waste disposal activities outside of the MCWD service boundaries (ESA, 2003).

Fresno County operates two active solid waste disposal facilities, or landfills; the American Avenue Landfill and the Coalinga Landfill. These landfills serve 6,000 square miles, with a population of 760,900 people (ESA, 2003). The American Avenue Landfill has been established as the regional landfill in Fresno County and is a class III landfill that only accepts standard municipal waste. The landfill has a total capacity of 41.1 million cubic yards and handles on average 1,700 tons per day. As of January 1997, the landfill was at eight percent of capacity with a life expectancy of approximately 32 to 40 years (Fresno County, 2000b). The Coalinga Landfill is a Class III landfill located at 30825 Lost Hills Road in Coalinga, receives approximately 37 to 38 tons per day, and has a capacity of approximately 3.3 million cubic yards. The landfill has a life expectancy of approximately 40 years (Fresno County, 2000a).

Portions of the unincorporated areas of Fresno County also use the Clovis Landfill and the Orange Avenue Landfill, which primarily serve the City of Clovis and the City of Fresno, respectively.

**Telephone Service**

Telephone service in the area of the proposed KRCDPP is provided by SBC Communications.

### *5.12.2.3 Work Force*

**Construction**

Construction of the proposed KRCDPP and associated linear facilities will take approximately 6 months and will require an average of 68 workers with a peak of 101 workers in month 5. Table 5.12-3 indicates the maximum number of workers, by job classification, who would be required for construction of the KRCDPP and associated linear facilities. Construction is tentatively scheduled to begin in June 2004 and end in December 2004. The estimated online date for the proposed KRCDPP is December 31, 2004.

**Table 5.12-3**
**Construction Workers by Job Class by Month**
**KRCDPP**

| Job Category | Months of Construction | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| Boiler Maker | | | | 4 | 8 | | 12 |
| Carpenter | 2 | 8 | 8 | 6 | 2 | 1 | 27 |
| Cement Mason | | 6 | 6 | 4 | | | 16 |
| Electrician | 2 | 8 | 12 | 21 | 21 | 21 | 85 |
| Iron Worker | | 6 | 6 | 6 | | | 18 |

| Table 5.12-3<br>Construction Workers by Job Class by Month<br>KRCDPP | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Job Category** | **Months of Construction** | | | | | | **Total** |
| | **1** | **2** | **3** | **4** | **5** | **6** | |
| Laborer | 8 | 10 | 12 | 12 | 10 | 6 | 58 |
| Millwright | | | | 4 | 6 | 4 | 14 |
| Operator | 6 | 6 | 9 | 6 | 6 | 2 | 35 |
| Painter | | | | | | 4 | 4 |
| Pipe Fitter | | 5 | 10 | 10 | 10 | 5 | 40 |
| Insulator | | | | | 2 | 4 | 6 |
| Lineman | | | | | 18 | | 18 |
| Total Craft Labor | 18 | 49 | 63 | 73 | 83 | 47 | 333 |
| Field Start-up | | | | 4 | 10 | 10 | 24 |
| Field Non-Manual | 3 | 3 | 5 | 5 | 8 | 8 | 32 |
| **Total On-Site Labor** | **21** | **52** | **68** | **82** | **101** | **65** | **389** |

**Operation and Maintenance**

Operation and maintenance (O&M) of the proposed KRCDPP would require 3 full time personnel.

### *5.12.2.4 Environmental Justice*

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," signed on February 11, 1994, requires all federal agencies to develop environmental justice strategies. The United States Environmental Protection Agency (USEPA) subsequently issued guidelines to assist all federal agencies to develop strategies to address these issues (USEPA, 1998). Federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

The guidelines state that the environmental justice analysis should focus both on the overall affected area and population and on smaller areas and/or communities within the affected area. This analysis, as described above therefore, focuses on the 4 census tracts surrounding the proposed KRCDPP, which extend about 4 to 6 miles away from the site in all directions.[1] Census tract information is included as Appendix 5.12-1. Race and economic information from this surrounding area is compared to the next larger political

[1] The guidelines state that census and other data should be used to characterize the population within the affected area, in terms of minority (i.e. racial or ethnic), economic, and educational demographics (USEPA, 1996).

jurisdiction/geographic area – Fresno County, to appropriately place population, economic, and educational affects on the local area within the greater county context to reveal any disproportionate adverse impacts from the KRCDPP.

### 5.12.3 Laws, Ordinances, Regulations, and Standards

#### *5.12.3.1 Federal*

As described above, Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the USEPA and all other federal agencies to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

#### *5.12.3.2 State*

The California Code of Regulations, Section 15131, requires:

- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and/or avoid the significant effects on the environment.

#### *5.12.3.3 Local*

There have been no local socioeconomic LORS identified as applicable to the proposed KRCDPP.

### 5.12.4 Environmental Consequences

#### *5.12.4.1Environmental Checklist*

The following is an excerpt from the California Environmental Quality Act (CEQA) Initial Study Environmental Checklist and will be used by the California Energy Commission (CEC) to assess the potential for significant impact to socioeconomics. This section discusses the potential for significant impacts associated with construction or O&M of the proposed KRCDPP in relation to the checklist questions in Table 5.12-4, below.

| Table 5.12. 4<br>CEQA Environmental Checklist – Socioeconomics<br>KRCDPP | | | | |
|---|---|---|---|---|
| **SOCIOECONOMICS – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| 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)? | | | | X |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | | | | X |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | | | | X |
| d) 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? | | | X | |
| Police protection? | | | | X |
| Schools? | | | | X |
| Parks? | | | | X |
| Other public facilities? | | | | X |

### *5.12.4.2 Impact Assessment – Construction and O&M*

**Population**

Construction of the proposed KRCDPP including associated linear facilities will have no impact with respect to inducing substantial population growth. The peak number of management and skilled and unskilled laborers traveling to or from the site at any one

time during construction is approximately 101 workers, with an average of 68 workers a month over the 6 month construction schedule. These temporary workers would likely be drawn from the Community of Malaga, Fresno County, and the surrounding counties and regions, depending on the availability of the necessary elements of the required management and labor pool. An identification of the number of workers required by job category was provided above in Table 5.12-3. The majority of the construction work would be contracted out to residents who would travel daily or weekly to the county, but would not need to relocate to the area to fulfill the construction contract's requirements.

**Housing**

Construction of the proposed KRCDPP will also not result in an impact on housing. The proposed KRCDPP will not require the construction of additional housing to support the temporary worker population, nor will it impact the local housing inventory. It is anticipated that the small number of construction workers requiring temporary lodging will be accommodated by locally available motel or rental units, which have vacancy rates capable of handling the additional, temporary influx of workers. It is also assumed that most workers would be drawn from the Community of Malaga, Fresno County, and the surrounding counties and regions and therefore would commute to the site and not require temporary housing.

The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the Pacific Gas and Electric Company (PG&E) Malaga Substation located on the northeast intersection of North and Willow Avenues, as described further in Section 5.5, Land Use. The proposed KRCDPP would also not result in the displacement of any of the users. The number of personnel required for O&M is minimal and would not impact housing.

**Labor**

Project construction will have a short-term beneficial impact to qualified labor. Project construction will create an average demand of 68 workers a month. These workers would likely be drawn from the Community of Malaga, Fresno County, and the surrounding counties and regions, depending on the availability of the necessary elements of the required management and labor pool. Table 5.12-3, above, indicates the estimated number of construction workers, by job classification, who would be employed by project construction. Anticipated payroll impacts totaling approximately $4.5 million would constitute a direct, beneficial impact to the local and regional economy. Secondary and

indirect effects would also benefit the community and Fresno County as these payroll dollars are spent on local and regional goods and services.

The California Employment Development Department (CEDD) projects occupational employment from 1999 to 2006, and calculates absolute and percentage changes. These projections, when compared to the maximum number of construction workers, by job classification, that would be employed by project construction, indicate the availability of construction trades in Fresno County, as shown below in Table 5.12-5.

**Table 5.12-5**
**Available Labor by Skill in Fresno County**
**KRCDPP**

| Occupational Title | Annual Averages | | Absolute Change | Percentage Change |
|---|---|---|---|---|
| | 1999 | 2006 | | |
| Welders & Cutters | 760 | 820 | 60 | 7.9 |
| Carpenter | 2,520 | 2,880 | 360 | 14.3 |
| Cement Mason | 50 | 60 | 10 | 20.0 |
| Electrician | 1,250 | 1,440 | 190 | 15.2 |
| Structural Metal Workers | 320 | 360 | 40 | 12.5 |
| Laborer-Helper | 560 | 640 | 80 | 14.3 |
| Power Maintenance Mechanic | 340 | 370 | 30 | 8.8 |
| Power Plant Operator | 140 | 160 | 20 | 14.3 |
| Painter | 660 | 740 | 80 | 12.1 |
| Pipe Fitter | 830 | 940 | 110 | 13.3 |
| Sheet Metal Duct Installer | 160 | 210 | 50 | 31.3 |

Source: CEDD, 2003a

Table 5.12-5 indicates that the number of adequate labor by skill in Fresno County is increasing, and should be adequate to support the KRCDPP, and therefore not substantially affected by project construction labor demand.

### Public Services Impacts

#### Fire Protection/Hazardous Materials

Construction and O&M of the KRCDDPP would have no significant impact on existing fire protection services in the project area. The addition of the KRCDPP would add another industrial facility to those served by the FCFPD, thereby increasing the potential workload, especially during multiple simultaneous fires when fire protections services are needed elsewhere. However, the FCFPD is well established, and has sufficient facilities to respond to fires at the project site including Fire Stations 7 and 87, which are located closest to the area of the proposed KRCDPP.

**Police Protection**

Construction and O&M of the KRCDPP would have no significant impact on existing police protection services. In addition, the KRCDPP will include appropriate site security measures, as applicable and including fencing and locked gates to minimize the potential need for Fresno County Sheriff's Department assistance.

**Emergency Medical Services**

Construction and O&M operation of the KRCDPP will have no impact on emergency medical service response times or ratios. Based on the low number of workers as mentioned above, it is not anticipated that the short-term emergency medical response capabilities required during construction or the long-term emergency medical requirements of the full-time O&M staff will noticeably affect response capabilities or times beyond existing service ratios and times.

**Public Schools**

Construction and O&M of the KRCDPP will have no impact on public schools. Most, if not all construction workers will commute to the project site during construction, and will not, therefore, cause a significant increase in local school enrollment. Any increases associated with the addition of the full-time O&M staff is well within the normal range of increase expected from ongoing jobs and housing development in the area.

**Parks and Recreation**

Construction and O&M of the proposed KRCDPP will have no impact on local parks and recreational facilities. Most, if not all construction workers will commute to the area during construction, and will not, therefore, cause an increase in parks and recreational use.

**Water and Wastewater Services**

Construction and O&M of the proposed KRCDPP will have no impact on water and wastewater services. Temporary increase in water and wastewater services required during project construction are minor and can be adequately served by the MCWD's existing systems, as previously described. Any increases in water and wastewater services associated with the addition of the full-time O&M staff is well within the normal range of increased usage expected in the area.

**Solid Waste**

Construction and O&M of the KRCDPP will have no impact on solid waste services. Most, if not all construction workers will commute to the project site during construction and will not relocate to the area, and therefore, will not cause a substantial increase in the

need for solid waste disposal services. Also, as described above, landfills in the area have sufficient capacity to accept any temporary increases in solid waste disposal associated with construction activities at the project site.

### 5.12.5 Environmental Justice Impacts

Tables 5.12-6 and 5.12-7, below, show the ethnic and income distribution by census tract in the area of the proposed KRCDPP. Data for both of these tables were taken from the 2000 US Census data, as specified in the USEPA Guidelines (Guidelines) for use in an environmental justice analysis (USEPA, 1996). According to the Guidelines, a minority population exists if minorities comprise 50 percent or more of the affected area's general population (USEPA, 1996). Table 5.12-6 summarizes the distribution of minority and Hispanic-Latino origin population within the 4 census tracts that are in the area of the proposed KRCDPP. Table 5.12-7 summarizes the distribution of low-income households, families, and individuals within the same 4 census tracts. Each table also compares average minority and income figures to similar estimates for Fresno County.

**Table 5.12-6**
**Race by Census Tract Area and for Fresno County**
**KRCDPP**

| Census Tract Number | Total Population | Percent Hispanic or Latino (of any race)[1] | Percent White | Percent Black or African American | Percent American Indian and Alaska Native | Percent Asian | Percent Native Hawaiian and Other Pacific Islander | Percent responding as "two or more" Races |
|---|---|---|---|---|---|---|---|---|
| 12.01[2] | 5,207 | 52.1 | 28.8 | 5.5 | 2.7 | 3.6 | 0.0 | 5.5 |
| 12.02[3] | 4,213 | 42.4 | 23.0 | 14.7 | 1.5 | 10.8 | 0.1 | 6.1 |
| 14.06[4] | 6,061 | 26.1 | 43.3 | 9.7 | 1.8 | 14.0 | 0.3 | 3.9 |
| 15[5] | 2,300 | 44.6 | 38.1 | 1.9 | 5.4 | 3.3 | 0.0 | 5.2 |
| Census. Tract Average | 4,445 | 41.3 | 33.3 | 7.9 | 2.9 | 7.0 | 0.1 | 5.2 |
| Fresno County[6] | 761,595 | 44.0 | 54.3 | 5.3 | 1.6 | 8.1 | 0.1 | 4.7 |

[1] Calculated as 97 percent of the "Some other race" responses under the "One race" totals on Census Tract data.. It is assumed that the other 3 percent of the "Some other race" respondents would be spread across the 5 race categories in numbers so small as to not substantially affect these percentages. Addition of this 3 percent would result in all percentages within each row summing to 100%. See Appendix 5.12-1 for additional information.
[2]Source: U.S. Census Bureau, 2000a
[3] Source: U.S. Census Bureau, 2000b
[4] Source: U.S. Census Bureau, 2000c
[5] Source: U.S. Census Bureau, 2000d
[6] Source: U.S. Census Bureau, 2000e

**Table 5.12-7**
**Average Income Levels and Poverty Status by Census Tract[7]**
**KRCDPP**

| Census Tract Number | Population in Labor Force | Median Household Income | Median Family Income | Percentage of Families Below Poverty Level | Percentage of Individuals Below Poverty Level |
|---|---|---|---|---|---|
| 12.01[8] | 1,717 | 20,353 | 20,592 | 37.0 | 43.7 |
| 12.02[9] | 1,383 | 24,904 | 24,809 | 28.5 | 35.0 |
| 14.06[10] | 2,522 | 41,642 | 43,936 | 13.2 | 17.6 |
| 15[11] | 915 | 28,304 | 29,353 | 26.8 | 29.4 |
| Census Tract Average | 1,634 | 28,801 | 29,673 | 26.4 | 31.4 |
| Fresno County[12] | 341,944 | 34,725 | 38,455 | 17.6 | 22.9 |

[7] Census 2000 data reports on 1999 income levels and poverty status.
[8] Source: U.S. Census Bureau, 2000f
[9] Source: U.S. Census Bureau, 2000g
[10] Source: U.S. Census Bureau, 2000h
[11] Source: U.S. Census Bureau, 2000i
[12] Source: U.S. Census Bureau, 2000j

The analysis of potentially affected minorities is based on data from the 2000 census as published by the U.S. Department of Commerce (DOC, 2001). Additional clarification on the definition of minority status is included in Appendix 5.12-2. Table 5.12-6 indicates only one census tract— number 12.01— showed the Hispanic or Latino population is greater than 50 percent – specifically at 52.1 percent (see Appendix 5.12-1). This represents a less than significant environmental justice impact for the following reasons:

- Only one of four potentially affected census tracts has a "minority" population of more than 50 percent.

- The average percent Hispanic or Latino population for the four potentially affected census tracts is less (41.3 percent) than the countywide estimate of 44.0 percent.
- Some of those respondents included in the "Percent Hispanic or Latino (of any race)" may be of another race, which may reduce the Census Tract number 12.01 estimate below the threshold of 50 percent, and may result in this census tract not having a meaningfully greater minority population than the other census tracts or Fresno County (see Appendix 5.12-2).

Because the average percentage of any race in all but one potentially affected census tract is less than the 50 percent threshold recommended by the USEPA, and because the average percentage of each race within the 4 potentially affected surrounding census tracts is less than the 50 percent threshold recommended by the EPA, there will be a less than significant environmental justice impact to those of Hispanic or Latino origin.

#### *5.12.5.1 Income Status and Fiscal Resources*

The income status of households, families, and individuals in the 4 census tracts potentially most affected by the proposed KRCDPP was presented above in Table 5.12-7. Median household, family, and individual income levels, and the percentage of families and individuals below the poverty level are presented for each census tract, and averaged for all 4 census tracts. Similar income levels and percentages are presented for Fresno County as a basis for comparison.

Examination of Table 5.12-7 indicates that the average median household and family income levels for the 4 surrounding census tracts are from 13 to 17 percent less than the same income levels for Fresno County. Similarly, the percentage of families and individuals below the poverty level are approximately 9 percent higher for the 4 potentially affected census tracts than for Fresno County. These levels are slightly higher than similar levels for Fresno County.

Whether these slightly lower incomes and higher poverty-level figures represent the potential for disproportionately high and adverse human health or environmental effects on low-income populations depends on weighing several factors, including the percentage of the following project costs that are expected to be spent in the 4 surrounding census tracts, such as:

- The KRCDPP initial capital cost, which is estimated at $40 million.

- The estimated value of materials and supplies that will be purchased locally (within Fresno County) during construction, which is expected to be about $2 million.
- The total local sales tax expected during construction, which is expected to be about $150,000 (i.e. 7.875 percent of local sales for Fresno County)
- The KRCDPP will provide about $4.5 million in construction payroll, at an average salary of $65 per hour (including benefits).
- There will be an additional annual operations payroll of $210,000 (3 operators at an average salary of $70,000 each, including benefits).

Additional construction jobs, income, and local spending may result from the proposed KRCDPP. Because these local economic benefits are speculative, and because potentially affected income levels are slightly lower, and poverty levels slightly higher than the corresponding levels for Fresno County, there will be a less than significant impact on the affected low-income population. This impact is less than significant because the 13 to 17 percent difference in income and the 9 percent difference in poverty levels is not so meaningfully disproportionate from the remainder of the county with respect to potentially adverse human health and environmental effects to warrant a higher level of significance, especially when considering the potential for increased local economic viability that may result from construction and O&M of the proposed KRCDPP.

### 5.12.6 Mitigation Measures

The proposed KCDPP would result in no significant impacts to socioeconomic resources, therefore no mitigation measures are proposed.

### 5.12.7 Cumulative Impacts

The construction and ongoing O&M of the proposed KRCDPP will have cumulatively beneficial socioeconomic impacts when considered in combination with past, present, and reasonably foreseeable future projects. The provision of 97 megawatts of electricity will increase local service reliability supporting existing and planned growth in employment and housing. Increased reliability will promote increased economic activity, which will eventually translate into a small increase in jobs, spending, and economic vitality for those persons and businesses benefiting from the increased payroll and secondary revenues derived from project construction and O&M.

### 5.12.8 References

California Employment Development Department (CEDD)

CEDD, 2003. Labor Market Information Division. Fresno MSA Industry Employment and Labor Force – by Annual Average. Updated May 7,2003. Website: http://www.calmis.ca.gov/htmlfile/subject/indtable.htm.

CEDD, 2002. County Snapshot, Fresno 2002a.

California Department of Finance (DOF)

DOF, 2002. Financial and Economic Data, California County Profiles, Fresno County Profile. Website: http://www.dof.ca.gov/HTML/FS_DATA/profiles/fresno.xls.

DOF, 2003a. Demographic Research Unit. Table 2: E-5 City/County Population and Housing Estimates, 1/1/2003 – Fresno County. Website: http://www.dof.ca.gov/HTML/DEMOGRAP/E-5text2.htm

ESA, 2003. Draft Proposed Malaga City Incorporation. Program Environmental Impact Report. June 13, 2003.

Fresno County, 2000a. Fresno County General Plan Background Report. Adopted October 3, 2000. General Plan Consultant Team & Fresno County Staff.

Fresno County, 2000b. County of Fresno General Plan Final Environmental Impact Report. August 2000. Fresno County Staff.

Fresno County Fire Protection District (FCFPD), 2003. Fire Stations Website at: http://www.fcfpd.org/.

Fresno County Sheriff's Department, 2003. Patrol Website at: http://www.fresnosheriff.org/index.html.

U.S. Census Bureau, 2000a. DP-1. Profile of General Demographic Characteristics: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. Geographic Area: Census Tract 12.01, Fresno County, California.

U.S. Census Bureau, 2000b. DP-1. Profile of General Demographic Characteristics: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. Geographic Area: Block 2030, Block Group 2, Census Tract 12.02, Fresno County, California.

U.S. Census Bureau, 2000c. DP-1. Profile of General Demographic Characteristics: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. Geographic Area: Census Tract 14.06, Fresno County, California.

U.S. Census Bureau, 2000d. DP-1. Profile of General Demographic Characteristics: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. Geographic Area: Census Tract 15, Fresno County, California.

U.S. Census Bureau, 2000e. Profile of General Demographic Characteristics: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. Geographic Area: Fresno County, California.

U.S. Census Bureau, 2000f. DP-3. Profile of Selected Economic Characteristics: 2000. Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Geographic Area: Census Tract 12.01, Fresno County, California.

U.S. Census Bureau, 2000g. DP-3. Profile of Selected Economic Characteristics: 2000. Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Geographic Area: Census Tract 12.02, Fresno County, California.

U.S. Census Bureau, 2000h. DP-3. Profile of Selected Economic Characteristics: 2000. Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Geographic Area: Census Tract 14.06, Fresno County, California.

U.S. Census Bureau, 2000i. DP-3. Profile of Selected Economic Characteristics: 2000. Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Geographic Area: Census Tract 15, Fresno County, California.

U.S. Census Bureau, 2000j. DP-3. Profile of Selected Economic Characteristics: 2000. Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Geographic Area: Fresno County, California.

U.S. Department of Commerce (DOC), 2001. Overview of Race and Hispanic Origin. Census 2000 Brief. Issued March 2001.

U.S. Environmental Protection Agency (USEPS), 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April 1998.

# SECTION 5.13 CULTURAL RESOURCES

## 5.13.1 Introduction

Cultural resources are historic and prehistoric archaeological sites, historic architectural and engineering features and structures, and sites and resources of traditional cultural significance to Native Americans and other groups. This section evaluates the potential for impacts to cultural resources that may result from construction or operation of the proposed King River Conservation District Peaking Plant (KRCDPP). Section 5.13.2 provides background information needed to place the proposed KRCDPP into its cultural resource setting. Section 5.13.3 describes the federal, state and local laws, ordinances, regulations, and standards (LORS) applicable to the protection of cultural resources. Section 5.13.3.4 lists involved agencies and agency contacts, Section 5.13.4.4 describes the cultural resources in the area, and Section 5.13.4 discusses the environmental consequences (impacts) of construction of the proposed KRCDPP. Section 5.13.5 presents mitigation measures that will be implemented to avoid impacts from construction of the proposed KRCDPP and associated linear facilities. Section 5.13.6 describes any cumulative impacts that might result from construction or operation and maintenance of the KRCDPP and Section 5.13.7 provides references cited or consulted.

## 5.13.2 Affected Environment

### *5.13.2.1 Project Area Setting*

The proposed KRCDPP is located within the southern San Joaquin Valley region of the Central Valley of California. The Fresno area, with its proximity to the San Joaquin and Kings Rivers, exhibits a rich abundance of alluvial plains, river channels, marshes and wetlands. Tulare Lake, one of the San Joaquin Valley's largest ancient lakes, is situated approximately 50 miles south of the City of Fresno.

The proposed KRCDPP, as described in further in Chapter 2, Project and Facility Description, includes the development of an approximately 97 megawatt (MW) natural gas-fired peaking power plant and associated linear facilities including interconnections for electric transmission, water, sewer and gas, as described later in this section. Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga, a small agricultural and industrial community located in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19 acre property and is located within the northeast one-quarter of Section 25, Township 14 South, Range 20 East, on the United States Geological Survey (USGS) 7.5 minute

Malaga Quadrangle map. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. An access road and right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

### *5.13.2.2 Native American Prehistory*

A three-part cultural chronological sequence, the Central California Taxonomic System (CCTS) was developed by archaeologists to explain local and regional cultural change in prehistoric central California from about 4,500 years ago to the time of European contact (Lillard, Heizer, and Fenenga, 1939; and Beardsley, 1948 and 1954). In 1969, several researchers met at University of California, Davis and worked out substantive taxonomic problems that had developed with the CCTS. The following discussion summarizes David Fredrickson's (1994) cultural periods model and provides CCTS classification nomenclature (such as "Early Horizon," etc.).

Professional or academic archaeological investigations of central California began in the 1930's when J. Lillard and W. Purves of Sacramento Junior College formed a field school. They conducted excavations throughout the Sacramento Delta area. By means of artifact and burial data, they identified a sequence of three phases ("Early," "Intermediate," and "Recent") similar to Barr's and Dawson's (Lillard and Purves 1936). In 1954, Richard Beasley refined this system and extended it to include the region of San Francisco Bay. The result was referred to as the "Central California Taxonomic System" or CCTS (Lillard, Heizer, and Fenenga, 1939; Moratto, 1984). The CCTS system was subsequently applied widely to site dating and taxonomy throughout central California.

Much of the subsequent archaeological investigation in the Central Valley focused on refining the CCTS through analysis of environmental change, settlement and subsistence strategy, exchange, population movement, and other related topics. These studies established subsequences for many regions of central California. The best received of these studies has been Fredrickson's (1973) concept of cultural patterns (Moratto, 1984). His idea was that widespread cultural patterns are identifiable in spite of the many local variations. According to Fredrickson, these patterns represent "adaptive modes" which extended across several regions and are characterized "by particular technological skills and devices, [by] particular economic modes, including participation in trade networks and practices surrounding wealth, and by particular mortuary and ceremonial practices" (Fredrickson, 1973).

Fredrickson's chronological sequence for central California begins with the Windmiller pattern, which possesses cultural elements that belong to both the Early and Middle Horizons. Sites from this period date from about 6,950 to 3,950 years ago. Earlier occupations no doubt existed. Sites from the Paleo-Indian period (dating from about 11,950 to 7,950 years ago) are thought to be buried beneath Holocene alluvial deposits. This would explain why they are not well documented in this part of California (Ragir, 1972).

Some scholars have suggested that sites of the Windmiller pattern are associated with an influx of people from outside of California who introduced subsistence patterns adapted to riverine and wetland environments (Moratto, 1984). They are often situated in riverine, marshland, or valley floor settings, as well as atop small knolls above prehistoric seasonal floodplains. Such areas provided a wide variety of plant and animal resources. Windmiller sites have characteristic burial patterns: they contained burials with remains that are extended ventrally, oriented to the west, and interred with copious amounts of mortuary artifacts. The artifacts often include large projectile points and a variety of fishing paraphernalia – net weights, bone hooks, and spear points. Faunal remains from Windmiller sites indicate that the inhabitants hunted a range of large and small mammals. Stone mortars and grindstones for seed and nut processing are common finds. Other artifacts – such as charmstones, ochre, quartz crystals, and both *Olivella* and *Haliotis* shell beads – suggest ceremonialism and trade.

The subsequent Berkeley pattern (previously included in the Middle Horizon) covers a period from about 3,500 to 1,500 years ago in the San Francisco Bay region. At the beginning of the sequence, this pattern shares some attributes with the Windmiller pattern, and at the end of the period it has traits associated with the Late Horizon. Berkeley pattern sites are much more common and well documented, and therefore better understood, than Windmiller sites. These sites are scattered in more diverse environmental settings, but riverine settings are prevalent.

Deeply stratified midden deposits that form over generations of occupation are typical of Berkeley pattern sites. The middens contain numerous milling and grinding stones for food preparation. Projectile points become progressively smaller and lighter over time, culminating in the introduction of the bow-and-arrow during the Late Prehistoric period. Slate pendants; steatite beads; stone tubes; ear ornaments; and burial practices that utilize variable directional orientation, flexed body positioning, and a general reduction of mortuary goods are unique to Berkeley pattern sites (Fredrickson, 1973; Moratto, 1984).

The Late Prehistoric period (formerly the Late Horizon) ranges from about 950 to 150 years ago. This period coincides with Fredrickson's Augustine pattern, which is typified by intensive fishing, hunting, and gathering (especially acorns); a large population increase; expanded trade and exchange networks; increased ceremonial and social attributes; and the practice of cremation in addition to flexed burials. Certain artifacts are also distinctive in this pattern: bone awls used in basketry; small notched and serrated projectile points that are indicative of bow-and-arrow usage; occasional pottery; clay effigies; bone whistles; and stone pipes. The Augustine pattern and the Late Prehistoric period are recognized as the apex of Native American cultural development in this part of California. Further analysis of the various cultural interrelationships can be found in Hughes (1994), Fredrickson (1973), and Elsasser (1978).

Another scheme proposed by Chartkoff and Chartkoff (1984) is also used by archaeologists. The Chartkoff and Chartkoff (1984) Model of Cultural Periods in California include the Pre-Archaic (Pre-Archaic Period-11,500-9,000 B.C.) characterized by small populations who based their subsistence on big game hunting of now extinct mammoth and mastodon. Research indicates that the Pre-Archaic economies were based on a wide-ranging hunting and gathering strategy, dependent to a large extent on local lake-marsh or lacustrine habitats. During the Early and Middle Archaic periods (Early to Middle Archaic Period - 9,000-4,000 B.C.), prehistoric cultures began to put less emphasis on large-game hunting. Subsistence economies probably diversified somewhat, and Archaic era people may have started using such ecological zones as the coast littoral more intensively than before. Advances in technology (milling stones) indicate that new food processing methods became important, enabling more efficient use of certain plant foods, including grains and plants with hard seeds.

During the Late Archaic Period (Late Archaic Period - 4,000-2,000 B.C.), an important technological advance was the discovery of a tannin-removal process for the abundant and nutritious acorns. Prehistoric trade networks developed and diversified, bringing raw materials and finished goods from one region to another. Resource exploitation, as during the Early and Middle Archaic, was generally seasonal. Bands moved between established locations within a clearly defined/defended territory, scheduling resource harvests according to their availability. Clustering of food resources along the shores of large lakes or the banks of major fish-producing rivers allowed for larger seasonal population aggregates. Dispersed resources, such as large and small game, during the winter prompted small family groups to disperse across the landscape for more efficient food harvesting. The spear thrower (atlatl) may have been introduced or increased in importance, accounting for a change in projectile point styles from the Western Stemmed to the Pinto and Humboldt series. Seed grinding increased in importance.

The Pacific Period (Early and Middle Pacific Periods - 2,000 B.C.-A.D. 500) is marked by the advent of acorn meal as the most important staple food. Increasing population densities made it desirable and necessary for Indian populations to produce more food from available land and to seek more dependable food supplies. The increasing use of seed grinding and acorn leaching allowed for the exploitation of more dependable food resources; increased use of previously neglected ecological zones (the middle and high Sierran elevations) may also have been part of this trend. Sometime during the Late Pacific Period – A.D. 500-1400, a cultural watershed was triggered by the introduction of the bow and arrow, which replaced the spear thrower and dart as the hunting tool/weapon of choice. The most useful time markers for this period tend to be small projectile points/arrow tips. Another trend is the marked shift from portable manos/metates to bedrock mortars/pestles (Moratto, 1984). Moratto, et al. (1978) demonstrated that this was a time of cultural stress, during which trading activity abated, warfare was common, and populations shifted away from the Sierra Nevada foothills to higher mountain elevations. Moratto, et al. (1978) explains these changes in terms of rapid climatic fluctuations, including a drier climate and a corresponding shift of vegetation zones.

Populations became increasingly sedentary during the Final Pacific Period (Final Pacific Period - A.D. 1400-1789), and depended more on staple foods, even as the diversity of foods exploited increased. Permanent settlements with high populations were more common. Every available ecological niche was exploited, at least on a seasonal basis. Other trends included the resurgence of long-distance trade networks and the development of more complex social and political systems.

Moratto (1984) suggests the Early Horizon dated to ca. 4,500 to 3,500/3,000 years ago with the Middle Horizon dating to ca. 3,500 to 1,500 years ago and the Late Horizon dating to ca. 1,500 to 250 years ago. The Early Horizon is the most poorly known of the period with relatively few sites known or investigated. Early Horizon traits include hunting, fishing, use of milling stones to process plant foods, use of a throwing board and spear (atlatl), relative absence of culturally affected soils (midden) at occupation sites, and elaborate burials with numerous grave offerings. Middle Horizon sites are more common and usually have deep stratified deposits that contain large quantities of ash, charcoal, fire-altered rocks, and fish, bird and mammal bones. Significant numbers of mortars and pestles signal a shift to plant foods from reliance on hunted animal foods. Middle Horizon peoples generally buried their dead in a fetal position and only small numbers of graves contain artifacts (and these are most often utilitarian). Increased violence is suggested by the number of burials with projectile points embedded in the bones or with other marks of violence.

The Late Horizon emerged from the Middle Horizon with continued use of many early traits and the introduction of several new traits. Late Horizon sites are the most common and are noted for their greasy soils (midden) mixed with bone and fire-altered rocks. The use of the bow-and-arrow, fetal-position burials, deliberately damaged ("killed") grave offerings and occasional cremation of the dead are the best known traits of this horizon. Acorn and seed gathering dominated the subsistence pattern with short and long-distance trade carried out to secure various raw materials. Compared to earlier peoples, Late Horizon groups were short in stature with finer bone structure; evidence perhaps of the replacement of original Hokan speaking settlers by Penutian speaking groups by ca. 1,500 years ago.

#### *5.13.2.3 Ethnography*

Archaeological sites in the San Joaquin Valley indicate that it has been occupied, at least intermittently, for the past 5,000 years or longer (Moratto, 1984). The ethnographic inhabitants of the area were the Southern Valley Yokut Indian group who are known to have established semipermanent villages in the vicinity of the proposed KRCDPP (Kroeber, 1970). Unique among Native Californians, the Southern Yokuts are divided into true tribes, each with a name, a dialect, and a geographical territory. Yokuts people spoke in excess of 30 dialects of Yokuts language, part of the Penutian linguistic stock. Considering the geographical expanse of their territory, the Yokuts dialects were quite homogeneous and members of distant tribes could converse and understand each other. This linguistic capacity was unparalleled for any similar distance in California (Kroeber, 1925:477). The approximately 50 tribes of Yokuts, each with 300 to 400 persons, lived in the 250-mile long San Joaquin Valley as far north as where the San Joaquin River empties into the Sacramento and as far south as the foot of the Tehachapi Mountains (Emanuels, 1992:119). The exact boundaries of the Yokuts are still a matter of controversy, especially between the Plains division and the adjacent Miwoks (Kroeber, 1970:442). The Yokuts have been separated into three cultural-geographical divisions: Northern Valley, Southern Valley, and Foothills. Each of the Yokuts tribes were autonomous units, none being subordinate to any other tribe. Cook (1955) estimates the number of Valley Yokuts (Northern and Southern) in the 18th century as approximately 41,000 persons, which makes them the largest pre-contact ethnic group in California (Moratto, 1984:173). The Southern Valley Yokuts territory comprised Tulare, Buena Vista, and Kern lakes and the lower portions of the Kings, Kaweah, Tule and Kern rivers.

Although each tribal group had one or more permanent villages, their territory contained numerous smaller campsites used during seasonal rounds of resource exploitation. Because tule grew profusely in their territory along the small creeks, streams and rivers, many extended families lived in lodges of woven tule. Often they built their villages in

street-like order (Emanuels, 1992:127). Ceremonial semi-subterranean men's houses (called "sweathouses" by the Spanish) were built at the larger village sites also using grass and earth cover (Kroeber, 1970). Given an abundant and continuous subsistence base, ceremony in Yokut life was fairly extensive, and scholars have written much about it based on early ethnographic accounts (Bennyhoff, 1994; Kroeber, 1970; Levy, 1978).

Rituals associated with death were of great importance. Two forms of interment were practiced and mortuary goods were often placed into the grave at the time of burial. Cremation was also occasionally practiced, especially for those who died away from home so that the ashes might be transported for burial. Personal possessions were sometimes burned and the house of death was customarily abandoned. The ashes and unburned bones were gathered and placed in water, or else buried in a basket in the local cemetery (Wallace, 1978).

The area of the proposed KRCDPP would have provided an excellent location for seasonal resource procurement camps. Tule or balsa canoes were used to navigate rivers and lakes and for hunting and gathering forays into the San Joaquin Valley delta. Scholars have suggested the early California environment offered a large assortment of resources for use by native people, although acorns, fish, and game mammals formed the staples of their diet (Baumhoff, 1963). Plant foods in great variety were gathered as they came into season with wild seeds and roots providing a large portion of the sustenance. A starchy flour for mush was prepared from dried and pounded tule roots. The various foodstuffs were cooked in different ways. Ground tule root was mixed with water and hot stones were placed in the basket to heat it. Meat and fish were broiled on coals or roasted in ashes. Salt derived from salt grass seasoned many dishes (Wallace, 1978:450).

#### *5.13.2.4 Euro-American History*

The Yokuts living in the southern San Joaquin Valley rapidly disappeared as a result of contact with European explorers and settlers. Diseases, declining birth rates, and the effects of the mission system served to largely eradicate the aboriginal lifeways. The first Europeans to explore the area were the Spanish looking for inland mission sites. The Southern Valley Yokuts were encountered by the Spaniards in the fall of 1772, when Pedro Fages led a small band of soldiers through Tejon Pass and down into the southernmost part of the San Joaquin Valley. The Spanish named the low-lying portion of the San Joaquin Valley "Los Tulares", hence the appellation "Tulareños" by which the Yokuts were known (Kroeber, 1970:476). In 1829 Mexican forces quelled conflicts between the missionaries and native populations. These troops controlled the area until the Mexican-American War ended 1848 and Mexico ceded California to the United States. By the mid 1800s the Yokut population was nearly extinct due to diseases and

pressures brought by the influx of missionaries and miners since the beginning of the 19th century (Wallace, 1978).

Historic settlement of the region by Euro-Americans comprised cattle ranching, agriculture, orchards, and similar land use. Fresno County was organized in 1856 from Mariposa, Merced, and Tulare counties. Fresno is Spanish for 'ash tree' and was first applied to the Fresno River (Kyle, 1990:85). The Kings River rises in the High Sierra and flows through Fresno County. Spanish explorer Gabriel Moraga discovered the river on January 6, 1805, the Feast of the Three Kings, and named the river in their honor. American explorers in Fresno County include Jedediah Strong Smith, the first American to arrive in California overland, in 1826. Fresno City was established about 1858 at the head of navigation on Fresno Slough. At certain times of the year, especially in years of heavy rain and flooding, the San Joaquin River could be navigated well into the valley by vessels of very shallow draft (Kyle, 1990:87). Today, Fresno is the largest city in the San Joaquin Valley. It pioneered the development of gravity irrigation, which changed arid land into fertile farms. Fresno County is one of the nation's leading producers of grapes, raisins, figs, and cotton. The small Community of Malaga, southeast of the City of Fresno, established its post office in 1885. Named for the Malaga grape, which is grown commercially in the district was in turn named for the city of Málaga in Spain (Gudde, 1974). Originally known as Malaga Colony, it was established by the pioneer raisin grower of the State, G.G. Briggs. The raisin industry began in the adjacent Central California Colony vineyards when, in the summer of 1875, the scorching sun dried out the grapes on the vine (Kyle, 1990).

### 5.13.3 Laws, Ordinances, Regulations, and Standards

This section includes a discussion of the LORS applicable to the proposed KRCDPP. Federal regulations that generally apply to federal undertakings and which do not apply to the proposed KRCDPP are included in this section for reference and for completeness.

#### *5.13.3.1 Federal (for reference only)*

Archaeological and architectural resources (buildings and structures) are protected through the National Historic Preservation Act of 1966 (NHPA) (16 United States Code (USC) Section 470f) and its implementing regulations, which include the Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979 (ARPA). Section 106 of the NHPA requires applicable federal agencies prior to implementing an "undertaking" (e.g., issuing a federal permit), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Office (SHPO) a reasonable opportunity to comment on any

undertaking that would adversely affect properties eligible for listing on the National Register of Historic Places (NRHP). Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the NRHP.

Under the NHPA, a find is significant if it meets the NRHP listing criteria at 36 CFR 60.4, which includes:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- That are associated with events that have made a significant contribution to the broad patterns of our history, or
- That are associated with the lives of persons significant in our past, or
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
- That has yielded, or may be likely to yield, information important in prehistory or history.

Cultural institutions, lifeways, culturally valued viewsheds, places of cultural association, and other valued places and social institutions must also be considered under the National Environmental Protection Act (NEPA), Executive Order 12898 as well as other applicable authorities including Executive Order 13006, Executive Order 13007, and the Native American Graves Protection and Repatriation Act (NAGPRA).

The American Indian Religious Freedom Act of 1978 (AIRFA) allows access to sites of religious importance to Native Americans. On federal land, ARPA and NAGPRA would apply. ARPA assigns penalties for vandalism and the unauthorized collection of archaeological resources on federal land and provides for federal agencies to issue permits for scientific excavation by qualified archaeologists. NAGPRA assigns ownership of Native American graves found on federal land to their direct descendants or to a culturally affiliated tribe or organization and provides for repatriation of human remains and funerary items to identified Native American descendants.

If any federal permits are required for a project then the NHPA and its implementing regulations (16 USC 470 et seq., 36 CFR 800, 36 CFR 60, and 36 CFR 63) will also apply. The NHPA establishes the federal government's policy on historic preservation and the programs, including the NRHP, through which that policy is implemented. Under the NHPA, historic properties include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP" (16 USC 470w (5)).

No federal LORS are applicable to the proposed KRCDPP.

### *5.13.3.2 State*

The California Environmental Quality Act (CEQA) requires a determination if a proposed project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or ethnic group. A historical resource for the purposes of CEQA compliance is defined as a resource listed in, or determined eligible for listing in the California Register of Historic Resources (CRHR). The CRHR lists properties that are to be protected from substantial adverse change and includes properties, which are listed or have been formally determined to be eligible for listing in the NRHP, State Historic Landmarks, and eligible Points of Historical Interest (California Department of Parks and Recreation, Office of Historic Preservation, 1997).

#### Historical Resources

CEQA applies to discretionary projects and equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the CRHR is presumed to be historically or culturally significant.

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not. A resource that is not listed in or determined to be eligible for listing in the CRHR, not included in a local register or historic resources, or not deemed significant in a historical resource survey may nonetheless be historically significant (Section 21084.1). Public Resources Code (PRC) Section 21098.1 stipulates that:

"A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment."

For the purposes of this section, a historical resource is a resource listed in, or determined to be eligible for listing in, the CRHR. Historical resources included in a local register of historical resources, as defined in subsection (k) of Section 5020.1, are presumed to be historically or culturally significant for purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the CRHR, not included in a local register or historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1 shall not preclude a lead agency from determining whether the resource may be a historical resource for purposes of this section.

PRC Sections 5020.1 and 5024.1 provide the following definitions:

**Historic district** - a definable unified geographic entity that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

**Historical landmark** - any historical resource that is registered as a state historical landmark pursuant to Section 5021.

**Historical resource** - includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic agricultural, educational, social, political, military, or cultural annals of California.

**Local register of historic resources** - a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

**Substantial adverse change** - demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

**Archaeological Resources**

New CEQA guidelines became effective January 1, 1999. Where a project may adversely affect a unique archaeological resource, Section 21083.2 requires the Lead Agency to treat that effect as a significant environmental effect and prepare an Environmental Impact Report (EIR). When an archaeological resource is listed in, or eligible to be listed in, the CRHR, Section 21084.1 requires that any substantial adverse effect to that

resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a proposal may have a potential adverse effect on archaeological resources.

PRC 21083.2 (g) defines a unique archaeological resource to be:

An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
(2) has a special and particular quality such as being the oldest of its type or the best available example of its type; or
(3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

Section 21084.1 requires treatment of any substantial adverse change in the significance of a historical resource listed in or eligible to be listed in the CRHR as a significant effect on the environment. A historical resource can be an archaeological resource listed in or formally determined eligible for listing in the CRHR and by reference, the NRHP, California Historical Landmarks, Points of Historical Interest, and local registers (see Section 5020.1 and 5024.1).

To resolve conflicts between the narrow and limiting statutory provision for mitigation of archaeological resources and the broadly protective statutory provision for determining the significance of historical resources, Section 15064.5 provides that to the extent an archaeological resource is also a historical resource, the provisions regarding historical resources apply. These new provisions endorse the first set of standardized mitigation measures for historic resources by providing that projects following the Secretary of the Interior's Standards for Treatment of Historic Properties shall be considered as mitigated to a less-than-significant level. Other provisions put lead agencies on notice that, in many circumstances, the very popular method of mitigating impacts on historical resources by way of documentation (e.g., narrative, photographs, architectural drawings) will not mitigate the effects to a point where clearly no significant effect on the environment would occur. In Section 15331, a new categorical exemption is added for projects limited to restoration or rehabilitation of historic resources consistent with the Secretary of the Interior's Standards (Gorsen, 1999).

**Other California Laws and Regulations - Native American Burials**

Other state requirements for cultural resources management are written into the California PRC Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency. The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the PRC and fall within the jurisdiction of the Native American Heritage Commission (NAHC). If human remains are discovered, the County Coroner must be notified within 24 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98 will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

### *5.13.3.3 Local*

Programs of cultural and historic preservation exist at the county level and are linked with those of cities and with state and federal preservation programs. The following local LORS are applicable to the proposed KRCDPP.

**County of Fresno**

The County of Fresno's Draft General Plan and EIR (County of Fresno, 2000) addresses potential impacts of future development on historical and prehistoric resources in the County. The Draft General Plan contains the following policies aimed at preserving and protecting cultural resources. These policies seek to preserve the historical, archeological, paleontological, geological, and cultural resources of the county through development review, acquisition, encouragement of easements, coordination with other agencies and groups, and other methods.

Goal OS-J:

To identify, protect, and enhance Fresno County's important historical, archeological, paleontological, geological, and cultural sites and their contributing environment.

Policy OS-J.1:

The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect important historical, archeological, paleontological, and cultural sites and their contributing environment from damage, destruction, and abuse

to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives to preserve archeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

Policy OS-J.2:
The County shall, within the limits of its authority and responsibility, maintain confidentiality regarding the locations of archeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

Policy OS-J.3:
The County shall solicit the views of the local Native American community in cases where development may result in disturbance to sites containing evidence of Native American activity and/or sites of cultural importance.

Policy OS-J.4:
The County shall maintain an inventory of all sites and structures in the County determined to be of historical significance (Index of Historic Properties in Fresno County).

Policy OS-J.5:
The County shall support the registration by property owners and others of cultural resources in appropriate landmark designations (i.e., NRHP, California Historical Landmarks, Points of Historical Interest, or Local Landmark).

Policy OS-J.6:
The County shall provide for the placement of historical markers or signs on adjacent County roadways and major thoroughfares to attract and inform visitors of important historic resource sites. If such sites are open to the public, the County shall ensure that access is controlled to prevent damage or vandalism.

Policy OS-J.7:
The County shall use the State Historic Building Code and existing legislation and ordinances to encourage preservation of cultural resources and their contributing environment.

Policy OS-J.8:
The County shall support efforts of other organizations and agencies to preserve and enhance historic resources for educational and cultural purposes through maintenance and

development of interpretive services and facilities at County recreational areas and other sites.

Policy OS-J.9:
In approving new development, the County shall ensure, to the maximum extent practicable, that the location, siting, and design of any project be subordinate to significant geologic resources.

Policy OS-J.10:
The County shall encourage property owners to enter into open space easements for the protection of unique geologic resources.

Policy OS-J.11:
The County shall consider purchasing park sites for the purpose of preserving unique geologic resources for public enjoyment.

Policy OS-J.12:
The County should encourage the inclusion of unique geologic resources on the National Registry of Natural Landmarks.

Policy OS-J.13:
The County shall encourage State and Federal agencies to purchase significant geologic resources for permanent protection.

**Implementation Programs**

Program OS-J.A:
The County shall adopt and implement an ordinance to protect and preserve significant archaeological, historical, and geological resources. The ordinance shall provide for implementation of applicable development conditions, open space easements, tax incentives, related code revisions and other measures as needed.

**City of Fresno**

The City of Fresno's General Plan (City of Fresno, 2002) describes cultural resources within the Fresno area and establishes policies and programs to protect and maintain cultural resources. The purpose of the Preservation of Historic Structures Ordinance in 1979 (amended in 1981) is to promote the protection, enhancement, perpetuation and use of structures that represent past eras, events, and persons important in history, or which provide significant examples of architectural styles of the past or are landmarks in the history of architecture, or which are unique and irreplaceable assets to the City and its

neighborhoods, or which provide for this, and future generations, examples of the physical surroundings in which past generations lived.

#### *5.13.3.4 Involved Agencies and Agency Contacts*

Table 5.13-1 lists the state agency involved in cultural resources management for the KRCPDP Project and the appropriate contact person.

**Table 5.13-1**
**Agency Contacts**
**KRCDPP**

| Issue | Agency Name/Address | Telephone |
|---|---|---|
| Native American traditional cultural properties | NAHC<br>915 Capitol Mall, Room 364<br>Sacramento, CA 95814 | (916) 653-4040 |

#### *5.13.3.5 Permits Required and Permit Schedule*

No permits are expected to be required.

### 5.13.4 Environmental Consequences

#### *5.13.4.1 Environmental Checklist*

This analysis assesses the significance of any cultural resources potentially affected by the proposed KRCDPP and proposes appropriate measures to mitigate potential adverse effects. The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the California Energy Commission (CEC) to assess the potential for significant impact to cultural resources. This section discusses the potential for significant impacts associated with construction and operation of the proposed KRCDPP in relation to the checklist questions in Table 5.13-2, below.

**Table 5.13-2**
**CEQA Environmental Checklist – Cultural Resources**
**KRCDPP**

| V. CULTURAL RESOURCES – Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | | | | X |
| b) Cause a substantial adverse change in the significance of an archaeological resource | | X | | |

| | | | | |
|---|---|---|---|---|
| pursuant to §15064.5? | | | | |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | | X | | |

### *5.13.4.2 Impacts Assessment Methodology*

This cultural resources assessment was directed by William Self, William Self Associates, Inc. (WSA). Mr. Self meets the Standards and Guidelines for Archaeology and Historic Preservation (National Park Service, 1983). A copy of Mr. Self's resume is included as Appendix 5.13.12 This study was performed consistent with CEQA compliance procedures and Section 106 of the NHPA set forth at 36 CFR Section 800. The study scope was also developed in accordance with Instructions to the CEC Staff for the Review of and Information Requirements for an Application for Certification (CEC, 1992) and Rules of Practice and Procedure & Power Plant Site Certification Regulations (CEC, 1997).

Significant cultural resources which could be present in the KRCDPP project area (and as defined for federal undertakings) include: prehistoric, historic and archaeological sites, districts, buildings, structures, and objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and culture. Historic properties include so-called "traditional cultural properties." Significant cultural resources also include Native American cultural items or sites, including human or skeletal remains, funerary items, or sacred items with traditional religious or cultural importance which are listed, or are eligible for listing, on the NRHP, according to the criteria outlined in 36 CFR 60.4, and archaeological sites or other cultural resources including cultural institutions, lifeways, culturally valued viewsheds, places of cultural association, and other valued places and social institutions. Cultural resources that may qualify for the CRHR are also considered under CEQA. Any substantial adverse change in the significance of a historical resource listed in or eligible to be listed in the CRHR is considered a significant effect on the environment under CEQA.

Impacts to cultural resources would result from activities that affect the characteristics that qualify a property for the NRHP or substantially adversely change the significance of a resource that is qualified to be listed in the CRHR. Therefore, impacts to cultural resources from the proposed KRCDPP will be considered significant if the KRCDPP:

- Physically destroys or damages all or part of a property;
- Changes the character of the use of the property or physical features within the setting of the property, which contribute to its historic significance;

- Introduces visual, atmospheric, or audible elements that diminish the integrity of the significant historic features of a property. With the exception of isolated artifacts or features that appear to lack integrity or potentially important information, all new cultural resource findings would be treated as though they are eligible for the NRHP/CRHR.

If possible, all recorded resources will be avoided completely. However, if avoidance is not possible through KRCDPP redesign, the significance of the affected resources will be evaluated formally using NRHP/CRHP and/or CEQA criteria and guidelines. If a resource is determined to be significant, a data recovery program or some other appropriate mitigative effort will be undertaken.

The proposed KRCDPP will not require the involvement of any federal agencies.

#### *5.13.4.3 Records Search and Results*

This study relies upon available information and a field inventory of the area of the proposed KRCDPP. Contact with the NAHC did not result in the identification of traditional cultural properties in the area. A copy of the letter sent to the NAHC is included as Appendix 5.13-1. A record search of the KRCDPP area was also conducted on October 7, 2003, at the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield (SSJVIC File No. 03-273). The search included the immediate area of the KRCDPP and area within a one-mile radius of the KRCDPP. Previous archaeological and historical studies, including field survey reports and archaeological site records, were also accessed for the area. Records were also reviewed in the Directory of Properties in the Historic Property Data File for Fresno County for information on sites of recognized historical significance within the NRHP, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992). The Caltrans State and Local Bridge Survey (1989), and relevant GLO Plats were also consulted for the area.

The search resulted in the following findings:

- No prehistoric or historic archaeological cultural resources or historic properties have been reported to the SSJVIC within the area of the KRCDPP.
- No prehistoric sites have been reported within the one-mile radius of the KRCDPP.

- No historic sites have been reported within the immediate area of the KRCDPP; however, one has been reported within a one-mile radius, P-10-004667, the Golden State Boulevard Bridge (Caltrans Bridge No. 42C0084).
- There has been one previous cultural resource study conducted within a portion of the area of the KRCDPP with negative results (Bissonnette, 1992).
- There have been five previous surveys conducted within a one-mile radius of the KRCDPP with negative results (Billat ND; Hatoff, et al., 1995; Love and Tang, 2001; Nelson, 2000; and Sutton, 1989).
- No NRHP sites, CRHR sites, properties determined eligible for either register, or State Points of Historical Interest were found within the KRCDPP area or one-mile radius.

The record search conducted at the SSJVIC of the California Historical Resources Information System (CHRIS) revealed that no historic or archaeological sites are recorded at the either the KRCDPP project site or in the area of the proposed linear facilities and that no known/recorded Native American traditional cultural properties are present. Although no known/recorded sites are present, it is possible that presently undetected archaeological sites could be affected by the proposed KRCDPP.

#### *5.13.4.4 Field Survey*

WSA senior archaeologist, Leigh A. Martin, M.A., RPA, completed an intensive pedestrian archaeological survey, on September 16, 2003 using 15-meter transects. A copy of Ms. Martin's resume is included as Appendix 5.13-2. The 9.5 acre KRCDPP project site and adjacent construction staging and parking area is currently zoned industrial and is located at 2611 East North Avenue (Assessor Parcel Number 330-050-23S). It is bounded on the north by East North Avenue, on the south by the Union Pacific Railroad spur tracks, on the east by a cyclone fence with barbwire surrounding a vacant truck repair warehouse and the Fresno Irrigation District Central Canal, and on the west by an open field and abandoned cottonseed delinting plant.

In addition, the proposed and alternative sewer and water interconnection, the electrical transmission line, and gas interconnection were also surveyed, as described below.

The objective of the cultural resource survey was to evaluate the KRCDPP project area for the presence of prehistoric or historic site indicators, such as charcoal, obsidian or chert flakes, grinding bowls, shell fragments, bone, and pockets of dark, friable soils (for prehistoric sites), and glass, metal, ceramics, brick, wood and similar debris (for historic sites). Ground visibility ranged from poor to fair (less than 5% to approximately 30%) due to vegetation cover (native and non-native grassland). Trowel or foot clearing was

used to displace vegetation occasionally to improve ground visibility, and squirrel holes and back dirt mounds inspected for potential subsurface cultural deposits. Native soils that were observed have been graded and tilled in conjunction with previous agricultural activities. The soil in the area is characterized by a surface layer ranging from 8 to 18 inches of predominantly fine sandy loam. Soil characteristics are discussed further in Section 5.6, Agriculture and Soils.

The KRCDPP project area is situated at an elevation of ± 250 feet above sea level. As previously described, an existing 4-acre storm water basin is located to the north of the project site. Originally used as a borrow pit, the basin is located approximately 400 feet south of East North Avenue and contains a small grove of cottonwood trees at the eastern end. An exit channel drains winter run-off water south from the basin just outside the west boundary of the project area. The USGS 7.5' Malaga (1964 Photorevised 1981) topographic quadrangle depicts three structures located in the southwest portion of the project area and a small road leading from East North Avenue. With the exception of broken concrete slabs and a few fragments of water pipe, which do not appear to be over 45 years old, no evidence of these structures remains. No prehistoric or historic cultural resources were observed within the area.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. Both the preferred and alternative routes for the water and sewer interconnection were surveyed. The preferred interconnection would include a linear running east from the project site and through an open dirt field for a distance of approximately 750 feet to Chestnut Avenue. For survey and assessment purposes of the preferred interconnection, it was assumed that impacts would be limited to the Area of Potential Effect (APE), defined as a 100-foot wide area (50 feet on either side of the pipeline centerline to allow for construction equipment and disturbance). No structures will be impacted as a result of this route and no cultural resources were observed during the WSA survey. No additional cultural resources were observed during the WSA survey.

The secondary alternative would be to interconnect at the intersection of North and Chestnut. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues. A vacant diesel truck maintenance facility dating from the 1950s is located adjacent to the proposed route at 2635 East North Avenue. The facility consists of a truck maintenance building and two

modern storage warehouses (constructed in the 1970s). Construction impacts will be limited to the existing right-of-way of East North Avenue and the intersection of Chestnut and East North Avenues, consequently no impact will occur to the vacant truck facility. No additional cultural resources were observed during the WSA survey. Both the preferred and alternative interconnections would require a construction bore under the Central Canal to reach its destination.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears, as described in the above paragraphs.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line. Construction impacts will be limited to the existing right-of-way of North Avenue, consequently no impact will occur to any existing structures of the vacant truck facility, or residences located on North Avenue. No additional cultural resources were observed during the WSA survey.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. No additional cultural resources were observed during the WSA survey.

The historic built environment adjacent to the KRCDPP project area includes 5 residences located east of the project site along Chestnut Avenue and 8 residences and a

church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the Malaga Substation located on the northeast intersection of North and Willow Avenues. There will be no potential impacts to existing structures by the proposed KRCDPP.

#### *5.13.4.5 Native American Consultation*

The NAHC in Sacramento was contacted on September 8, 2003, by letter with a description of the proposed KRCDPP and a request for a listing of local, interested Native American Representatives and information on traditional or sacred lands within the area of the proposed KRCDPP. Debbie Pilas-Treadway from the NAHC responded to the request, noting a "search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area". A copy of the letter sent to the NAHC and the response letter are included in Appendix 5.13-1.

The NAHC provided WSA with the names of individuals that should be contacted for further information. These contact include Mr. Clarence Atwell, Tribal Chairperson of the Santa Rosa Rancheria, an individual of the Tache/Tachi/Yokut heritage; and Ms. Lee Ann Walker Grant, Chairperson of the Table Mountain Rancheria, an individual of Yokut heritage. Both Mr. Atwell and Ms. Grant were contacted by letter on October 2, 2003. A copy of the letter is included in Appendix 5.13-1. As of November 18, 2003, no responses have been received.

#### *5.13.4.6 Discussion of Impacts*

As proposed, the KRCDPP will have no impact to known/recorded archaeological resources. It is possible that currently unknown or unrecorded archaeological resources could be encountered during subsurface construction that penetrates native soils. Mitigation measures described below would reduce such possible impacts to archaeological resources to a less-than-significant level. Possible impacts to the historic built environment are not yet determined.

### 5.13.5 Proposed Mitigation Measures

The preferred mitigation is to avoid impact to cultural resources that may be located in the area of the KRCDPP. Avoidance can be accomplished by having the archaeologist and KRCDPP engineer demarcate cultural resource site boundaries on the ground to ensure that construction activities do not impinge on the resource(s). Where a transmission tower, road, pipeline or other facility must be placed within 100 feet of a known archaeological site, the site can be temporarily fenced or otherwise marked on the ground as an Environmentally Sensitive Area (ESA). Construction equipment can then be directed away from the ESA, and construction personnel directed to avoid entering the

ESA. In some cases, additional archaeological work will be needed to better delineate ESA boundaries. Prior to starting construction near a designated ESA, the construction crew should be informed of the resource values involved and of the regulatory protections afforded to the resources. The crew can also be informed of procedures relating to designated ESAs and cautioned not to drive into these areas to park or operate construction equipment on them. The crew can be cautioned not to collect artifacts and asked to inform their supervisor, should cultural remains be uncovered.

Though no known/recorded archaeological or historical sites are present within the footprint of the proposed KRCDPP, it is possible that subsurface construction could encounter buried archaeological remains. Since prehistoric archaeological sites and isolated artifacts have been found in the general vicinity, monitoring of subsurface construction is recommended. The recommended monitoring can be conducted on a part-time basis, to be determined at the discretion of the assigned Project Archaeologist (PA) The PA or his/her designated Archaeological Monitor (AM) should conduct the recommended construction monitoring.

Proper qualifications for a PA are the minimum qualifications for Principal Investigator on federal projects under the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. The AM should have 5 years of experience in conducting archaeological field projects or hold a Bachelor of Arts degree in anthropology, with an emphasis in archaeology, and have at least 1 year of experience in conducting archaeological field projects. The AM should be qualified to detect archaeological deposits in the field. In addition to site detection, the PA should be qualified to evaluate the significance of the deposits, consult with regulatory agencies, and plan site evaluation and mitigation activities.

If archaeological site testing and/or data recovery operations are triggered as a consequence of prehistoric archaeological remains being discovered during construction, it is recommended that a Native American monitor be present. Selection of the participating Native American should be made through the NAHC, and the Native American monitor could be retained either directly by KRCD or through the subconsultant conducting the actual archaeological fieldwork. If appropriate, a six-point archaeological monitoring program would be implemented as follows:

**1. Preconstruction Assessment and Construction Training**

The PA and AM will visit the area before construction begins to become familiar with site conditions. As construction begins, the PA will conduct a worker education session for construction supervisory personnel to explain the importance of, and legal basis for,

the protection of significant archaeological resources. Subsequent training sessions may be in the form of a video. Information about archaeological resources may be combined with information about cultural resources in the training brochure that will be distributed to construction supervisory personnel.

**2. Construction Monitoring**

The AM should be present at the construction site at all times when the PA determines there may be a potential for encountering buried resources. The AM's role will be to watch for buried archaeological deposits during excavation for roads, natural gas, sewer and water pipelines and during at-grade construction of electrical transmission poles. If the AM identifies archaeological remains during construction, the AM should immediately notify the PA and the Superintendent, who should halt construction in the immediate vicinity of the find, as necessary. The Superintendent and AM will use flagging tape, rope, or other means to delineate the area of the find within which construction will halt. This area should include the excavation trench from which the archaeological finds came and any piles of dirt or rock spoil from that area. Construction should not take place within the delineated find area until the PA can inspect and evaluate the find and consult with appropriate individuals.

**3. Site Recording and Evaluation**

The PA and/or AM should follow accepted professional standards in recording any find and should submit the standard Department of Parks and Recreation (DPR) Primary Record forms (Form DPR 523) and locational information to the appropriate CHRIS office (i.e. SSJVIC). If the PA determines that the find is insignificant, construction will proceed. If the PA determines that further information is needed to evaluate significance, the SHPO and other appropriate agencies will be notified, and the consultant will prepare a plan and a timetable for evaluating the find. Under CEQA, a find would be considered significant (would be classified as an "important archaeological resource") if it meets any of the following criteria:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Is associated with the lives of persons important in our past;

(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

To evaluate cultural resource sites against these CEQA criteria requires consideration of, among other things, the overall integrity of the site, the regional culture history (the types, ages, and distribution of other sites in the region), and the nature of questions that researchers are attempting to address regarding the history or prehistory of the region.

If human remains are found during construction of the KRCDPP, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the appropriate County Coroner. If the Coroner determines that the find is Native American, he/she must contact the NAHC. The NAHC, as required by the PRC (Section 5097.98) determines and notifies the Most Likely Descendant (MLD), and requests the MLD to inspect the burial and make recommendations for treatment or disposal. All pertinent California state laws will be followed if human remains are found during construction.

### 4. Mitigation Planning

If the PA and the consulting parties determine that the find is significant, they should prepare and carry out a mitigation plan in accordance with federal and state guidelines. This plan should emphasize the avoidance, if possible, of significant archaeological resources. If avoidance is not possible, the recovery of a sample of the deposit from which the archaeologist can define scientific data to address archaeological research questions should be considered an effective mitigation measure for damage to or destruction of the deposit.

The mitigation program, if necessary, should be carried out as soon as possible to avoid construction delays. Construction should resume at the site as soon as the field data collection phase of any data recovery effort is completed. The PA will verify the completion of field data collection by letter to appropriate agencies so that construction may resume.

### 5. Curation

The PA will arrange for the curation of archaeological materials collected during the monitoring and mitigation program at a qualified curation facility. A qualified curation facility is a recognized, archaeological repository with a permanent curator. The PA shall submit field notes, stratigraphic drawings, and other materials developed as part of the archaeological excavation program to the curation facility along with the collection.

### 6. Report of Findings

If buried archaeological deposits are found during construction, the PA will prepare a report summarizing the monitoring and archaeological investigation program implemented to evaluate the find or to recover data from an archaeological site as a

mitigation measure. This report should describe the site soils and stratigraphy, describe and analyze artifacts and other materials recovered, and explain the site's significance. This report should be submitted to the curation facility with the collection.

Following these mitigation measures would lower any potential KRCDPP effects on archaeological resources below the threshold of significance. Though it is possible that the KRCDPP could encounter significant archaeological deposits, the monitor would be present to detect, evaluate, and recover them. The monitoring and mitigation program would, therefore, be effective.

Emergency maintenance and repair could cause impacts to cultural resources. Specific mitigation measures will be developed to address impacts that cannot be avoided during construction. The potential for ongoing impacts to any resource that cannot be avoided through project redesign must be considered. Any mitigative data recovery should be properly scoped, in conjunction with the appropriate agencies, to address potential long-term ongoing impacts.

### 5.13.6 Cumulative Impacts

Since the proposed KRCDPP would not affect known significant archaeological resources, it would not be likely to cause significant cumulative impacts. If construction of the KRCDPP were to encounter a large, stratified, buried prehistoric archaeological site, the possibility of cumulative impacts would arise because such sites are highly significant, and many have been destroyed or damaged by agricultural activity and/or commercial, industrial, or residential development in the area. Given the relative low level of impact to such a site that the proposed KRCDPP and its associated linear facilities would cause, it is also unlikely that proposed activities would lead to significant cumulative impacts. Any potential impact to an unknown site would be minimized by monitoring during construction and by stop-work procedures if a site were uncovered.

### 5.13.7 References

Baumhoff, Martin A., 1963. Ecological Determinants of Aboriginal California Populations. University of California Publications in American Archaeology and Ethnology 49(2):155-236 Berkeley.

Beardsley, R.K., 1948. Cultural Sequences in Central California Archaeology. American Antiquity. 14(1):1-29.

Beardsley, R.K., 1954. Temporal and Areal Relationships in Central California Archaeology. University of California Archaeological Survey Reports 24 and 25, Berkeley.

Beck, W.A. and D.A. Williams, 1972. *California: A History of the Golden State*. Doubleday, Garden City, New York.

Beck, W.A., and Y.D. Haase, 1974. *Historical Atlas of California*. University of Oklahoma Press, Norman.

Bennyhoff, James A., 1994. Central California Augustine: Implications for Northern California Archaeology. In R.E. Hughes (ed.), Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson. Contributions of the University of California Archaeological Research Facility No. 52, Berkeley.

Billat, Lorna, n/d. Nextel Communications Wireless Telecommunication Service Facility – Fresno County. Letter Report. SSJVIC Report No. FR-1715 on file, California Historical Resources Information System, California State University, Bakersfield.

Bissonnette, Linda D., 1992. Cultural Resources Assessment: Fresno Material Recovery Transfer Facility North and Maple Avenues, Fresno County. SSJVIC Report No. FR-286 on file, California Historical Resources Information System, California State University, Bakersfield.

California (State of), Department of Parks and Recreation, Office of Historic Preservation. 1976. California Inventory of Historic Resources. State of California, The Resources Agency, Department of Parks and Recreation, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation. 1990. California Historical Landmarks. Office of Historic Preservation, Department of Parks and Recreation, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation. 1992a. California Points of Historical Interest. May 1, 1992. Office of Historic Preservation, Department of Parks and Recreation, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation, 1997. Title 14 Chapter 11.5. Regulations for California Register of

Historical Resources. Effective January 1, 1998. Office of Historic Preservation, Department of Parks and Recreation, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation, 1998. Historic Properties Directory. Office of Historic Preservation, Department of Parks and Recreation, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation (OHP), 2002. Directory of Properties in the Historic Property Data File for San Joaquin County. Office of Historic Preservation, Department of Parks and Recreation.

California (State of), Governor's Office of Planning and Research, 1994a. CEQA and Archaeological Resources. CEQA Technical Advice Series, Governor's Office of Planning and Research, Sacramento, California.

California (State of), Governor's Office of Planning and Research. 1994b. CEQA and Historical Resources. CEQA Technical Advice Series, Governor's Office of Planning and Research, Sacramento, California.

California (State of), Department of Transportation (Caltrans), 1989. Caltrans State and Local Bridge Survey. State of California Department of Transportation, Sacramento.

California, Energy Commission, 1992. Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification. California Energy Commission, Energy Facilities Siting and Environmental Protection Division, Sacramento.

California, Energy Commission, 1997. Rules of Practice and Procedure & Power Plant Site Certification. California Energy Commission, Sacramento.

California's Climate. Journal of California Anthropology :127-140.

Chartkoff, J.L. and K.K. Chartkoff, 1984. *The Archaeology of California*. Stanford University Press, Stanford, California.

Cook, S.F., 1955. The Aboriginal Population of the San Joaquin Valley, California. University of California Anthropological Records 16(2), Berkeley.

Elsasser, A.B., 1978. Development of Regional Prehistoric Cultures. In California, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 37-57. Smithsonian Institution, Washington, D.C.

Emanuels, George, 1992. *California Indians An Illustrated Guide.* Walnut Creek, California.

Fredrickson, D.A., 1973. Contributions of the University of California Archaeological Research Facility No. 52, Berkeley. 1973. Early Cultures of the North Coast Ranges, California. Ph.D. Dissertation, University of California, Davis.

Fredrickson, D.A., 1994. Archaeological Taxonomy in Central California Reconsidered. In R.E. Hughes (ed.), Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson.

Fresno, City of, 1984. General Plan. City of Fresno Development Department. Dumont Printing, Fresno.

Fresno, City of, 2002. 2025 Fresno General Plan and related Draft Environmental Impact Report No. 10130. Planning and Development Department Advance Planning, February 1, 2002.

Fresno, County of, 2000. Fresno County General Plan and EIR, Open Space and Conservation Element. Department of Planning, Fresno.

Gayton, Anna H., 1948. Yokuts and Western Mono-Ethnography. University of California Anthropological Records 10(1-2):1-302. Berkeley.

Gorsen, M.F.,1999.The New and Improved CEQA Guidelines Revisions: Important Guidance for Controversial Issues. Environmental Monitor, Winter 1999. Association of Environmental Professionals, Sacramento.

Gudde, E.G., 1974. *California Place Names: The Origin and Etymology of Current Geographical Names* (Third edition revised and enlarged, Second printing). University of California Press, Berkeley.

Hatoff, et al., 1995. Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project. SSJVIC Report No. FR-1715 on file, California Historicl Resources Information System, California State University, Bakersfield

Heizer, R.F., 1954. The Archaeology of Central California I: The Early Horizon. University of California Anthropological Records 12(1):1-84.

Hughes, R.E. (ed.), 1994. Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson. Contributions of the University of California Archaeological Research Facility No. 52, Berkeley.

Kroeber, A.L., 1925. California Book Company, Berkeley. Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Government Printing Office, Washington, D.C.

Kroeber, A.L., 1970. *Handbook of the Indians of California.* Third Edition.

Kyle, D.E. 1990. *Historic Spots in California* (Fourth edition of M.B. Hoover, H.E. Rensch and E.G. Rensch). Stanford University Press, Stanford.

Lillard, J.B., and W.K. Purves, 1936. The Archaeology of the Deer Creek – Cosumnes Area, Sacramento County, California. Sacramento Junior College, Department of Anthropology Bulletin 1. Sacramento.

Lillard, J.B., R.F. Heizer and F. Fenenga, 1939. An Introduction to the Archaeology of Central California. Sacramento Junior College, Department of Anthropology, Bulletin 2. Sacramento.

Love, Bruce and Tom Tang, 2001. Historical Resources Compliance Report The Burlington Northern Santa Fe Railway Company San Joaquin Corridor Capacity Improvements Bowles (MP 986.34) to Calwa (MP 994.80) Fresno County, California. Caltrans District 6. SSJVIC Report No. FR-1699 on file, California Historical Resources Information System, California State University, Bakersfield.

Moratto, M.J., 1984. California Archaeology. Academic Press, New York.

Moratto, et al., 1988. Preliminary Assessment of Cultural Resources along the Proposed Route of the PGT – PG&E Pipeline Project, Idaho, Washington, Oregon and California. Report on file, Pacific Gas & Electric Company, San Francisco.

Moratto, M.J. and T.F. King, and W.B. Woolfende, 1978. Archaeology and California's Climate. Journal of California Anthropology :127-140. National Park Service (NPS).

Moratto, M.J. and T.F. King, and W.B. Woolfende, 1983. Archaeology and Historic Preservation. Secretary of the Interior's Standards and Guidelines. Department of the Interior, Washington, D.C.

Nelson, W.J 2000. Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project, Segment WS04: Sacramento to Bakersfield. SSJVIC Report No. FR-1651 on file, California Historical Resources Information System, California State University, Bakersfield.

Pilas-Treadway, D. 2003. Proposed 18-Acre Electrical Peaker Faility Project on North Avenue, Community of Malaga, Fresno County, California. Letter from the Native American Heritage Commission dated December 26, 2002 to William Self Associates, Inc. Native American Heritage Commission, Sacramento.

Ragir, S.R., 1972. The Early Horizon in Central California Prehistory. Contributions of the University of California Archaeological Research Facility 15. Berkeley.

Sutton, Mark Q.,1989. EIR An Archaeological Survey of the Lemoore Oil Pipeline Route, Fresno and Kings Counties, California. SJVIC Report No. FR-227 on file, California Historical Resources Information System, California State University, Bakersfield.

Thompson and West, 1879. History of San Joaquin County, California with Illustrations. Howell-North Books, Berkeley, California (1968).

United States Department of Interior, Geological Survey (USGS), 1994. Malaga, California (1964 Photorevised 1981) USGS Topographic Quadrangle Map (scale 1:24,000) on file, United States Geological Survey, Menlo Park.

United States Department of the Interior, National Register of Historic Places, National Park Service, 2001. National Register of Historic Places Index by Property Location. Properties in California, listed determined, and pending.

Wallace, W.J., 1978. Southern Valley Yokuts. In, R.F. Heizer (ed.), Handbook of North American Indians, Volume 8, California, pp. 448-461. Smithsonian Institution, Washington, D.C.

# SECTION 5.14 PALEONTOLOGICAL RESOURCES

## 5.14.1 Introduction

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are important scientific and educational resources because they are used to:

- Study the phylogenetic relationships between extinct organisms, as well as their relationships to modern groups;
- Elucidate the taphonomic, behavioral, temporal and diagenetic pathways responsible for fossil preservation;
- Reconstruct ancient environments, climate change, and paleoecological relationships;
- Provide a measure of relative geologic dating which forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- Study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- Study patterns and processes of evolution, extinction and speciation; and
- Identify past and potential future human-caused effects to global environments and climates.

This section evaluates the potential for adverse impacts to significant non-renewable paleontological resources that may result from construction of the proposed King River Conservation District Peaking Plant (KRCDPP). Section 15.14.2 describes the affected environment of the proposed KRCDPP, including the geological setting and results of the field survey and records search. Section 15.14.3 lists the federal, state, and local laws, ordinances, regulations and standards (LORS), the accepted professional standards for the protection of paleontological resources, and the required permits and agency contacts. Section 5.14.4 describes the potential impacts to paleontological resources that may result from construction of the proposed KRCDPP. Proposed mitigation measures are

discussed in Section 5.14.5, and cumulative impacts are discussed in Section 5.14.6. Section 5.14.7 lists the applicable references.

## 5.14.2 Affected Environment

### *5.14.2.1 Geological Setting*

Kings River Conservation District (KRCD) will develop, construct, own and operate the KRCDPP. KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno near the Community of Malaga, in Fresno County. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19-acre property (Universal Transcerse Meractor (UTM) 11S, 255172 mE, 4063759 mN) and is located within the northeast one-quarter of Section 25, Township 14 South, Range 20 East, on the United States Geological Survey 7.5 minute Malaga Quadrangle map. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and right-of-ways for the gas, alternative water, alternative sewer, and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt (kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue.

Water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along

Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the Malaga Substation located on the northeast intersection of North and Willow Avenues.

Aspects of the regional and local geology that pertain to paleontological resources include the distribution, ages, and types of sediments, which occur within the KRCDPP site, and the known paleontological sensitivity of these units. This sensitivity forms the basis for the determination of the potential for adverse impacts to paleontological resources during construction.

The geology in the vicinity of the proposed project site has been mapped or described by Huntington (1965), Matthews and Burnett (1965) and Page and Le Blanc (1969), but no 1:24,000 scale geologic maps are currently available for the area. The information contained within these publications forms the basis for the following discussion on the regional geology. The site-specific geology of the KRCDPP is discussed below in Section 5.14.2.2.

The KRCDPP site is located along the eastern edge of the San Joaquin Valley, near the westernmost foothills of the Sierra Nevada. The Fresno area lies within the geomorphic

province known as the "Great Valley of California" (Jenkins, 1938), which is dominated by alluvial plains and low relief alluvial fans. In general, alluvial fans are mountain-front "aprons" of sediment, which are narrower at their heads and their toes, and with a decreasing gradient from head to toe. The eastern margin of the San Joaquin Valley is a nearly continuous series of coalescing alluvial fans, with their apices located where streams drain the west slope of the Sierra Nevada. These undeformed to slightly deformed deposits stretch from the dissected uplands of the Sierra Nevada mountains to the bottom of the San Joaquin Valley, and are composed of alluvial sediments deposited during the Pliocene, Pleistocene and Holocene eras.

Seven alluvial fans, 3 flood plains, 1 interfan area, and 1 sand dune area exist in the Fresno vicinity and were described and mapped by Page and Le Blanc (1969). These features were mapped more generally and at a larger scale by Matthews and Burnett (1965). Two of the Fresno area alluvial fans were deposited by intermittent streams, and are characterized by steeper and more dissected slopes than those of perennial streams. The other five alluvial fans were deposited by perennial streams, primarily the Kings and San Joaquin rivers. These fans are characterized by lower gradients, associated sand dunes, relict stream channels, and stream terraces (Page and Le Blanc, 1969).

Two large perennial streams flow through the Fresno area. The San Joaquin River consists of a meandering channel with a floodplain varying from 1 mile wide to 1/16 of a mile wide. The Kings River flows generally southwestward, and splits into two channels south of Riverdale. Downstream from the foothills, the Kings River floodplain ranges from more than 3 miles wide to 1/8 of a mile wide (Janda and Croft, 1965; Page and Le Blanc, 1969).

The low fans of the San Joaquin and Kings rivers have been subject to inundation historically, but are now controlled by levees. The largest geomorphic features in the Fresno area are the two high fans deposited by the San Joaquin and Kings rivers. These fans, which occur from 10 feet to 90 feet above the level of present day stream drainages, are not subject to flooding. The high fans of the San Joaquin and Kings rivers exhibit many of the same features. Both are deeply dissected, and ancient stream channels have deposited channel remnants across them. South of Fresno near Fowler, and extending westward to Burrel, sand dunes with a thickness of 5 to 20 feet have been deposited to the southwest of the fan deposits on the valley floor (Page and Le Blanc, 1969).

Alluvial fan deposits along the eastern flank of the San Joaquin Valley consist of medium to fine-grained sediments derived from Tertiary and older sedimentary, volcanic, plutonic, and metamorphic rocks in the Sierra Nevada (Clark, 1964). Grain sizes

decrease westward into the valley and away from stream channels, from coarse pebble to cobble gravel at the Sierra Nevada foothills to silt and clay on the San Joaquin and Kings river floodplains. The gravel, sand and silt that comprises alluvial fans and basin alluvial plains in the Great Valley are known to contain locally abundant and scientifically significant vertebrate, invertebrate and plant fossils of Plio-Pleistocene age. Mammal fossils are perhaps the most well known of these, and include mammoth, mastodon, horse, bison, camel, ground sloth, antelope, and many other smaller taxa.

According to Page and Le Blanc (1969), two surficial geologic units underlie the vicinity of the proposed KRCDPP. These include "Older alluvium" and "Sand dunes." The Older alluvium is reported to be Pleistocene and early Holocene in age, and the Sand dunes deposits are reported to be Holocene in age.

#### *5.14.2.2 Field Survey and Results*

A paleontological resources study was conducted by Dr. Paul C. Murphey, Principle Investigator of Paleontology at SWCA Environmental Consultants, Inc. This survey met all California Energy Commission (CEC) requirements (CEC, 2000), regulations, and the standard measures for mitigating adverse construction-related impacts to significant paleontological resources established by the Society of Vertebrate Paleontology(SVP) (SVP, 1995). The resume for Mr. Murphey is included as Appendix 5.14-1.

Prior to the field survey, published and available unpublished geological and paleontological literature (including geologic maps) was reviewed and evaluated, and museum locality and specimen database searches were conducted in order to 1) determine whether any previously documented significant fossil localities occur within the KRCDPP site; 2) assess the potential for disturbance of these localities during construction; and 3) evaluate the paleontologic potential of the rock formations and/or surficial deposits underlying the KRCDPP site. The museums included in the records search included the University of California Museum of Paleontology (UCMP), and the Natural History Museum of Los Angeles County (LACM). The aerial distribution of the geologic units within and surrounding the project site was assessed using published geologic maps and checked in the field.

The purpose of the literature and records search was to develop a baseline paleontological resource inventory for the geologic units present within the project site, the surrounding area, and similar types of deposits elsewhere in the Great Valley and within California. Together with an evaluation of the significance of the fossils inventoried and sites where they were found, these data were used to assess the paleontological sensitivity of the geologic units present within the area of the KRCDPP. These methods are consistent with

CEC (2000) and SVP (1995) guidelines for assessing the importance of paleontological resources in areas of potential environmental effect.

The field survey for the study was conducted on September 17, 2003. This survey consisted of a 100% pedestrian inspection of the KRCDPP site and affected areas defined in section 5.14.2.1 for 1) surface fossils, 2) exposures of potentially fossiliferous rocks or surficial sediments, and 3) areas in which fossiliferous rocks or potentially fossiliferous surficial deposits could be exposed or otherwise impacted during the proposed construction. Although no subsurface exploration was conducted for this study, the subsurface was visible to a depth of approximately 15 feet on the east side of the existing storm water basin located adjacent to the KRCDPP project site to the north, and to a depth of approximately 5 feet along the western boundary of the site in an existing open trench. Figure 5.14-1 shows the survey area and survey results.

As mapped on the geologic map of the Fresno sheet (Matthews and Burnett, 1965; scale 1:250,000), the KRCDPP site is underlain by Quaternary (Pleistocene or Holocene) fan deposits composed of granitic sand and silt. Page and Le Blanc's (1969) map is at a smaller and thus more useable scale, and provides greater resolution and detail. According to these workers, the KRCDPP site is underlain by older alluvium (Pleistocene or Holocene), which was deposited on the high alluvial fan of the Kings River. Quaternary sand dunes are mapped immediately to the south of the KRCDPP site, and are reported by Page and Le Blanc (1969) to be Holocene in age. As was confirmed by the field survey for this study, the surface of the KRCDPP site is previously disturbed, and sand dune deposits are not present. Therefore, they will not be discussed further.

The older alluvium underlying the KRCDPP site was visible in an approximately 15 foot thick exposure on the east side of the existing storm water basin located adjacent to the project site to the north, and in an approximately 5 foot deep trench along its western boundary. The exposed profile consists of grayish orange (10YR 7/4) to grayish orange pink (5YR 7/2) weakly bedded non-calcareous moderately well sorted silty sand of granitic origin (quartz dominated, biotite, feldspar; subangular to rounded, 1.5-2.0 ø). Scattered small rhizoliths, as well as two larger root casts, were observed, but no other fossils were visible. The sand is poorly consolidated, and is overlain by thin (0.1-0.3 thick) cover of loess and sandy soil, which in places on the surface of the KRCDPP project site appears to consist of imported fill and may locally be thicker. No other exposures of subsurface sediments were visible anywhere within the KRCDPP site, or other areas of affect as defined in Section 5.14.2.1.

No fossils were found within the KRCDPP site. No previously recorded fossil localities from within the project boundaries were found in the scientific literature or are recorded in the paleontological databases of the UCMP or LACM. Scientifically significant vertebrate fossils have, however, been documented in Plio-Pleistocene and early Holocene alluvial deposits elsewhere within the Great Valley and the State of California (Graham and Lundelius, 1994a, 1994b; Hay, 1927; Lundelius et al., 1983; Merriam, 1917; Savage, 1951; Stirton, 1939, 1951; and many other publications and unpublished paleontological reports). These include remains of a diversity of taxa, including mastodon, mammoth, horse, camel, ground sloth, camel, horse, deer, dire wolf, coyote, rabbit, rodents, birds, fish, turtles, snakes, and frogs. Also preserved are invertebrates including bivalves and gastropods, and plant fossils including wood, leaves and seeds.

In conclusion, although no fossil occurrences have been reported from within the KRCDPP site, numerous published and unpublished reports of scientifically significant fossil vertebrates from alluvium exist from around the Great Valley, elsewhere within the State of California, and across North America. These occurrences indicate the potential for scientifically significant fossils to be present within the older alluvium underlying the KRCDPP site, and consequently, the possibility that these resources could be adversely impacted during construction. Following SVP (1995) criteria, older (Pleistocene and early Holocene) alluvium has high paleontologic potential, and thus is considered to have high paleontological sensitivity. At the KRCDPP site, the uppermost few feet of sediments are unlikely to contain significant vertebrate fossil remains. Deeper excavations that extend into underlying older alluvium may well encounter vertebrate fossils.

Identifiable fossil remains salvaged during paleontologic monitoring and mitigation for the proposed KRCDPP could represent new taxa and/or temporal range extensions or new biogeographic occurrences. Such fossils may also provide new data on the age of the sediments in which they were preserved, and the depositional, environmental, and climatic history of this part of the San Joaquin Valley.

### 5.14.3 Laws, Ordinances, Regulations, and Standards

Fossils are classified as non-renewable scientific resources and are protected by federal, state and local LORS, statutes, guidelines and recommendations. These include the Federal Antiquities Act of 1906; the Historic Sites Act of 1935 (Public Law (P.L.) 74-292; 49 Stat. 666, 16 United States Code (USC) 461 et seq.), the National Environmental Policy Act of 1969 (NEPA)(PL 91-190; 31 Stat. 852, 42 USC. 4321-4327), the Federal Land Policy and Management Act of 1976 (PL 94-579; 90 Stat. 2743, USC 1701-1782). State of California legislation includes the California Environmental Quality Act (CEQA,

1970; 13 PRO, 2100 et seq.) and Public Resources Code (PRC) Section 5097.5 (State 1965, c. 1136, p. 2792, Archaeological, Paleontological, and Historical Sites), and Section 30244 (Reasonable mitigation of adverse impacts on state lands). Professional standards for the assessment and mitigation of adverse impacts to paleontological resources have also been established by the SVP (1995).

Design, construction, and operation of the proposed KRCDPP and associated facilities will be conducted in accordance with the LORS, which are applicable to paleontological resources. Federal, state, and local LORS, including the professional standards of the discipline of vertebrate paleontology, are summarized and discussed below:

### *5.14.3.1 Federal*

Federal legislative protection for paleontological resources derives from the Antiquities Act of 1906 (PL 59-209; 16 USC 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federally administered lands. Federal protection for scientifically significant paleontological resources would apply to the proposed KRCDPP if any construction or other related project impacts occurred on federally owned or managed lands, involved the crossing of state lines, or were federally funded. No federal protection of paleontologic resources pertains to the proposed KRCDPP.

### *5.14.3.2 State*

With regard to paleontological resources, the CEC environmental review process under the Warren-Alquist Act is considered functionally equivalent to that of the California Environmental Quality Act (CEQA). Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 14, Chapter 3, California Code of Regulations: 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA, and include as one of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section XIV, Part a) the following question: "*Would the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*"

Other state protections and requirements for paleontological resources are included in the PRC (Chapter 1.7), Sections 5097.5 and 30244. These statues prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands. These protections would apply only if the state or a

state agency were to obtain ownership of project lands during the term of the project license.

#### *5.14.3.3 County*

Fresno County does not have mitigation requirements that specifically address potential adverse impacts to paleontological resources.

#### *5.14.3.4 City*

The City of Fresno does not require pre-construction paleontological resource assessments or surveys. If fossils are discovered during any construction project within the city, however, a qualified paleontologist must be consulted to inspect the find and recommend mitigation measures. These recommendations must then be implemented to mitigate impacts to the affected paleontological resource. The University of California Museum of Paleontology (UCMP) in Berkeley is designated as the institution to contact in order to consult with qualified paleontologists if fossils are found during construction within city limits.

The jurisdictional boundary between the City of Fresno and the County of Fresno is located north of the proposed KRCDPP.

#### *5.14.3.5 Professional Standards*

The SVP has established standard guidelines (SVP, 1995, 1996) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists in the nation adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most California state regulatory agencies accept and utilize the professional standards set forth by the SVP.

As defined by the SVP (1995, p. 26), significant nonrenewable paleontologic resources are defined as:

*"fossils and fossiliferous deposits here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments."*

As defined by the SVP (1995, p. 26), significant fossiliferous deposits are defined as:

*"a rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years, BP."*

Under CEQA guidelines, (PRC 15064.5 (a) (2)), public (state) agencies must treat all historical and cultural resources as significant unless the preponderance of evidence demonstrates that they are not historically or culturally significant. In keeping with significance definitions of the SVP (1995), all vertebrate fossils are considered to have significant scientific value. This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found have high sensitivity.

A geologic unit known to contain significant fossils is considered to be "sensitive" to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from that for archaeological resources as follows:

*"It is extremely important to distinguish between archaeological and paleontological (=fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontologic sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontologic potential in each case"* (SVP, 1995).

Many archaeological sites contain features that are visually detectable on the surface. In contrast, fossils are contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity. In summary,

paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside of the study area), a similar geologic unit, or based on whether the unit in question was deposited in a type of environment which is known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken in order to prevent adverse impacts to these resources.

In its "standard guidelines for the assessment and mitigation of adverse impacts to non-renewable paleontologic resources," the SVP (1995, p. 23) defines three categories of paleontologic sensitivity (potential) for rock units: high, low, and undetermined:

*"High Potential. Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant non-renewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations, which contain significant non-renewable paleontologic resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas which contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas which may contain new vertebrate deposits, traces, or trackways are also classified as significant.*

*Low Potential. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.*

*Undetermined Potential. Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials."*

For geologic units with high potential, full-time monitoring is generally recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts will not generally be required. For geologic units with undetermined potential, field surveys by a qualified vertebrate paleontologist should be conducted to specifically determine the paleontologic potential of the rock units present within the study area.

### 5.14.4 Environmental Consequences

Potential adverse impacts to paleontological resources resulting from construction, operation and maintenance of the proposed KRCDPP include construction-related impacts and operation-related impacts. Construction-related impacts would result primarily from large construction excavations, but also from other ground disturbing activities, including brushing, grading, trenching or boring for pipelines or powerlines, augering for piles, poles, or electrical towers, and any other earth moving activities. These activities have the potential to disturb an unknown quantity of fossils, which may occur underneath the surface of the KRCDPP. Without mitigation, these fossils, as well as the paleontological data they could provide if properly salvaged and documented, could be adversely affected, and are thus considered to be sensitive to ground disturbance.

#### *5.14.4.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant impact to paleontological resources. This section discusses the potential for significant impacts associated with construction or O&M of the proposed KRCDPP in relation to the checklist questions in Table 5.14-1, below.

**5.14-1**
**CEQA Environmental Checklist - Paleontological Resources**
**KRCDPP**

| Paleontological Resources – Would the Project: | Potentially Significant Impact | Less Than Significant with Mitigation | Less than Significant | No Impact |
|---|---|---|---|---|
| a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | | X | | |

#### *5.14.4.2 Impact Assessment*

The substrate of the KRCDPP site consists of older alluvium of the high alluvial fan of the Kings River, which is Pleistocene and early Holocene in age (Page and le Blanc, 1969), and which is considered to have high paleontological sensitivity because older alluvial deposits in the Great Valley of California and elsewhere are known to contain scientifically significant vertebrate fossils.

The surface of the KRCDPP site was subjected to a 100% pedestrian survey, and was found to be previously disturbed by human activities and devoid of paleontological resources. Therefore, activities affecting only the surface are not expected to result in adverse impacts to paleontological resources. Direct impacts to potentially significant paleontological resources are expected to be construction-related, and during excavation activities at the site. If subsurface fossils are present at the project site, it is likely that they could be disturbed or possibly destroyed by construction excavations. Indirect adverse impacts to paleontological resources are those, which could occur from the operation of the plant or ancillary facilities. No adverse indirect impacts to paleontological resources are expected to result from the continuing operation of the KRCDPP or any of its facilities.

### 5.14.5 Proposed Mitigation Measures

This section presents the proposed mitigation measures that will be implemented in order to reduce potential adverse impacts to significant paleontological resources resulting from construction of the KRCDPP. This mitigation program is designed to reduce, to an insignificant level, the direct, indirect, and cumulative adverse impacts to paleontological resources that could result from project construction. The mitigation measures proposed herein are consistent with CEC environmental guidelines (CEC, 2000), and with SVP standard guidelines for the mitigation of adverse construction-related impacts (SVP 1995).

Prior to construction, a qualified paleontologist will be retained to both design a paleontological resources monitoring and mitigation program (PRMMP) to CEC standards and specifications, and implement the program during project-related deep excavations and deep boring activities (not anticipated for this project) at the KRCDPP site. The PRMMP will include construction monitoring procedures; techniques for recovery and salvage; a sampling strategy for potentially fossiliferous matrix; unanticipated discovery procedures; data recovery standards and protocols, qualifications of personnel; procedures for specimen preparation and transfer to an approved paleontological repository, preconstruction planning and coordination; and the schedule and content of interim and final reports.

Because the surface of this project site has been previously disturbed by human activity and surveyed by a qualified paleontologist (this study), no additional pre-construction surface survey is necessary. For previously undisturbed sediments underlying the project site, all deep excavations and deep boring activities (not anticipated for this project) will be monitored by qualified and approved paleontological resource monitors. Monitoring will not be necessary in areas where exposed sediments will be buried, but not otherwise impacted. Monitors will examine excavated sediments and deep excavation sidewalls for evidence of significant fossil resources. All monitors will be experienced in paleontologic salvage, and equipped with the necessary tools for the rapid removal of fossils and retrieval of associated data in order to prevent construction delays.

Prior to the commencement of construction, all construction personnel involved with site excavation activities will be informed, by a qualified paleontologist, about the possibility of finding significant fossils during construction, trained on what these fossils look like, and instructed on the procedures to follow in the event of a discovery.

Implementation of these mitigation measures will reduce the potential for adverse direct or indirect impacts to unique paleontological resources or sites to an insignificant level by properly and efficiently salvaging and documenting them in the field. This will be followed by preparation and curation of recovered fossils, so that they and their associated data will be available for study and preserved into perpetuity in a publicly supported paleontological repository that meets SVP standards.

### 5.14.6 Cumulative Impacts

Even if significant paleontological resources are discovered during construction of the KRCDPP, the potential for a cumulative impact is low, as long as mitigation measures are undertaken to salvage the resources. The proposed mitigation measures detailed in Section 5.14.5 would effectively recover the value to science of all significant fossils recovered. Indeed, because the fossils may never have been available for study without the mitigation measures, the cumulative impacts may actually be beneficial as recovered specimens could help paleontologists address important questions regarding the age of the sediments, types of animals which lived there during the Pleistocene Epoch, and the environment and climate in which they lived.

### 5.14.7 References

California Energy Commission, 2000. Paleontological resources: *in* Regulations pertaining to the rules of practice and procedure & generating facility site certification, 3 p.

California State Historic Preservation Office, 1983. Summary of state/federal laws protecting cultural resources: California State Historic Preservation Office, Sacramento, CA, 4 p.

Clark, L. D., 1964. Stratigraphy and structure of part of the western Sierra Nevada metamorphic belt, California: U. S. Geological Survey Professional Paper 410, 70 p.

Graham, R.W., and Lundelius, E.L., 1994a. Faunmap: A Database documenting late Quaternary distributions of mammal species in the United States: Illinois State Museum Scientific Papers, Vol. XXV, no. 1, 287 p.

Graham, R.W., and Lundelius, E.L., 1994b. Faunmap: A Database documenting late Quaternary distributions of mammal species in the United States: Illinois State Museum Scientific Papers, Vol. XXV, no. 2, 690 p.

Hay, O. P., 1927. The Pleistocene of the western region of North America and its vertebrate animals: Carnegie Institute of Washington Publication 322B, 346 p.

Janda, R. J., and Croft, M. G., 1965. The stratigraphic significance of a sequence of noncalcic brown soils formed on the Quaternary alluvium of the northeastern San Joaquin Valley, California: International Association for Quaternary Research Proceedings, vol. 9, p. 158-190.

Jenkins, O. P., 1938. Geologic map of California: California Division of Mines and Geology, Sacramento, CA, (1:500,000 scale).

Lundelius, E. L., Jr., Graham, R. W., Anderson, E., Guilday, J., Holman, J. A., Steadman, D. W., and Webb, S. D., 1983. Terrestrial vertebrate faunas: p. 311-353, *in*: Porter, S. C. (editor), Late Quaternary environments of the United States, volume 1, the Late Pleistocene, University of Minnesota Press, Minneapolis, MN, 407 p.

Matthews, R.A., and Burnett, J.L., 1965. Geologic map of California (Olaf P. Jenkins Edition), Fresno sheet: State of California Department of Conservation Map, scale 1:250,000 (1 sheet).

Merriam, J. C., 1917, Relationships of Pliocene mammalian faunas from the Pacific Coast and Great Basin Provinces of North America: University of California Publications, Bulletin of the Department of Geology, vol. 10, no. 22, p. 421-443.

Page, R.W., and Le Blanc, R.A., 1969. Geology, hydrology and water quality of the Fresno area, California: U.S. Geological Survey Water Resources Division, Open File Report 6417-03.

Savage, D. E., 1951. Late Cenozoic vertebrates of the San Francisco Bay region: University of California Publications, Bulletin of the Department of Geological Sciences, vol. 28, no. 10, p. 215-314.

Society of Vertebrate Paleontology, 1995. Assessment and mitigation of adverse impacts to nonrenewable paleontologic resources – standard guidelines: Society of Vertebrate Paleontology News Bulletin, vol. 163, p. 22-27.

Society of Vertebrate Paleontology, 1996. Conditions of receivership for paleontologic salvage collections: Society of Vertebrate Paleontology News Bulletin, vol. 166, p. 31-32.

Stirton, R. A., 1939. Cenozoic mammal remains from the San Francisco Bay region: University of California Bulletin of the Department of Geological Sciences, vol. 24, no. 13, p. 339-410.

Stirton, R. A., 1951. Prehistoric land animals of the San Francisco Bay region: California Division of Mines Bulletin 154, p. 177-186.

# SECTION 5.15 BIOLOGICAL RESOURCES

## 5.15.1 Introduction

Kings River Conservation District (KRCD) is proposing to construct, own and operate the proposed KRCD Peaking Plant (KRCDPP) to be located in Fresno County, California. The objectives of this section are to describe the biological resources that occur in the general area of the KRCDPP, including threatened and endangered species and their habitats, and to describe the potential impacts that could occur to those species as a result of the proposed KRCDPP. The section includes a description of the federal, state and local laws, ordinances, regulations, and standards (LORS) that apply to biological resources protection, the setting and conditions of the area, the methods that were used to evaluate the potential presence of threatened and endangered species, and the potential adverse impacts that could occur to biological resources as a result of the proposed KRCDPP.

## 5.15.2 Affected Environment

### *5.15.2.1 Regional Setting*

The proposed KRCDPP is located in the southern San Joaquin Valley, south of the City of Fresno and near the industrial Community of Malaga, in Fresno County, California. The region's climate is Mediterranean, characterized by hot, dry summers and cool wet winters. Summer temperatures frequently exceed 100 degrees Fahrenheit, while winter temperatures are generally mild, with few freezing days per year. Rainfall averages 12 inches per year, with the wettest months between November and March.

### *5.15.2.2 Project Area Setting*

The following discussion describes the biological conditions in the area of the proposed KRCDPP and including the project site and associated linear facilities. Biological conditions described include vegetation and habitat types, local wildlife and plant species, and special-status species that occur in the general project area.

The KRCD currently has an option to purchase approximately 19 acres of land near the Community of Malaga. The KRCDPP project site would consist of the southern 9.5 acres of the larger 19-acre property. The northern 9.5 acres would be used for temporary staging and parking during construction. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. Linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. An access road and

right-of-ways for the gas, alternative water, alternative sewer and electric transmission interconnections would cross the 9.5 acres to the north of the proposed KRCDPP site. The proposed routes for these linear facilities are described later in this section.

### *5.15.2.3 General Vegetation and Habitats*

The 19-acre area is a disked fallow field within an industrially developed area. It possesses mainly non-native weedy grasses and forbes which have grown since the field's last disking. This vegetation is typical of fallow fields and vacant lots, which are disked annually to control weeds and fire hazards. Plants observed on the 18.2 acres include: Russian thistle (*Salsola iberica*), tumble pigweed (*Amaranthus alba*), puncturevine (*Tribulus terrestris*), yellow starthistle (*Centaurea solstitialis*), ripgut brome (*Bromus rigidus*), prickly lettuce (*Lactuca serriola*), common spikeweed (*Hemizonia pungens*), jimpsonweed (*Datura stramonium*), netseed lambsquarters (*Chenopodium berlandieri*), black mustard (*Brassica nigra*), tree tobacco (*Nicotiana glauca*), filaree (*Erodium* sp.), fiddleneck (*Amsinckia intermedia*), fox-tail barley (*Hordeum* sp.), common mallow or cheeseplant (*Malva neglecta*), milk thistle (*Silybum marianum*), festuca grass (*Festuca* sp.), common sunflower (*Helianthus annuus*), and telegraphplant (*Heterotheca grandiflora*). The 4-acre storm water basin located north of the KRCDPP project site has about 10 Fremont cottonwood (*Populus fremontii*) trees, several dead narrow-leaved willow (*Salix exigua*) and Gooddings black willow (*Salix gooddingii*) trees, and a few coyote brush (*Baccharis pilularis*) which have colonized the bottom of the basin. The area has not been leveled though it is fairly flat. Animals observed on the site are those typically found to live and forage in fallow fields. Such animals are locally and regionally common and abundant and include species such as Mourning Dove, Western Fence Lizard, Audubon Cottontail, Coyote, American Kestrel, Red-tailed Hawk, California Ground Squirrel, Pocket Gopher, and European Starling.

The 9.5 acre project site and 9.5 acre construction staging and parking area is not native land. It has been previously impacted by disking for weed control and excavation of the 4-acre storm water basin. No native habitat for special-status plants or animals exists. Also, no sensitive habitats (such as wetlands, vernal pools, streams, creeks) occur on the 19 acre site. Soils are sandy (as described further in Section, 5.6 Agriculture and Soils) and there is no evidence of vernal pool wetlands (depressions or swales, hydrology, or vegetation).

The area surrounding the proposed KRCDPP site includes mostly industrial properties, with 5 residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the Pacific Gas and Electric Company

(PG&E) Malaga Substation located on the northeast intersection of North and Willow Avenues. The industrial areas include developments such as cotton storage warehouses, a manufacturing plant for agricultural products (herbicides, tanks, spray equipment), grain silos, a cotton gin, scrap metal plants, storage sheds, equipments storage areas, and a disked vacant lot. These areas have been leveled, developed, and provide no habitat for special-status wildlife or plant species. To the south of the KRCDPP project site is a railroad track and an abandoned vineyard. The vineyard has been leveled and irrigated in the past, and does not provide habitat for special-status wildlife or plant species. The Central Canal, which is owned and operated by Fresno Irrigation District (FID), runs along the southeast border of the KRCDPP project site.

#### *5.15.2.4 Special-Status Plant Species*

Special-status plant species are species that have been afforded special recognition and protection by federal, state, or local resource conservation agencies and organizations. These species are generally considered rare, threatened, or endangered due to declining or limited populations. Special-status species include:

- Plants that are legally protected or proposed for protection under the California Endangered Species Act (CESA) or Federal Endangered Species Act (FESA);
- Plants defined as endangered or rare under the California Environmental Quality Act (CEQA) (Section 15380);
- Plants designated as species of special concern by the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Game (CDFG); and
- Plants listed in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California.

A variety of special-status plant species are reported from the general region of the proposed KRCDPP. These species include special-status plant species reported in the CDFG California Natural Diversity Data Base (CNDDB) search of the United States Geological Survey (USGS) 7.5 minute Malaga Quadrangle map, which includes the location of the KRCDPP. CNDDB searches of the eight surrounding USGS quadrangle maps (i.e. Fresno North, Clovis, Round Mountain, Fresno South, Sanger, Caruthers, Conejo, and Selma) were also completed. Copies of the CNDDB plant species search results are included as Appendices 5.15-1 and 5.15-2.

#### *5.15.2.5 Special-Status Wildlife Species*

Special-status wildlife species are species that have been afforded special recognition and protection by federal, state, or local resource conservation agencies and organizations.

These species are generally considered rare, threatened, or endangered due to declining or limited populations. Special-status species include:

- Animals that are legally protected or proposed for protection under the CESA or FESA;
- Animals defined as endangered or rare under the CEQA (Section 15380);
- Animals designated as species of special concern by the USFWS or CDFG; and
- Animals listed as "fully protected" in the Fish and Game Code of California (Sections 3511, 4700, 5050, and 5515).

A variety of special-status wildlife species are reported from the general region of the proposed KRCDPP. These species include special-status wildlife species reported in the CDFG CNDDB search of the USGS 7.5 minute Malaga Quadrangle map, which includes the location of the KRCDPP. CNDDB searches of the eight surrounding USGS quadrangle maps (i.e. Fresno North, Clovis, Round Mountain, Fresno South, Sanger, Caruthers, Conejo, and Selma) were also completed. Copies of the CNDDB wildlife species search results are also included as Appendices 5.15-1 and 5.15-2.

### 5.15.3 Laws, Ordinances, Regulations, and Standards

To ensure the long-term protection of the environment and natural resources, laws and regulations have been implemented through multiple environmental protection acts, which include:

- Section 404 of the Clean Water Act (33 United States Code (USC) 1251-1376);
- Section 10 of the Rivers and Harbors Act (33 USC 401 et seq.);
- Executive Order 11990, Protection of Wetlands (May 24, 1977);
- National Environmental Policy Act (NEPA) (42 USC 4321 et seq.);
- FESA (16 USC 1531-1543);
- Fish and Wildlife Coordination Act (16 USC. 661-666);
- CEQA (Public Resources Code (PRC 21000 et seq.);
- CESA (California Fish and Game Code 2050 et seq.);
- Native Plant Protection Act (California Fish and Game Code 1900-1913);
- Fish and Wildlife Protection and Conservation (California Fish and Game Code 1601-1603);
- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711);
- Bald and Golden Eagle Protection Act (16 USC 668).

Implementation and regulation of these acts has been delegated to several federal and state agencies. The following section briefly describes the LORS that are applicable to the proposed KRCDPP and which, if any, agency governs.

### *5.15.3.1 Federal*

**Wetlands and Other Waters of the United States**

Waters of the United States, including wetlands and creek channels are subject to federal and state agency regulations. The U.S. Army Corps of Engineers (Corps) has jurisdiction over waters of the United States under Section 404 of the Clean Water Act. Waters of the United States may include interstate lakes, rivers, streams, mudflats, natural ponds, tributaries to Waters of the United States, and adjacent wetlands. Wetlands under Corps' jurisdiction are determined using technical criteria for hydrology, soil, and vegetation described in the Corps Wetland Delineation Manual (1987). Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially-irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water filled depressions (Code of Federal Regulations (CFR) 33, Part 328).

Construction activities within jurisdictional waters are regulated by the Corps. Placement of fill into jurisdictional waters requires issuance of a permit by the Corps as well as state water quality certification pursuant to Section 401 of the Clean Water Act. The State Water Resources Control Board (SWRCB) is the state agency charged with implementing water quality certification in California.

**FESA**

The Federal Endangered Species Act of 1973 recognized that many species of fish, wildlife, and plants are in danger of or threatened with extinction and established a national policy that all federal agencies should work toward conservation of these species. The Secretary of the Interior and the Secretary of Commerce are designated in the FESA as responsible for identifying endangered and threatened species and their critical habitats, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7(c) of the FESA if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from, a federal agency as defined in Part 404.02. Section 10 allows for the "incidental take" of endangered and threatened species of wildlife by non-federal entities. Incidental take is defined by the FESA as take that is

"incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10(a)(2)(A) requires an applicant for an incidental take permit to submit a "conservation plan" that specifies, among other things, the impacts that are likely to result from the taking and the measures the permit applicant will undertake to minimize and mitigate such impacts. Section 10(a)(2)(B) provides statutory criteria that must be satisfied before an incidental take permit can be issued.

**Migratory Bird Treaty Act**

The Migratory Bird Treaty Act of 1918 (16 USC 703-711) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

**Bald and Golden Eagle Protection Act**

Specifically protects Bald and Golden Eagles from harm or trade.

### 5.15.3.2 State

**CESA**

CESA (Fish and Game Code Sections 2050-2098) established a state policy to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. The Fish and Game Commission is charged with establishing a list of endangered and threatened species. State agencies must consult with the CDFG to determine if a proposed project is likely to jeopardize the continued existence of any endangered or threatened species.

Section 2081 of the Fish and Game Code allows the "take" of a species listed as threatened or endangered by the CESA. Take is defined as any act that involves direct mortality or other actions that may result in adverse impacts when attempting to take individuals of a listed species. Under Section 2081, the CDFG may issue a permit to authorize take for scientific, educational or management purposes, or take that is incidental to otherwise lawful activities.

**California Fish and Game Code**

**Section 1900 - Native Plant Protection Policy**

The goals of the California Native Plant Protection Policy are to preserve, protect, and enhance endangered or rare plants of this state. A "native plant" means a plant that grows in a wild uncultivated state that is normally found native to the plant life of this state (Section 1901). The Fish and Game Commission may adopt regulations governing the taking, possession, propagation, transportation, exportation, importation, or sale of

any endangered or rare native plants. Such regulations may include, but shall not be limited to, requirements for persons who perform any of the foregoing activities to maintain written records and to obtain permits, (Section 1907).

**Section 3503**

It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 protects all birds-of-prey and their eggs and nests; and Section 3513 makes it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act.

**Other Special-Status Species Classifications**

Impacts on California species of special concern (CSC) and species included on CNPS lists shall be considered significant if one of the following would result: a) direct mortality; b) permanent loss of existing habitat; c) temporary loss of habitat that may result in increased mortality or lowered reproductive success; or d) avoidance of biologically important habitat for substantial periods that could increase mortality or cause lowered reproductive success (Section 15065, CEQA Guidelines and CDFG Code Sections 1900-1913).

**Title 14, California Code of Regulations, Sections 670.2 and 670.5**

Lists animals designated as threatened or endangered in California. CSC is a category designated by CDFG for species considered to be indicators of regional habitat changes, or candidate species for future state listing. CSC do not have special legal status, but are used by CDFG as a management tool when considering the future use of any land parcel.

**CDFG Streambed Alteration Agreement**

Any project-related activity with the potential to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the CDFG, or use material from the streambeds requires that prior notification be provided to the CDFG and may require issuance of a Streambed Alteration Agreement pursuant to Sections 1600-1607 of the Fish and Game Code.

**CEQA**

Requires that a project's effects on environmental resources must be analyzed and assessed using criteria determined by the lead agency. Defines a rare species in a broader sense than the definitions of threatened, endangered, or CSC. Under this definition, CDFG and request additional consideration of species not otherwise protected. The

California Energy Commission (CEC) is serving as the lead agency for CEQA compliance for the proposed KRCDPP.

#### *5.15.3.3 Local*

**Fresno County General Plan**

Fresno County contains important wetland, riverine, and wildlife habitats. These areas support many specialized plant and animal species. Policies in the Fresno County General Plan (2000) seek to protect natural areas and to preserve the diversity of habitat in the county. Open space and conservation elements of the plans contain policies that pertain to the preservation and protection of biological resources.

#### *5.15.3.4 Required Permits*

No negative or adverse impacts will occur to biological resources, including special-status species and habitats and thus no permits are required.

### 5.15.4 Environmental Consequences

#### *5.15.4.1 Environmental Checklist*

The following is an excerpt from the CEQA Initial Study Environmental Checklist and will be used by the CEC to assess the potential for significant impact to biological resources. This section discusses the potential for significant impacts associated with the proposed KRCDPP in relation to the checklist questions in Table 5.15-1, below.

**Table 5.15-1**
**CEQA Environmental Checklist –Biological Resources**
**KRCDPP**

| BIOLOGICAL RESOURCES – Would the project: | Potentially Significant Impact | Less Than Significant With Mitigation | Less Than Significant | No Impact |
|---|---|---|---|---|
| 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 CDFG or USFWS? | | | | X |
| 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 CDFG or USFWS? | | | | X |

| Table 5.15-1<br>CEQA Environmental Checklist –Biological Resources<br>KRCDPP | | | | |
|---|---|---|---|---|
| **BIOLOGICAL RESOURCES – Would the project:** | **Potentially Significant Impact** | **Less Than Significant With Mitigation** | **Less Than Significant** | **No Impact** |
| 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? | | | | X |
| 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? | | | | X |
| 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 |

### *5.15.4.2 Impact Assessment Methodology*

Information pertaining to threatened, endangered, or other special-status species that may occur in the KRCDPP project area was collected from several sources including:

- CNDDB,
- CNPS Database,
- Technical publications and books,
- Relevant Environmental Impact Reports (EIRs),
- Literature queries via the internet,
- USFWS, Threatened and Endangered Species System,
- USFWS, Species Lists for Quadrangle Maps,
- USFWS, Species List for Fresno County,
- Special Plants List (CDFG, 2003),
- Special Animals List (CDFG, 2003),
- Fresno County General Plan (Fresno County, 2000), and

- Sensitive Element Inventory (KRCD, 1992).

A search of the CNDDB (as described above) was conducted to review records of special-status species and habitats in the general region of the proposed KRCDPP. Also, a species list from the USFWS for Fresno County and including the applicable USGS 7.5 minute quadrangle maps were also consulted, and is included as Appendix 5.15-3. A search of the CNPS Database was also conducted. A list of potentially sensitive wildlife, plants, and habitats in the project area was developed. Lists of both the special status plant and wildlife species with the potential to occur in the KRCDPP project area are included as Tables 1 and 2 in Appendix 5.15-4.

The results of the CNDDB search showed several special-status species and habitats in the area of the proposed KRCDPP. These species and habitats are listed below and additional information about them is included in Appendices 5.15-1 and 5.15-2. Detailed information for some of these species also occurs in USFWS 1998 (Recovery Plan for Upland Species of the San Joaquin Valley, California). Also included on the USFWS list are the American Peregrine Falcon, Burrowing Owl, and Bald Eagle as they are wide ranging species of concern throughout California. Species known from the Malaga quadrangle map include:

**Birds:** Western Yellow-billed Cuckoo

**Amphibians:** California Tiger Salamander

Other species and habitats known from the eight surrounding quadrangle maps (i.e. Fresno North, Clovis, Round Mountain, Fresno South, Sanger, Caruthers, Conejo, and Selma), include:

**Mammals:** Fresno Kangaroo Rat, San Joaquin Kit Fox, San Joaquin Pocket Mouse

**Birds:** Swainson's Hawk, Tricolored Blackbird, American Peregrine Falcon, Bald Eagle, Burrowing Owl

**Amphibians:** Western Spadefoot Toad

**Invertebrates:** California Linderiella (shrimp), Molestan Blister Beetle, Valley Elderberry Longhorn Beetle, Vernal Pool Fairy Shrimp

| | |
|---|---|
| **Plants:** | Greene's Tuctoria, San Joaquin Adobe Sunburst, San Joaquin Valley Orcutt Grass, Sanford's Arrowhead, Spiny-sepaled Coyote-thistle, Succulent Owl's-clover |
| **Habitats:** | Northern Hardpan Vernal Pool<br>Northern Claypan Vernal Pool |

### *5.15.4.3 Field Surveys and Results*

A biological reconnaissance survey was conducted on September 5, 2003 to evaluate if sensitive species, habitats, or other environmental issues occur on the 19 acre project area. A reconnaissance survey was conducted for the linear facilities including the electric transmission interconnection, preferred and alternative water and sewer interconnections, and gas interconnection on September 16, 2003. Figure 5.15-1 shows the shows the survey area and results. Field surveys were completed by Mr. Jeff Halstead, KRCD Biologist. A copy of Mr. Halstead's resume is included as Appendix 5.15-5.

During the reconnaissance survey, the entire project area and routes for proposed linear facilities were driven and/or walked. The survey area was searched for any evidence of suitable habitat for sensitive species, species occurrence such as burrows, tracks, trails, prey remains, diggings, and scat (feces), prey remains, nests, sensitive plants, elderberry bushes, and sensitive habitats such as creeks, streams, and wetlands including vernal pools and swales. Also during the surveys, the three criteria of wetlands (soil, hydrology, and vegetation) were considered and visually checked on the sites.

The KRCDPP area, including the project site and construction staging and parking area, possess mainly non-native weedy grasses and forbes which have grown since the field's last disking. The area has not been leveled though it is fairly flat. The area is not native land and has been previously impacted by disking and excavation of the storm water basin. No habitat exists for special-status plant or wildlife species. Also, no sensitive habitats (such as wetlands, vernal pools, streams, creeks) were identified. Soils in the area are sandy and no evidence of vernal pool wetlands (depressions or swales, hydrology, or vegetation) occur on the site. Lands surrounding the project site are industrial developments, an abandoned vineyard, and a disked vacant lot, which provide no habitat for special-status plants or wildlife species.

Electric transmission for the KRCDPP will be provided by a new interconnection from the KRCDPP project site to the Pacific Gas and Electric (PG&E) Malaga Substation located on the northeast corner of North and Willow Avenues. A new, single 115 kilovolt

(kV) transmission interconnection line approximately three-quarters of a mile in length will interconnect the KRCDPP to the PG&E Malaga Substation. The interconnection line will run north along the eastern border of the KRCDPP site to North Avenue and then proceed east along the south side of North Avenue to the intersection of North and Willow Avenues, where it will cross North Avenue into the Malaga Substation. There is an existing PG&E 12 kV distribution line running along the south side of North Avenue. The existing poles between Chestnut and Willow Avenues would be upgraded with new taller transmission poles, which would carry the new 115kV line above the 12kV line. The route occurs along an industrial area, which includes a few residences, a church, a vineyard, and leveled and disked fields. No habitat for special-status plants or wildlife species or sensitive habitats (such as wetlands, vernal pools, stream, creeks) occur along or near the route. No special-status plants or wildlife species or sensitive habitats were identified during the field surveys.

Both water for power plant use and domestic needs will be supplied from the Malaga County Water District (MCWD) system, which has an existing supply line located along Chestnut Avenue. Currently, KRCD is considering two alternative routes for interconnection into the MCWD system. The preferred interconnection would include a linear running east from the project site, through a disked vacant lot (4.2 acres) between two residences, and under the Central Canal, a distance of approximately 750 feet to Chestnut Avenue. The secondary alternative would be to interconnect at the intersection of North and Chestnut Avenues. The proposed interconnection for the secondary alternative is approximately 2000 feet and would run north from the project site and along the south side of North Avenue to the intersection of North and Chestnut Avenues. Both routes are in an industrial and/or urban area. No habitat for special-status plants or wildlife species or sensitive habitats (such as wetlands, vernal pools, stream, creeks) occur along either route. No special-status plants or wildlife species or sensitive habitats were identified during the field surveys.

A zero liquid discharge (ZLD) system is proposed to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one offsite ZLD technology are currently being considered. Waste from the onsite ZLD technologies will be collected and transported off-site for proper disposal. The offsite ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. Wastewater from domestic wastes will be discharged to the MCWD sewer system, which is located along Chestnut Avenue. The sewer interconnection would run within the same right-of-way as either the preferred or alternative water supply linears.

Fuel for the KRCDPP will be natural gas supplied from an approximately 700 foot interconnection to the existing local PG&E gas transmission line that parallels North Avenue. No habitat for special-status plants or wildlife species or sensitive habitats (such as wetlands, vernal pools, stream, creeks) occurs along the route. No special-status plants or wildlife species or sensitive habitats were identified during the field surveys.

#### *5.15.4.4 Discussion of Impacts*

Though the CNDDB showed that a variety of special-status wildlife and plants occur in the general region of the proposed KRCDPP, no sensitive species or habitats were observed on the project site or in the area of the proposed linear facilities during the reconnaissance surveys.

Habitats for these sensitive species that occur in the general region (such as vernal pools, alkaline soils, adobe-heavy clay soils, alkali sink habitat, elderberry bushes, chenopod scrub habitat, grasslands with rolling hills, ponds, marshes, swamps, riparian forests) were also not observed. No sensitive species were identified on the KRCDPP project site or along the associated linear facilities. Wildlife and plants, which were observed on the 19 acre parcel, are typical of the disked fallow fields and vacant lots. No raptor (e.g., Swainsons Hawk or Red-tailed Hawk) nests were observed. No evidence was found to indicate that there was any significant animal movements or dispersal patterns on or through the project site or construction staging and parking area.

**Impacts to Special Status Species**

The proposed KRCDPP would affect special-status species and other wildlife species as discussed below. Impacts to special-status species or other wildlife could violate CESA and FESA, the California Fish and Game Code, CEQA, and policies of the Fresno County General Plan.

**Special-Status Plants**

The special-status plants identified in the CNDDB search are not considered likely to occur in the area of the proposed KRCDPP because they are found in communities and specific microhabitats that are not present within the area of the proposed KRCDPP. Those species that occur in the region, but do not occur in communities present in the area of the proposed KRCDPP were not considered further. The area of the proposed KRCDPP was determined to have no potential to support special-status plant species.

The proposed KRCDPP would not result in the disturbance or take of any unique, rare, endangered, or special-status species of plants. As previously described, a reconnaissance survey was conducted for special-status plants and their potential habitat. The project site

and construction staging and parking area is a disked fallow field within an industrially developed area. The proposed linear facilities would be constructed primarily along existing road rights-of-way. No special-status plants were observed during the reconnaissance survey. Habitats with the potential to support special-status plants are also not present in the area. The proposed KRCDPP would have no impact to special status plant species.

**Special-Status Wildlife**

Special-status wildlife are not considered likely to occur in the KRCDPP project area for one or more of the following reasons: (1) lack of suitable habitat; 2) species known range does not include the KRCDPP project area; (3) the species occurrence on the project site or in the location of proposed linear facilities is expected to be as an aerial transient or only occurring on occasion as a non-breeder; and (4) the local population is thought to be extirpated. Thus, species that occur in the region, but do not occur in communities present in the area of the proposed KRCDPP were not considered further. The area of the proposed KRCDPP was determined to have no potential to support special-status wildlife species.

The proposed KRCDPP would not result in the disturbance or take of any rare, threatened, endangered, or special-status species of wildlife. As previously described, a reconnaissance survey was conducted for special-status wildlife and their potential habitat. The project site and construction staging and parking area is a disked fallow field within an industrially developed area. The proposed linear facilities would be constructed primarily along existing road rights-of-way. No special-status wildlife were observed on the during the reconnaissance survey. Habitats with potential to support special-status wildlife are not present in the area. However, there is a slight chance that Western Burrowing Owl could colonize existing California Ground Squirrel burrows on the KRCDPP project site prior to construction. As a preventive measure, a preconstruction survey will be conducted for burrowing owl prior to construction. The survey and if necessary, the removal of owls from the site, would follow CDFG (1994) guidelines. The proposed KRCDPP would have no impact to special status wildlife species.

**Wildlife Including Nesting Birds and Raptors**

Wildlife diversity on the project site and in the area of the KRCDPP is limited by the type of habitat on the site, on-going disking activities, past excavation of a storm water retention basin, existing roadways, and the sites location within an industrially developed area. The project site and construction staging and parking area is a disked fallow field within an industrially developed area. The proposed linear facilities would be constructed

primarily along existing road rights-of-way. No native habitat occurs within the project area. Also, the site does not occur within or function as a wildlife movement corridor. Nesting opportunities for birds is limited in the area of the proposed KRCDPP. The existing storm water retention basin north of the project site contains a few small cottonwood trees growing within its bottom; however, no bird or raptor (hawks, kites, eagles) nests were observed during the reconnaissance survey. Many California Ground Squirrels and their burrows occur on the site. Raptors such as Red-tailed Hawk and American Kestrel would loose the opportunity to forage on the site; however, their use is thought to be minimal. Wildlife species that use the site are locally and regionally common and abundant. The proposed KRCDPP would have a less-than-significant impact on wildlife including nesting birds and raptors.

**Impacts to Riparian and Sensitive Communities**

Sensitive plant communities such as riparian, valley freshwater marsh, northern claypan vernal pool, and northern hardpan vernal pool are recognized by the CDFG, the USFWS, CEQA, and policies of the Fresno County General Plan as previously described in Section 5.15.3. A reconnaissance survey was conducted as previously described and no sensitive plant communities were observed or are known to occur in the area. The proposed KRCDPP would not result in any impact to riparian or sensitive native plant communities.

**Impacts to Wetlands**

As described previously in Section 5.15.3, wetlands are governed by the Clean Water Act, 40 CFR 230 Section 404(b) (1). The USEPA, and State of California have no net loss policies for wetlands. Also, policies of the Fresno County General Plan protect and preserve wetlands. A reconnaissance survey was conducted as previously described and no wetlands or waters of the United States were observed in the area. The proposed KRCDPP would not result in any impact to wetlands or waters of the United States.

**Impacts to the Movement of Resident and Migratory Species**

The importance of wildlife movements, travel corridors, and nursery site are noted in applicable CEQA provisions and policies of the Fresno County General Plan as previously described in Section 5.15.3. The proposed KRCDPP would not impact the movements of migratory and resident wildlife, wildlife corridors, or native wildlife nursery sites. A reconnaissance survey was conducted as previously described and no evidence of wildlife corridors, wildlife movements, or nursery sites were observed to occur in the area. No native habitat occurs within the survey area or in the vicinity of the KRCDPP where wildlife movements would occur. The proposed KRCDPP would not

result in any impact to movements of migratory and resident wildlife, wildlife corridors, or native wildlife nursery sites.

**Impacts to Biological Resources**

The importance of local policies, which protect biological resources, are noted in CEQA and in the policies of the Fresno County General Plan, as described previously in Section 5.15.3. The proposed KRCDPP will not conflict with and is compatible with policies of the Fresno County General Plan regarding biological resources. The proposed KRCDPP would result in no impact to local policies or ordinances protecting biological resources.

**Impacts to Conservation Plans**

The importance of conservation plans and policies that protect biological resources are noted in CEQA and in the policies of the Fresno County General Plan, as previously described in Section 5.15.3. There is no habitat conservation plan or natural community conservation plan that applies to the area of the proposed KRCDPP and therefore there is no impact associated with the proposed KRCDPP.

### 5.15.5 Proposed Mitigation Measures

No negative or adverse impacts will occur to biological resources, including special-status species and habitats and thus no mitigation is proposed as a result of the proposed KRCDPP. As a preventive measure, a preconstruction survey will be conducted for the Western Burrowing Owl prior to construction. The survey and if necessary, the removal of owls from the site, would follow CDFG (1994) guidelines.

### 5.15.6 Cumulative Impacts

The KRCDPP project site is a disked fallow field within an industrially developed area and the linear facilities would be located primarily along existing road rights-of-way. The project site and linear facilities possess no significant biological resources including special-status species, their habitats, or sensitive habitats (such as wetlands, vernal pools, streams, creeks). No cumulative impacts are expected to biological resources associated with the KRCDPP. Any incremental impacts to biological resources are not cumulatively considerable and are of a *de minimus* level. Biological resources in the project area will be essentially the same whether or not the proposed KRCDPP is implemented.

### 5.15.7 References

Arnold, R.A., J.A. Halstead, D. Kavanaugh, & K.H. Osborne, 1994. Valley Elderberry Longhorn Beetle. Pages 414-415. In Thelander, C.G., and M. Crabtree,

editors. Life on the edge: a guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 pp.

Arroues, K.D. & C.H. Anderson, Jr. Soil Survey of Kings County, California. U.S. Department of Agriculture, Soil Conservation Service.

Bass, R.E., A.I. Herson, & K.M. Bogdan, 2002. CEQA Deskbook. Solano Press Books, Point Arena, California.

Barr, C.B, 1991. Distribution, status, and habitat of the valley elderberry longhorn beetle, Desmocerus californicus dimorphus (Insecta: Coleoptera: Cerambycidae). Sacramento, California.

Beedy, E.C., S.D. Sanders, & D. Bloom, 1991. Breeding status, distribution, and habitat associations of the tricolored blackbird (Agelaius tricolor), 1850-1989. Prepared for the U.S. Fish and Wildlife Service, Sacramento, California. 202 pp.

Bloom, P.H, 1980. The Status of the Swainson's Hawk in California, 1979. Federal Aid in Wildlife Restoration, Project W-54-R-12, Final Report 11-8-0. California Department of Fish and Game, Wildlife Management Division, Nongame Bird and Mammal Section. Sacramento, California. 24 pp.

Brylski, P. & A.I. Roest, 1994. Fresno kangaroo rat. Pages 76-77. In Thelander, C.G., and M. Crabtree, editors. Life on the edge: a guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 pp.

Brylski, P., B.L. Cypher, A.I. Roest, & C. Uptain, 1994. Tipton kangaroo rat. Pages 78-79. In Thelander, C.G., and M. Crabtree, editors. Life on the edge: a guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 pp.

Burt, W. H. & R. P. Grossenheider, 1976. A Field Guide to the Mammals. Houghton Mifflin Co., Boston, Massachusetts. 289 pp.

California Department of Fish and Game (CDFG)

CDFG, 1980. At the Crossroads 1980: A report on California's endangered and rare fish and wildlife. Sacramento, California. 147 pp.

CDFG, 1990. Survey Methodologies for the San Joaquin Kit Fox, Blunt-nosed Leopard Lizard, San Joaquin Antelope Squirrel, Tipton Kangaroo Rat, Giant Kangaroo Rat. Fresno, California.

CDFG, 1990. 1989 annual report on the Status of California's State Listed Threatened and Endangered Plants and Animals. Sacramento, California. 188 pp.

CDFG (J. Brode), 1990. Guidelines for procedures and timing of activities related to the modification or relocation of giant garter snake habitat. Sacramento, California.

CDFG, 1992. 1991 Annual report on the status of California state listed threatened and endangered animals and plants. Sacramento, California..

CDFG, 1994. Staff Report Regarding Mitigation for Swainson's Hawk (Buteo swansoni) in the Central Valley of California. Fresno, California.

CDFG, 1994. Draft Staff Report on the Burrowing Owl Mitigation. Region 4. Fresno, California.

CDFG (McCauley, J. and J. R. Single), 1995. Riparian and Wetland Habitats: Descriptions, Human Impacts, and Recommended Setbacks for Impact Management. Draft Regional Report, Region 4, Fresno, California.

CDFG, 1999. California Wildlife Habitat Relationships System, ver. 7.0. Wildlife and Habitat Data Analysis Branch, Sacramento, California.

CDFG, 2003. Special Animals List. Wildlife and Habitat Data Analysis Branch, Sacramento, California.

CDFG, 2003. Special Vascular Plants, Bryophytes, and Lichens List. Wildlife and Habitat Data Analysis Branch, Sacramento, California.

CDFG, 2003. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Wildlife and Habitat Data Analysis Branch, Sacramento, California.

California Native Plant Society, 2003. Inventory of Rare and Endangered Vascular Plants of California. Electronic Data Base. Sacramento, California.

California Natural Diversity Data Base, 2002. Rarefind Program: Computer data base of sensitive species. California Department of Fish and Game, Natural Heritage Division, Sacramento, California.

California Office of Planning and Research, 1996. CEQA: California Environmental Quality Act Statutes and Guidelines. Sacramento, California.

Chapman, J.A. & G.A. Feldhamer, 1982. Wild Mammals of North America: Biology, Management, Economics. The Johns Hopkins Univ. Press, London, England. 1147 pp.

Crampton, B., 1959. The grass genera Orcuttia and Neostapfia: A study in habitat and morphological specialization. Madrono 15: 97-100.

Crampton, B., 1977. California Native Plant Society rare plant status report for Orcuttia californica var. inequalis. California Native Plant Society. Sacramento, California.

Detrich, P.J., 1985. The status and distribution of the Bald Eagle in California. M.S. Thesis, California State University, Chico. 101 pp.

Ehrlich, P.R., D.S. Dobkin & D. Wheye, 1988. The birder's handbook: a field guide to the Natural history of North American birds. Simon and Schuster, New York, New York.

Eng, L.L., D. Belk, & C.H. Eriksen, 1990. California Anostraca: Distribution, habitat, and status. Journal of Crustacean Biology 10:247-277.

Environmental Science Associates, 2003. Proposed Malaga City Incorporation: Program Environmental Impact Report (Draft). Prepared for Fresno Local Agency Formation Commission. Fresno, California

Eriksen, C.H. & D. Belk, 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press, Inc. Eureka, California.

Estep, J.A., 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California. California Department of Fish & Game, Sacramento, California. 70 pp.

Faber, P.M. & R.F. Holland, 1988. Common Riparian Plants of California. Pickleweed Press, Mill Valley, California.

Federal Interagency Committee for Wetlands Delineation, 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U. S. Government Printing Office, Washington, D. C.

Fisher, R., G. Hansen, R.W. Hansen, & G. Stewart, 1994. Giant garter snake. Pages 284-287. In Thelander, C.G., and M. Crabtree, editors. Life on the edge: a guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 pp.

Fresno County, 2000. Fresno County General Plan. Fresno, California.

Halstead, J.A & J.A. Oldham, 1990. A revision of the genus Desmocerus, with special emphasis on the threatened valley elderberry longhorn beetle. Research Rpt. No. 90-002, Kings River Conservation District, Fresno, California.

Halstead, J.A. & J.A. Oldham, 2000. New distributional records for the elderberry longhorn beetle Desmocerus californicus Horn (Coleoptera: Cerambycidae). Pan-Pacific Entomol. 76: 74-76.

Halstead, J.A. & R.D. Haines, 1991. New distributional records for some candidate species of Lytta Blister Beetles in California. Pan-Pacific Entomol. 68: 68-69.

Hansen, R. W., 1980. Western aquatic garter snakes in central California: an ecological and evolutionary perspective. Masters thesis. California State University Fresno. Fresno, California.

Hickman, J.C., 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley and Los Angeles, California.

Holland, D.C., 1991. A synopsis of the ecology and status of the Western Pond Turtle (Clemmys marorata) in 1991. U. S. Fish and Wildlife Service, San Simeon, California.

Holland, R.F., 1986. Descriptions of the Terrestrial Natural Communities of California. Special Publ. California Department of Fish and Game, Sacramento, California.

Huntington, G.L., 1971. Soil survey of Eastern Fresno County, U. S. Department of Agriculture, Soil Conservation Service.

Ingles, L.G., 1965. Mammals of the Pacific States: California, Oregon, and Washington. Stanford Univ. Press, Stanford, California. 506 pp.

Kings River Conservation District, 1992. Sensitive Element Inventory: Phase I - A summary Of the California Natural Diversity Data Base for the Kings River Conservation District Service Area. Research Report No. 92-002. Fresno, California.

Jennings, M.R. & M.P. Hayes, 1994. Amphibians and reptile species of special concern in California. California Department of Fish and Game. Rancho Cordova, California.

Jones and Stokes, 2003. Plano Street Bridge Widening Project. Initial Study / Mitigated Negative Declaration. City of Porterville. Porterville, California.

Linsley, E.G. & J.A. Chemsak, 1972. Cerambycidae of North America, Part VI, No. 1. Taxonomy and classification of the subfamily Lepturinae. University of California publications in Entomology 69. 138 pp.

Mayer, K.E., & W.F. Laudenslayer, 1988. A guide to wildlife habitats of California. California Department of Forestry and Fir Protection, Sacramento, California. 166 pp.

McKernan, R. & M. Whitfield, 1994. Willow Flycatcher Pages 206-270 In: G. Thelander And M. Crabtree (editors). Life on the edge: a guide to California's endangered Natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 pp.

Morrell, S.H., 1972. Life history of the San Joaquin kit fox. California Fish and Game 58: 162-174.

Moyle, P.B., 1976. Inland fishes of California. University of California Press, Berkeley. 405 pp.

Moyle, P.B., R. Yoshoyama, J.E. Williams, & E.D. Wikramanayake, 1995. Fish Species of Special Concern in California. Second Edition. California Department of Fish and Game. Rancho Cordova. 272 pp.

Nature Serve Explorer: An online encyclopedia of life. 2001. Version 1.6. Arlington,Virginia, USA: NatureServe. Available:
http://www.natureserve.org/explorer. Accessed: 2003.

O'Farell, T.P., 1983. San Joaquin Kit Fox Recovery Plan. Prepared for the U. S. Fish and Wildlife Service, Portland, Oregon.

Orloff, S.G., 1989. Survey techniques for the San Joaquin kit fox (Vulpes macrotis mutica). Endangered Wildlife Technical Workshop. San Joaquin Valley Chapter of The Wildlife Society. 17 pp.

Prichard, D., 1994. Riparian Area Management: Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas. Technical Reference 1737-11. U. S. Bureau of Land Management, Denver, Colorado.

Reeder, J.R., 1982. Systematics of the tribe Orcuttieae (Gramineae) and the description of a new segregate genus, Tuctoria. American Journal of Botany 69: 1082-1095.

Remsen, J.V., Jr., 1978. Bird species of special concern in California: An annotated list of declining or vulnerable bird species. California Department of Fish and Game, Administrative Report No. 78-1. Sacramento, California. 53 pp.

Robbins, C.S., B. Bruun, & H.S. Zim, 1966. A Guide to Field Identification: Birds of North America. Western Publishing Company, Inc., Racine, Wisconsin.

Sawyer, J.O. & T.K. Wolf, 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California.

Selander, R.B., 1960. Bionomics, Systematics, and Phylogeny of Lytta, a Genus of Blister Beetle (Coleoptera: Meloidae). Illinois Biol. Monographs, No. 28. The University of Illinois Press, Urbana, Illinois. 295 pp.

Skinner, M.W. & B.M. Pavlik, 1994. California Native Plant Society Inventory of Rare And Endangered Valcular Plants of California. 5th edition. Special Publication No. 1. California Native Plant Society. Sacramento, California.

Stebbins, R.C., 1966. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston, Massachusetts. 279 pp.

Stone, R.D., et al., 1988. Status survey of the Grass Tribe Orcuttieae in the Central Valley of California. Prepared by Biosystems Analysis under contract to the U. S. Fish and Wildlife Service, Sacramento, California.

Taylor, D.W., & W.B. Davilla, 1986. Status survey of three plants endemic to the San Joaquin Valley and adjacent areas, California. Prepared by Biosystems Analysis under contract to the U. S. Fish and Wildlife Service, Sacramento, California.

Thelander, C.G. & M. Crabtree, 1994. Life on the edge: a guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, California. 550 p.

U. S. Army Corps of Engineers, 1987. Wetlands Delineation Manual. Technical Report Y-87-1, Department of the Army, Washington, D. C.

U. S. Department of Justice & County of Fresno, 2002. Juvenile Justice Campus, Fresno County California. Environmental Impact Statement / Environmental Impact Report. Washington, D. C. and Fresno, California.

United States Fish and Wildlife Service (USFWS)

USFWS, 1984. alley Elderberry Longhorn Beetle Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 62 pp.

USFWS, 1985. Revised Blunt-nosed Leopard Lizard Recovery Plan. U.S. Fish and Wildlife Service, Region 1, Portland, Oregon. 85 pp.

USFWS, 1985. Draft Habitat Suitability Index Model: Western Spadefoot Toad. Sacramento, California.

USFWS, 1988. Habitat Suitability Index Model: Red-legged Frog. Sacramento, California.

USFWS, 1989. Habitat Suitability Index Model: California Tiger Salamander. Sacramento, California.

USFWS, 1993. Endangered and threatened wildlife and plants: determination of threatened status for the giant garter snake. Federal Register Vol. 58, No. 201.

USFWS, 1997. San Joaquin Kit Fox Survey Protocol for the Northern Range. Sacramento, California.

USFWS, 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, Oregon. 319 pp.

USFWS, 1999. Conservation guidelines for the valley elderberry longhorn beetle. Sacramento, California.

USFWS, 1999. Draft recovery plan for the Giant Garter Snake (Thamnophis gigas). Region 1, Portland, Oregon. 192 pp.

USFWS, 2002. Recovery plans for the California Red-legged Frog (Rana aurora draytonii). Region 1, Portland, Oregon. 173 pp.

USFWS, 2003. Species Lists for Counties and Quadrangle Maps. Electronic Data Base. Sacramento, California.

Verner, J. & A.S. Boss, 1980. California wildlife and their habitats: western Sierra Nevada.

Gen. Tech. Rep. PSW-37, 439 p., illus. Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, Berkeley, California.

Whitson, T.D. et al., 1996. Weeds of the West. Pioneer of Jackson Hole, Jackson, Wyoming.

Williams, D.F., 1986. Mammalian Species of Special Concern in California. California Department of Fish and Game, Administrative Report 86-1, Sacramento, California. 112 pp.

Williams, D.F., S. Byrne, & T.A. Rado, 1987. Endangered and Sensitive Species of the San Joaquin Valley, California: A Conference on Their Biology, Management, and Conservation. California State College, Bakersfield.

Williams, D. & D.J. Germano, 1992. Recovery of endangered kangaroo rats in the San Joaquin Valley, California. Trans. Western Sec. The Wildl. Soc. 28: 93-106.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, & M. White, 1990. California's wildlife. Volume I-amphibians and reptiles. Volume II-birds. VolumeIII-mammals. Electronic Version. California Department of Fish and Game. Sacramento, California.

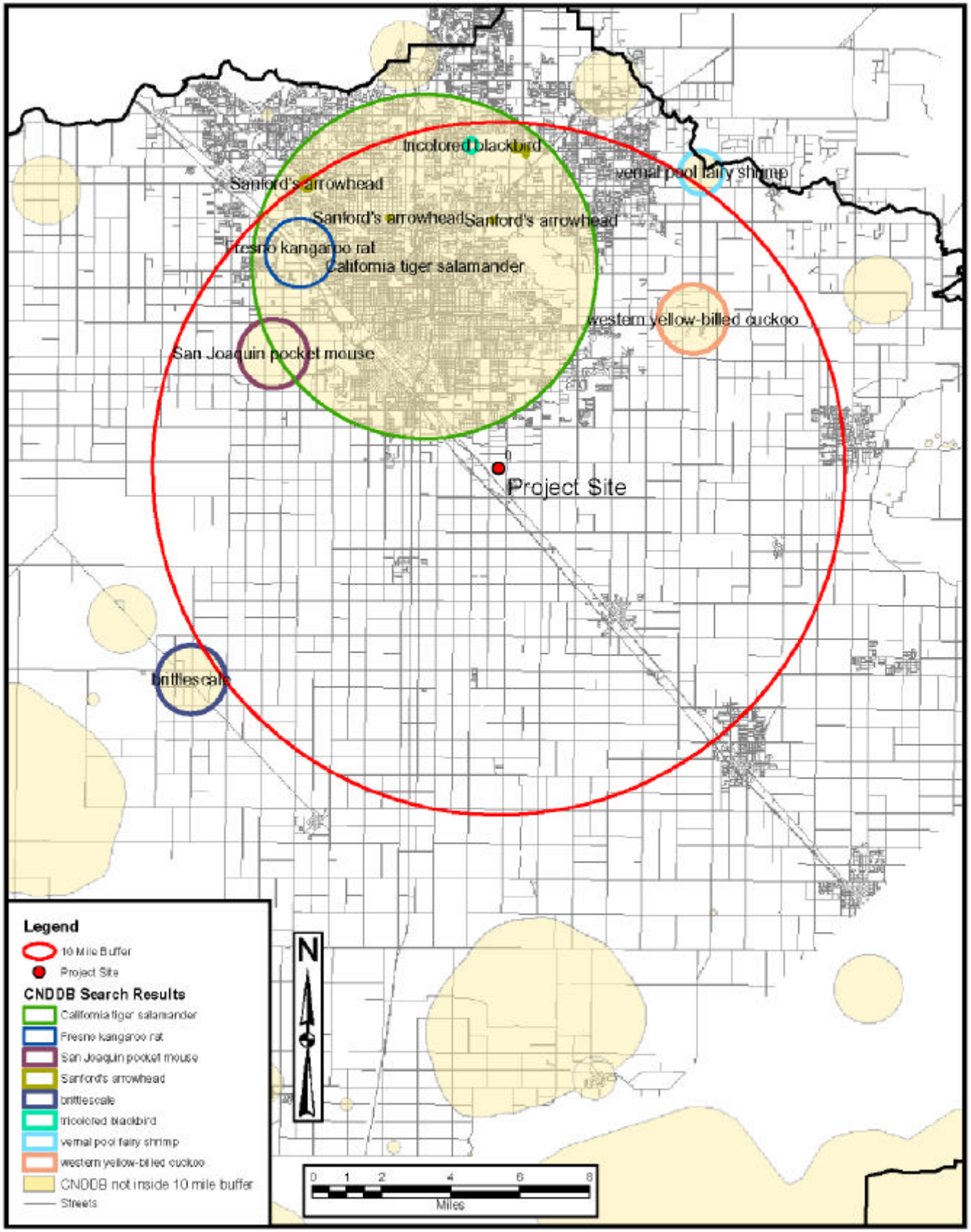



FIGURE 5.15-1

Biological Resources

KRCDPP

KRCD
Kings River Conservation District

# CHAPTER 6.0 PROJECT ALTERNATIVES

## 6.1 INTRODUCTION

In accordance with California Energy Commission (CEC) Guidelines (CEC 2000, as updated), this section identifies and evaluates alternatives that were considered in the development of the proposed Kings River Conservation District Peaking Plant (KRCDPP), including the alternative of no power plant (i.e. the No Project Alternative). Appendix F (f) of the CEC Guidelines (*Ibid.*) requires a discussion of the proposed alternatives to the power plant, including the No Project Alternative. Project alternatives are analyzed relative to their ability to meet key project objectives. Alternatives evaluated in this chapter include the No Project Alternative, alternative project sites, alternative routings for linear facilities, alternatives for water supply and wastewater discharge, and alternative project designs and configurations.

## 6.2 NO PROJECT ALTERNATIVE

Under the No Project Alternative, Kings River Conservation District (KRCD) would not construct the proposed KRCDPP. Under this scenario, the California Department of Water Resources (CDWR) would need to obtain peaking power from an alternate source. This alternate source would also need to meet the contractual generation requirements of the long-term Power Purchase Agreement (PPA) that currently exists between KRCD and CDWR for generation from the KRCDPP.

Likely alternative generation sources would include existing, older generating facilities or another newly developed peaking project. The No Project Alternative would therefore still result in emissions and environmental effects, either from an existing facility or from development of a new project site (if a new peaking project were used to supply the power). Development of another peaking project would result in the development of another site, possibly a greenfield site with more potential for environmental effects than the proposed site, which is a brownfield site located in an industrial area that is already zoned industrial.

The No Project Alternative does not meet the State of California's objectives for increased peaking generation. The state's primary objectives are to provide for the development of peaking power plant units using the LM6000 generators that were received by the State of California as part of the settlement agreement with respect to the PPA between CDWR and Williams Energy Marketing and Trading Company (Williams Energy) and to add the additional peaking generating capacity in areas of the State of California with the greatest demand. Development of the proposed KRCDPP is helping

the state fulfill its goals. The No Project Alternative also does not meet KRCDs objective of adding additional generation within their service territory to meet existing and growing demand. The No Project Alternative does not meet the contractual obligations of the PPA between KRCD and CDWR for the development and operation of the proposed KRCDPP. The No Project Alternative has been determined to be infeasible.

## 6.3 DEVELOPMENT OF THE PROJECT AT ONE-SITE VERSUS TWO SITES

After executing the PPA with CDWR, KRCD began considering the development alternatives for the proposed KRCDPP. These were 1) to develop two separate peaking units on two separate sites with separate linear facilities for gas, electric transmission and water supply (i.e. the Two Site alternative), or 2) locate both peaking units on the same site with shared linear facilities for gas, electric transmission and water supply (i.e. the One Site alternative).

KRCD conducted an assessment of these two alternatives to consider the relative impacts that each would have on the overall cost and schedule required for development of the proposed KRCDPP, including differences in environmental review and permitting, site development and capital equipment, and the quantity and price of required emission offsets needed to mitigate impacts to air quality. This assessment was shared with CDWR and the California Power Authority (CPA). Under terms of the PPA between KRCD and CDWR, both CDWR and the CPA are active participants in the planning and development of the proposed KRCDPP. KRCD requested a recommendation from CDWR on which alternative to pursue. Based on a consideration of the assessment, CDWR made the final recommendation that KRCD proceed with the development of the One Site Alternative.

## 6.4 ALTERNATIVE SITE LOCATIONS

### 6.4.1 Preliminary Site Evaluation

Soon after execution of the PPA, KRCD began identifying potential sites for development of either the Two Site or One Site alternative. The KRCD PPA specified that the proposed project be developed within the KRCD service area, which covers 1.2 million acres in portions of Fresno, Kings and Tulare counties. KRCD originally identified 23 potential sites within their service territory and based on close proximity to natural gas and electric transmission supplies. These sites were located throughout Fresno and Kings Counties. No sites were identified in Tulare County since there would be no direct benefit to consumers in the Fresno area, and since there were no areas identified in close proximity to sufficient gas and electric transmission supplies. Table 6.4-1 includes a list of these sites including some basic information on land use, zoning, ownership,

potential water supply sources, and distances to natural gas and electric transmission supplies.

KRCD then performed a more detailed screening evaluation of both natural gas and electric transmission interconnection capabilities at each site based on Pacific Gas and Electric (PG&E) system maps and examination of previous gas and power flow studies. In addition, a preliminary identification of sensitive biological resources, using the California Natural Diversity Database (CNDDB) was also completed. Table 6.4-2 summarizes the results of the CNDDB search and identifies potential sensitive species at each site. Based on this initial screening, the list of 23 sites was reduced down to five sites, four of which were located in Fresno County with the 5th in Kings County.

After the initial screening, one additional site (identified as Site 24 or the DG Herndon Site) was added to the list, for a total of six sites. The six primary sites were then evaluated relative to each other using factors such as land purchase/lease availability, zoning, construction access, distance from nearest sensitive receptors, natural gas and electric transmission interconnection costs and overall development costs including land costs. Table 6.4-3 provides additional information for the six primary sites including the relative advantages and disadvantages and the reasons for which some of the sites were eliminated from further evaluation. Figure 6.4-1 shows the locations of the six primary sites in relation to KRCD district boundaries. Based on this additional review the list of six sites was further reduced down to two sites.

### 6.4.2 Secondary Site Evaluation

The two sites remaining after the preliminary site evaluation were Site 19 (i.e. the Malaga Site) and Site 24 (i.e. the DG Herndon). Site 19 is a parcel located near the intersection of North and Chestnut Avenues and near the Community of Malaga, in Fresno County. At this site, the proposed KRCDPP would be electrically interconnected at 115 kilovolts (kV) to the PG&E 115 kV Malaga Substation, approximately three-quarters of a mile distant. Site 19 is currently vacant and zoned industrial. Site 24 is located on Golden State Boulevard near Highway 99 in the northern part of the City of Fresno, in Fresno County. At this site, the proposed KRCDPP would be electrically interconnected at 230 kV to an existing circuit that passes over the site, which is interconnected to the PG&E 230 kV Herndon Substation. DG Power, Inc., an independent power producer, has attempted to develop an LM6000 based peaking unit (rated at 49 megawatts (MW)) on Site 24 in the past few years. The CEC listed Site 24 as having sufficient land space, transmission capacity, natural gas fuel supply within one mile, availability of emission offsets and a lack of known potential fatal flaws.

**Table 6.4-1**
**Preliminary Information for Initial Sites Identified**
**KRCDPP**

| No. | Description | Zoning | Current Use | Transmission Distance | | Natural Gas Distance | | Assessors Parcel Number | County | Water Source | Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 110kV + | 60kV | | | | | | |
| 1 | Melga Reservoir | Unknown Code | Fallow | 1000 ft. | | SCG | <100 ft | 028-280-013-000 | Kings | Reservoir/ Ground Water | 640 |
| 2 | 7480 Hanford-Armona Rd. | Unknown Code | Rendering | 100 ft. | 100 ft. | SCG | <200 ft | 016-070-012-000 | Kings | Waste Water Residential, Ground Water, Canal | 80 |
| 3 | Cornelia - Mt. Whitney | Industrial | Gas/Oil | 1000 ft. | 200 ft. | SCG | <100 ft | 053-150-44M | Fresno | Ground Water | 37.5 |
| 4 | Avenal – 198 Cutoff | Agricultural Preserve | Fallow | 300 ft. | | SCG | <100 ft | 024-190-008-000 | Kings | Ground Water, Reservoir, Waste Water | 64.7 |
| 5 | Grantland Avenue 26 1/2 | Agriculture | Field Crop | 3 miles | 3 miles | SCG | <4000 ft | 041-100-32S | Fresno | Ground Water, Surface Water | 430 |
| 6 | Conejo - Del Rey | Agriculture | Unkempt Orchard | 100 ft. | | PGE | <1500 ft | 393-211-15 | Fresno | Ground Water, Waste Water Reservoir | 39.1 |

**Table 6.4-1**
**Preliminary Information for Initial Sites Identified**
**KRCDPP**

| No. | Description | Zoning | Current Use | Transmission Distance | | Natural Gas Distance | | Assessors Parcel Number | County | Water Source | Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 110kV + | 60kV | | | | | | |
| 7 | Floral – Del Rey | Agriculture | Vineyard | 100 ft. | | SCG | <100 ft | 358-050-12 | Fresno | Ground Water | 20 |
| 8 | North of McCall substation | Agriculture | Orchard | 100 ft. | | PGE | <100 ft | 345-031-20 | Fresno | Ground Water | 22.51 |
| 9 | Adams – Bethel | Agriculture | Dehydrator | | 100 ft. | PGE | <100 ft | 350-060-34 | Fresno | Ground Water | 18.44 |
| 10 | Adams - Del Rey | Agriculture | Vineyard, Orchard | 100 ft. | | PGE | <100 ft | 353-020-07S | Fresno | Ground Water | 40 |
| 11 | North - Peach | Agriculture | For Sale/Fallow | <700 ft. | 100 ft. | PGE | <100 ft | 331-008-48S | Fresno | Ground Water, City Supply | 27.96 |
| 12 | Cornelia D-180/Belmont | Agriculture | Unkempt Vineyard | | 100 ft. | PGE | <100 ft | 326-050-21 | Fresno | Ground Water | 39 |
| 13 | McKenzie – Hayes | M-1 | For Lease | 200 ft. | | PGE | <100 ft | 326-040-34S | Fresno | Ground Water | 5.5 |
| 14 | North - East of Dickenson | Agriculture | House, shop, vineyard | 100 ft. | 100 ft. | PGE | <100 ft | 025-060-09S | Fresno | Ground Water | 76.1 |
| 15 | McMullin – 145 | Agriculture | Vineyard, orchard, construction | 100 ft. | | MOBIL | <100 ft | 035-100-09S | Fresno | Ground Water, Canal | 229.2 |

**Table 6.4-1**
**Preliminary Information for Initial Sites Identified**
**KRCDPP**

| No. | Description | Zoning | Current Use | Transmission Distance | | Natural Gas Distance | | Assessors Parcel Number | County | Water Source | Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 110kV + | 60kV | | | | | | |
| 16 | Jensen – 145 (North Ave.) | Misc. | Radio Station/Substation | 100 ft. | 100 ft. | MOBIL | <100 ft | 025-160-11S | Fresno | Ground Water, Waste Water Reservoir | 113.6 |
| 17 | Adams - Fruit | Agriculture | Vineyard, Orchard | 200 ft. | | PGE | <100 ft | 334-37-07 | Fresno | Ground Water | 17.66 |
| 18 | Adams – Walnut | Agriculture | Vineyard, Orchard | | | PGE | <100 ft | 335-06-17S | Fresno | Ground Water | 75.53 |
| 19 | Malaga | Industrial | Industrial | <500 ft. | 100 ft. | PGE | <100 ft | 330-050-23 | Fresno | Ground Water, City | 18 |
| 20 | Excelsior – Mt. Whitney | Agriculture | Field Crop | 2 mi. | 2 mi. | SCG | <1.5 mi | See Section | Fresno | Ground Water, Surface Water | |
| 21 | Jensen WWTP | Agriculture | Fallow/Substation | <100 ft. | <100 ft | PGE | 1.5 mi | 327-030-38T | Fresno | Ground Water, Reservoir, Waste Water | 80 |
| 22 | Herndon – Weber | Industrial | PG&E Substation | <200 ft. | <100 ft | PGE | <100 ft | 504-13-24T | Fresno | Ground Water, Surface Water | 42 |

**Table 6.4-1**
**Preliminary Information for Initial Sites Identified**
**KRCDPP**

| No. | Description | Zoning | Current Use | Transmission Distance | | Natural Gas Distance | | Assessors Parcel Number | County | Water Source | Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 110kV + | 60kV | | | | | | |
| 23 | Herndon - Thiele | Residential | Fallow (?) | <700 ft. | | PGE | <500 ft | 504-050-02 | Fresno | Ground Water | 14.48 |
| 24 | DG Herndon | Industrial | Light Industrial | <100 ft. | | PGE | <100 ft. | 505-080-22S | Fresno | City Supply | 12 |

Acronyms:
PGE – Pacific Gas and Electric
SCG – Southern California Gas Company
FMFCD – Fresno Metropolitan Flood Control District
RWRF – Regional Waste Water Reclamation Facility
WWTP –Waste Water Treatment Plant
Source: KRCD, 2003

| Table 6.4-2<br>Preliminary Screening of Biological Resources by USGS Quadrangle Map<br>KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| | | General Location | | | Native Vegetation Parcels within 1 mile of the Site[1] | CNDDB Preliminary Screening Results[2]<br>Common Name/Listing Status (State/Federal) |
| Site No. | USGS Quadrangle Map | Township | Range | Section | | |
| 1 | Waukena | 20S | 22E | 27 | Yes | San Joaquin Kit Fox-CT/FE<br>Swainsons Hawk-CT/<br>Blunt-nosed Leopard Lizard-CE/FP, FE<br>Vernal Pool Fairy Shrimp- /FT |
| 2 | Remnoy | 18S | 19E | 33 | No | San Joaquin Kit Fox-CT/FE<br>Swainsons Hawk-CT/ |
| 3 | Burrel | 17S | 19E | 27 | No | San Joaquin Kit Fox-CT/FE<br>Swainsons Hawk-CT/<br>Giant Garter Snake-CT/FT<br>Western Spadefoot Toad- SSC/ |
| 4 | Lemoore | 19S | 19E | 25 | Yes | San Joaquin Kit Fox-CT/FE<br>Tipton Kangaroo Rat-CE/FE |
| ~~5~~[3] | ~~N/A~~ | - | - | - | - | ~~None~~ |
| 6 | Selma | 16S | 22E | 28 | Yes | None |
| 7 | Selma | 15S | 22E | 33 | No | None |
| 8 | Conejo | 15S | 21E | 24 | Yes | None |
| 9 | Sanger | 15S | 22E | 10 | No | Western Yellow-Billed Cuckoo-CT, CE/<br>Greene's Orcutt Grass-CR, FE |
| 10 | Sanger | 15S | 22E | 17 | No | Western Yellow-Billed Cuckoo-CT, CE/<br>Valley Elderberry Longhorn Beetle- /FT<br>Greene's Orcutt Grass-CR, FE |
| 11 | Malaga | 14S | 21E | 29 | Yes | Western Yellow-Billed Cuckoo-CT, CE/ |
| 12 | Kearney Park | 14S | 19E | 2 | No | Fresno Kangaroo Rat -CR, CE/FE |
| 13 | Kearney Park | 14S | 19E | 3 | Yes | Fresno Kangaroo Rat-CR, CE/FE |
| 14 | Kearney Park | 14S | 18E | 24 | Yes | Fresno Kangaroo Rat-CR, CE/FE |

**Table 6.4-2**
**Preliminary Screening of Biological Resources by USGS Quadrangle Map**
**KRCDPP**

| Site No. | USGS Quadrangle Map | General Location | | | Native Vegetation Parcels within 1 mile of the Site[1] | CNDDB Preliminary Screening Results[2] Common Name/Listing Status (State/Federal) |
|---|---|---|---|---|---|---|
| | | Township | Range | Section | | |
| 15 | Helm | 15S | 18E | 30 | Yes | San Joaquin Kit Fox-CT/FE<br>Giant Garter Snake-CT/FT<br>Brittlescale- List 1B<br>Lesser Saltscale- List 1B<br>Recurved Larkspur- List 1B |
| 16 | Kerman | 14S | 18E | 19 | Yes | San Joaquin Kit Fox-CT/FE<br>Heartscale – List 1B<br>Brittlescale – List 1B<br>Palmate=Bracted Bird's Beak-CE/FE |
| 17 | Fresno South | 15S | 20E | 8 | Yes | San Joaquin Pocket Mouse- /FSC |
| 18 | Fresno South | 15S | 20E | 17 | Yes | San Joaquin Pocket Mouse- /FSC |
| 19 | Malaga | 14S | 20E | 36 | Yes | Western Yellow-Billed Cuckoo-CT, CE |
| 20 | Burrel | 17S | 18E | 25 | Yes | San Joaquin Kit Fox-CT/FE<br>Swainson's Hawk-CT<br>Blunt-Nosed Leopard Lizard-CE/FP,FE<br>Vernal Pool Fairy Shrimp- /FT<br>Subtle Orache – List 1B |
| 21 | N/A | - | - | - | - | None |
| 22 | Herndon | 12S | 19E | 32 | Yes | San Joaquin Pocket Mouse- /FSC<br>Valley Elderberry Longhorn Beetle- /FT<br>Hairy Orcutt Grass-CE/FE |
| 23 | Kearney Park | 14S | 19E | 22 | Yes | Fresno Kangaroo Rat-CR, CE/FE |
| 24 | DG Herndon | 12S | 19E | 32 | Yes | San Joaquin Pocket Mouse- /FSC<br>Valley Elderberry Longhorn Beetle- /FT<br>Hairy Orcutt Grass-CE/FE |

**Table 6.4-2**
**Preliminary Screening of Biological Resources by USGS Quadrangle Map**
**KRCDPP**

| Site No. | USGS Quadrangle Map | General Location | | | Native Vegetation Parcels within 1 mile of the Site[1] | CNDDB Preliminary Screening Results[2] Common Name/Listing Status (State/Federal) |
|---|---|---|---|---|---|---|
| | | Township | Range | Section | | |

[1] CDWR Vegetation maps
[2] The results of the CNDDB show these species were identified on the same quadrangle map as the site, but are not necessarily located on or in the direct vicinity of the site.
[3] Site eliminated from consideration.

**Acronyms:**
USGS: United States Geological Survey
List 1B: California Native Plant Society Listing - Rare, threatened or endangered in California and elsewhere
CNDDB: California Natural Diversity Database

**State Listing:**
CT=California Threatened
CE=California Endangered
FP=Fully Protected
SSC=Species of Special Concern
CR=California Rare

**Federal Listing:**
FE =Federal Endangered
FT=Federal Threatened
FSC=Federal Species of Concern

| Table 6.4-3<br>Summary of Primary Sites Considered<br>KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| **Factors Considered** | **Site 11<br>North –Peach** | **Site 13<br>McKenzie-Hayes** | **Site 17<br>Adams-Fruit** | **Site 19<br>Malaga** | **Site 23<br>Herndon-Weber** | **Site 24<br>DG Herndon** |
| PG&E Electric Interconnect | | | | | | |
| -Interconnection Voltage | 115 kV | 230 kV | 115 kV | 115 kV | 115 kV | 230 kV |
| -Interconnection Type | Radial | Looping | Looping | Radial | Radial | Looping |
| -Capacity (in megawatts) | 175 | 100+ | 100+ | 175 | 100+ | >200 |
| -Power Flow during Peak Periods | Into Fresno | Into Fresno | Into Fresno | Into Fresno | Into Fresno | Into Fresno |
| PG&E Gas Interconnection Line | Line 138 | Unknown | Unknown | Line 138 | Line 118 | Line 118 |
| Water/Waste Water | Malaga System | Unknown | Ground Water Onsite Disposal | Malaga System/other | Fresno System | Fresno System |
| Land Status: | | | | | | |
| -Current Zoning | Agriculture | M-1 Industrial | Agriculture | Industrial | M-1 Industrial | Industrial |
| -Size (in Acres) | 18 | 5.5 | 17.7 | 18 | 12 | 12 |
| - Land Use | Fallow | Fallow | Vineyard, Orchard | Vacant, Industrial | Industrial | Part Vacant, Industrial |
| Native Vegetation on or near Site[1] | Yes | Yes | Yes | Yes | Yes | No |
| Biological Fatal Flaws (i.e. potential for special status species to occur on or near the project site) | No | No | No | No | No | No |
| Constructability/Access | Adjacent to Major Roads | Adjacent to Major Roads | Rural Roads | Adjacent to Major Roads | Adjacent to Major Roads | Adjacent to Major Roads |
| Distance from Nearest Sensitive Receptor | <500 feet | <500 feet | >1000 feet | <300 feet | >1000 feet | >1000 feet |
| Distance from KRCD Operational Center | <1 mile | >5 miles | >5 miles | <1 mile | >5 miles | >5 miles |
| Current Ownership of Land | PPG Industries | Edward Barry | Dwayne Cardoza | Producers Holding | J.R. Lawson | Lawson Trucking Company |

| Table 6.4-3<br>Summary of Primary Sites Considered<br>KRCDPP | | | | | | |
|---|---|---|---|---|---|---|
| **Factors Considered** | **Site 11<br>North –Peach** | **Site 13<br>McKenzie-Hayes** | **Site 17<br>Adams-Fruit** | **Site 19<br>Malaga** | **Site 23<br>Herndon-Weber** | **Site 24<br>DG Herndon** |
| | | | | Company | | |
| Willing to Sell, Lease, Option | No | For Lease | For Sale | For Sale | No | For Sale |
| Relative Advantages | Radial electric intertie, voltage support to local 115 kV system | No linears required, no rezone needed | Close to gas transmission. Remote area | Radial electric intertie, voltage support to local 115 kV system, , no rezone required | Near PG&E Herndon substation | Permits and Interconnect studies already complete, higher transmission reliability, no rezone and no electric linear required |
| Relative Disadvantages | Need rezoning, close to residential, lower transmission reliability | Looping 230 kV interconnect required | Must be rezoned, Looping 115 kV interconnect required. | One-half mile linear down major street, close to residential | Site was located outside of KRCD district boundaries, near future residential development, near San Joaquin River basin | Looping 230 kV interconnect required, One-mile gas pipeline required |
| **Reason Site was Eliminated from Consideration** | **Owner unwilling to sell or lease property** | **Electric interconnection costs too high and near residential zoning** | **Electric interconnection costs too high and rezoning requirements.** | **Site ultimately identified as preferred site** | **High cost and near environmentally sensitive areas** | **High Interconnect Cost** |
| [1] CDWR Vegetation Maps | | | | | | |

#### *6.4.2.1 Environmental Considerations*

This section provides a brief comparison of the potential environmental impacts associated with the remaining two sites being considered for development of the KRCDPP, Site 19 and Site 24. Additional information on environmental factors with the other sites originally considered is included in tables 6.4-1, 6.4-2 and 6.4-3, above.

With regard to potential environmental impacts, the biggest difference between the remaining two sites is the location of residences in close proximity to Site 19. This includes five residences located east of the project site along Chestnut Avenue and 8 residences and a church located along the north side of North Avenue and 2 residences on the south side of North Avenue between the project site and the PG&E Malaga Substation. The area of Site 19 is industrial and there is no land in the area that is zoned or would likely be used to expand the residential area. The closest residential receptors to Site 24 are approximately one mile from the site.

**Air Quality**

The type and quantity of emissions produced as a result of construction and operation of the proposed KRCDPP would be similar at each site. Impacts on human populations would however differ due to the proximity of Site 19 to a small number of residences from the site and along the proposed transmission line route. Site 24 is located approximately one-mile from the closest residential area. All air impacts at either site would be reduced to less than significant with the implementation of appropriate mitigation measures.

**Noise**

The potential for noise impacts to nearby sensitive receptors is greater at Site 19 due to the close proximity to a small number of residences. Site 24 is surrounded by industry on three sides and Highway 99 neighboring on the fourth side, with the nearest residential area approximately one-mile from the site. However, any potential noise impacts at Site 19 resulting from the proposed KRCDPP would be reduced to less than significant levels through design features (i.e., fitting the generators with silencers) and with the implementation of appropriate mitigation measures.

**Water Resources**

Water is available at each site. Water supply at Site 19 would be provided by the Malaga County Water District (MCWD) system via an interconnection of approximately 1000 to 2000 feet. Wastewater from domestic use would be discharged to the MCWD sewer system via an interconnection in the same right-of-way as the water supply. Water supply at Site 24 would likely come from the City of Fresno water system via an interconnection at the property boundary. Wastewater from domestic use would be discharged to the City

of Fresno sewer system via an interconnection at the property boundary. There would be no significant impact to water resources at either site.

**Visual Resources**

The potential for visual impacts is greater at Site 19 both due to the proximity of a small number of residences and also due to the need for an approximately three-quarters of a mile-long electric transmission line. The nearest residential area to Site 24 is approximately one-mile away and the site would not likely not require a new transmission line. Any potential visual impacts to nearby sensitive receptors would be reduced to less than significant levels through KRCDPP design (i.e., laying out the site so buildings block the view of the generating unit) and with the implementation of appropriate mitigation measures.

There is an existing PG&E 12 kV distribution line running along the majority of the proposed transmission line route for Site 19. The existing poles would be upgraded with new taller wooden transmission poles, which would carry the new 115 kV line above the 12 kV line. The proposed transmission line would be located along existing roadways. While the upgraded line would change the visual character of the existing line and add to the cumulative visual effects of the area, any impacts would be mitigated to a less than significant level through KRCDPP design, including placing the linear within the right-of-way and viewshed of the existing transmission lines and with the implementation of appropriate mitigation measures.

**Land Use**

There would be no substantial difference of land use issues between the two sites. There would be no significant land use impacts associated with either site. Both sites are currently zoned industrial and therefore would not require a rezone or General Plan amendment.

**Agriculture and Soils**

Both sites are previously disturbed and are located in industrial areas. There would be no significant impact to agriculture and soils associated with either site.

**Traffic and Transportation**

Site 19 is located on the property adjacent to where the LM6000 turbine generators and associated equipment are being stored. Site 24 is approximately 10 miles from the equipment storage area and would require use of major roads and highways for equipment transport, resulting in a greater potential for an impact on traffic volumes. With the implementation of appropriate mitigation measures, there would be no significant impacts to traffic and transportation associated with either site.

### Public Health

Site 19 has the greater potential for expose of the public to health impacts due to the proximity of a small number of residences. However, these impacts would be reduced to insignificant levels through the implementation of appropriate mitigation measures.

### Worker Health and Safety

The worker health and safety impacts from either Site 19 or Site 24 would be the same since construction and operational practices of the proposed KRCDPP would be the same at either location. There would be no significant impacts to public health associated with either site.

### Hazardous Materials and Waste Management

The same quantities and types of hazardous materials would be used and stored on both sites. The same quantity of waste would also be generated and need to be disposed of at both sites. There would be no significant impact from hazardous materials and waste management at either site.

### Geologic Resources and Hazards

Both sites would likely be subject to the same geologic hazards. There would be no significant impact from geologic resources and hazards at either site.

### Socioeconomics

There would be no difference in socioeconomic impacts or benefits at either site, since construction and operation of the proposed KRCDPP would be the same at each location. There would be no significant impact to socioeconomic resources at either site.

### Cultural Resources

Each site provides the same potential for the discovery of cultural resources. Any impacts to cultural resources at either site would be mitigated to less than significant levels through the implementation of appropriate mitigation measures.

### Paleontological Resources

Each site provides the same potential for the discovery of paleontological resources. Any impacts to paleontological resources at either site would be mitigated to less than significant levels through the implementation of appropriate mitigation measures.

**Biological Resources**

Each site provides the same potential for the discovery of biological resources. The potential for the discovery of biological resources at each site is very low, given that both sites are currently and have historically been used for industrial purposes. Any impacts to biological resources at either site would be mitigated to less than significant levels through the implementation of appropriate mitigation measures.

### 6.4.3 Final Site Selection

The primary criteria considered in the site selection process were availability of electric transmission and gas interconnections, cost of these interconnections and overall development costs. CDWR, as an active participant in the planning and development of the proposed KRCDPP, also has the objective of developing the project at the lowest reasonable cost.

To assist in the site selection process, an electric System Impact Study (SIS) was requested from PG&E for Site 19. This was then compared to the SIS that had previously been completed for Site 24. Also, a natural gas system impact study was requested from PG&E for Site 19. This was also compared with the study that had previously been completed for Site 24. Based on review of available information on the sites, associated pros and cons of each site, estimated development costs, and electric and gas interconnection costs, the final recommendation was made to proceed with Site 19 as the preferred site for development of the KRCDPP.

### 6.4.4 Preferred Site

The preferred site for development of the KRCDPP is Site 19. KRCD currently has an option to purchase approximately 19 acres of land located in an industrial area south of the City of Fresno and near the Community of Malaga. The project site would consist of the southern 9.5 acres of the property. The northern 9.5 acres would be used for temporary construction staging and parking areas. An access road and right-of-ways for the gas and electric transmission interconnections and right-of-ways for the alternative water supply and sewer sources would also cross the northern 9.5 acres. An existing 4-acre storm water basin is located on the southern portion of the northern 9.5 acres. The basin would be used for storm water discharge associated with construction of the KRCDPP. The project site is shown on Figure 1.2-3, in Chapter 1, Executive Summary.

## 6.5 ALTERNATIVE LINEAR FACILITIES

As described in detail in Chapter 2.0, Project and Facility Description, the linear facilities associated with the KRCDPP include an electric transmission interconnection, a gas interconnection, and preferred and alternative water and sewer interconnections. Figure 1.2-3, in Chapter 1 shows the project site, including staging and laydown areas, parking

areas, and the associated linear facilities. These linears would be primarily constructed along existing road rights-of-way. The environmental impacts associated with the linear facilities are described in Chapter 5, Environmental Considerations.

None of the proposed linear facilities resulted in the potential for a significant environmental impact. The linear facilities associated with the proposed KRCDPP are short in length and are primarily located along existing road rights of way thus minimizing the potential for environmental impacts. The linear facilities also primarily represent the shortest possible interconnections, specifically in the case of gas and electric transmission. Therefore, no alternative linear facilities are being proposed due to the short length of the proposed linear facilities and the absence of feasible alternatives with lower environmental impacts.

There were some minor routing alternatives considered in relation to how the proposed linear route would interconnect into the 9.5 acre project site. These routing alternatives all involved crossing the 9.5 acre parcel adjacent to the north and the options were to place the linears on either the east or west side of the 4-acre basin. Since the western end of the basin is the shallow end, an access road from North Avenue to the project site would be constructed there and the linear facilities would be placed within the right-of-way of the access road, thus further minimizing potential impacts. Environmental impacts associated with minor routing alternatives were not substantially different than the proposed route and neither option resulted in a significant environmental impact.

Alternative water supply linears were considered, as they related to water supply alternatives, and these are discussed below. To minimize the potential for impacts the interconnection of domestic sewer is proposed to be located within the same right-of-way as the water supply interconnection.

## 6.6 ALTERNATIVE WATER SUPPLIES

This section discusses alternative water supply sources that were considered for the KRCDPP.

### 6.6.1 Use of Effluent

The use of secondary effluent from the Malaga Waste Water Treatment Facility (MWWTF) was evaluated as a potential alternative water supply for domestic, cooling, and process water demands. The MWWTF is located approximately one mile south and west of the proposed KRCDPP project site. To use this water, a pipeline would have to be constructed to the KRCDPP project site. This would be difficult, given the infrastructures that exist between KRCDPP and MWWTF. Located between the MWWTF and KRCDPP are three Union Pacific Railroad tracks, two major highways (Golden State

Freeway and State Route 99), the Central Canal and also one of its diversions, Fresno Colony Canal both of which are operated and maintained by Fresno Irrigation District.

It is estimated that a water pipeline from the MWWTF to the KRCDPP would cost approximately $1.5 million dollars, which represents a 7 percent increase in the Engineering, Procurement, and Construction (EPC) costs of the KRCDPP. In addition, to utilize this water for KRCDPP fire protection will require an emergency diesel fired pump and may require a larger water storage tank to be located on the project site for fire protection. The routing of this pipeline will require approvals and construction coordination with the California Department of Transportation, Union Pacific and the canal owners that could result in delays of the project online date significantly beyond the current schedule. The current online date for the KRCDPP is in compliance with KRCD's PPA with CDWR, as previously discussed.

Delivering water to the KRCDPP from the MWWTF would require building a pumping station. This would decrease plant reliability, increase operating cost and reduce the net efficiency of the KRCDPP. Effluent water quality from water treatment plant would most likely require extra treatment requirement for the KRCDPP water treatment and zero liquid discharge (ZLD) systems. The organic characteristics of the effluent water could pose operating problems for the KRCDPP operator.

The use of effluent as the source of water may still require construction of an extension of the potable water distribution system to provide reliability of supply. The tertiary effluent does not provide redundancy in the event of pump failure or a break in the treated effluent pipeline. The MCWD would typically require construction of potable water distribution lines across the entire frontage of property, regardless of the use of tertiary effluent.

Use of water from the MWWTF also doesn't necessarily help lower the groundwater overdraft that exists in the area. The treated water from the MWWTF is currently used to recharge the same aquifer that MCWD draws on to supply the residential and industrial area surrounding the KRCDPP. Thus the use of MCWD water has the same net effect on the local aquifer as using the effluent water from the treatment plant.

The next closest wastewater treatment plant to the KRCDPP is the Fresno-Clovis Regional Wastewater Reclamation Facility that is located over 10 miles from the project site and located on the corner of Cornelia Avenue and Jensen Avenue. A pipeline between the site and the treatment plant is uneconomical due to the cost to install the pipeline. There are potentially significant impacts associated with construction through populated areas and existing public infrastructures. As with the MWWTF, constructing a

pipeline under 2 major freeways, across 9 miles of prime farmland, adjacent, if not through, a US Environmental Protection Agency (USEPA) superfund site, and across a major irrigation canal would most likely result in a significant push of the KRCDPP start date. The current online date for the KRCDPP is in compliance with KRCD's PPA with CDWR, as previously discussed.

### 6.6.2 Surface Water

The only major surface waters in the project vicinity are the Central Canal and the Fresno Colony Canal. The surface water from these canals have been diverted from the Kings River through Fresno Main Canal to be used for beneficial agricultural uses; therefore, would not provide a feasible alternative for water supply for the proposed KRCDPP.

### 6.6.3 Other Alternative Water Supplies

In accordance to the State Water Resource Board resolution 75-58, other alternative water supplies evaluated for the proposed KRCDPP also included the use of ocean water, brackish water from natural sources or irrigation return flow, inland wastewater of low total dissolved solids, or other inland waters. KRCDPP is over 100 miles from the Pacific Ocean, deeming the use of ocean water for power plant cooling to be infeasible. Brackish water or irrigation return flows were considered; however, due to the nature of the location of the proposed KRCDPP, and that fact that is it located up gradient from any large farming operations, the use of this type of water was found infeasible. The potential for the use of inland wastewater, such as that found in wastewater treatment plants was also considered as previously discussed.

## 6.7 ALTERNATIVE WASTEWATER DISCHARGE OPTIONS

There were alternatives originally considered for process wastewater disposal from the proposed KRCDPP. The first alternative was to construct two interconnections from the KRCDPP for the disposal of its domestic and process water supplies. This waste would go directly to the MWWTF. It was then determined that the electro-conductivity limits at the MWWTF would be exceeded if the proposed KRCDPP were to interconnect to the MWWTF for the disposal of process wastewater. To prevent the compounding of existing wastewater conditions, KRCDPP proposes to only connect to the MCWD sewer system for domestic waste. MCWD has confirmed that adequate capacity is available for KRCDPP domestic waste.

The second and preferred alternative for process wastewater and to minimize the potential for impacts associated with the discharge of water used for power plant cooling is to design the KRCDPP with a ZLD system to treat process wastewater and thus eliminate wastewater discharge from the KRCDPP. Two onsite ZLD technologies and one off-site ZLD technology are currently being considered. Waste from the onsite ZLD

technologies will be collected and transported off-site for proper disposal. The off-site ZLD technology will utilize a portable water treatment system, which is periodically replaced as the treatment system is consumed. The decision of the type of ZLD system will be decided during project engineering and design.

The ZLD will result in less potential for impacts than with the discharge of power plant cooling water to either land, or other surface waters. The ZLD system also has the advantage of making the maximum use of water supplies. Use of the ZLD system also reduces peak water needs for KRCDPP operation from 270 gallons per minute (gpm) to 210 gpm with the ZLD system. The ZLD system is discussed further in Chapter 2, Project and Facility Description.

Since the design of the ZLD system provides for the method of wastewater discharge with the least potential for environmental impacts, no other wastewater discharge methods are being considered.

## 6.8 ALTERNATIVE PROJECT CONFIGURATIONS

Under terms of the PPA between KRCD and CDWR, KRCD is required to develop a peaking power project utilizing the two General Electric (GE) LM6000 Sprint generating units that were obtained by the State of California under terms of a settlement agreement with Williams Energy. Other technologies or configurations that could have been considered absent the available generating units and the PPA (i.e. combined cycle, larger industrial combustion turbines, reciprocating engines, etc.) are therefore not applicable. Alternative configurations considered were therefore limited to those discussed below.

### 6.8.1 Evaporative Coolers Versus Chillers

The LM6000 generating units received by KRCD were equipped with evaporative coolers to cool the turbine inlet air. Although evaporative coolers are effective in producing significant turbine power boost over a design with no inlet air-cooling, power output will still vary significantly with ambient conditions (temperature and humidity). Evaporative coolers also reduce efficiency due to higher auxiliary loads.

An alternative to the evaporative coolers is an inlet air chilling system (i.e. chillers). A chiller system is capable of cooling the turbine inlet air to the same condition at all times. This provides an extra power boost over evaporative coolers that are more constant and reliable. While the chillers offer greater power output than evaporative coolers (approximately 10 MW), the tradeoff is a higher capital cost. A chiller system also requires a separate cooling system, including either a wet cooling tower or dry cooling (ie. an air heat exchanger). This is discussed further below.

To determine whether evaporative coolers or chillers would be most beneficial to the proposed KRCDPP, a detailed analysis of the performance with both systems was performed. The results of the analysis showed that it would be cost-effective for chillers to be installed on the proposed KCDPP in lieu of evaporative coolers.

As previously discussed above and in Chapter 1, Executive Summary, CDWR and the CPA are active participants in the planning and development of the proposed KRCDPP. In that regard, CDWR made the final recommendation to equip the proposed KRCDPP with chillers.

### 6.8.2 Dry Cooling (Air Heat Exchanger) Versus Wet Cooling

As discussed above, an inlet air chiller system requires a separate cooling system, including either a wet cooling tower or dry cooling (ie. an air heat exchanger). Use of a wet cooling tower would increase the KRCDPP water consumption and wastewater discharge by approximately 25 percent over a configuration with no chillers.

An alternative form of cooling for the chiller system would be a dry system in which the reject heat load is sent into the atmosphere using an air heat exchanger. This reduces the water consumption of the chiller system. However, the overall effectiveness (ability to cool inlet air) of the chiller system is reduced, while increasing its cost, noise emissions and site space required for the equipment.

The use of a wet cooling tower is preferred because of the lower capital costs, lower operating costs, higher efficiency and because KRCDPP water usage is not significantly reduced if an air heat exchanger is used. The use of dry cooling was determined to not be feasible for the proposed KRCDPP because it does not meet the State of California's objectives for developing the project as cost effectively as possible.

## 6.9 ALTERNATIVE TECHNOLOGIES

The output from the proposed KRCDPP would be sold to CDWR in accordance with KRCD PPA with CDWR. It is the objective of CDWR to develop the proposed KRCDPP in the most cost effective manner possible. In addition, and under terms of the PPA between KRCD and CDWR, KRCD is required to develop a peaking power project utilizing the two natural-gas fired GE LM6000 Sprint generating units that were obtained by the State of California under terms of a settlement agreement with Williams Energy. Other technologies that could have been considered absent the available generating units and the PPA (including nuclear, hydroelectric, biomass, solar and wind) are therefore not applicable.

In accordance with the requirements of the PPA, KRCD is proceeding with the development of the GE units, which are natural-gas fired and operated in simple-cycle technology.

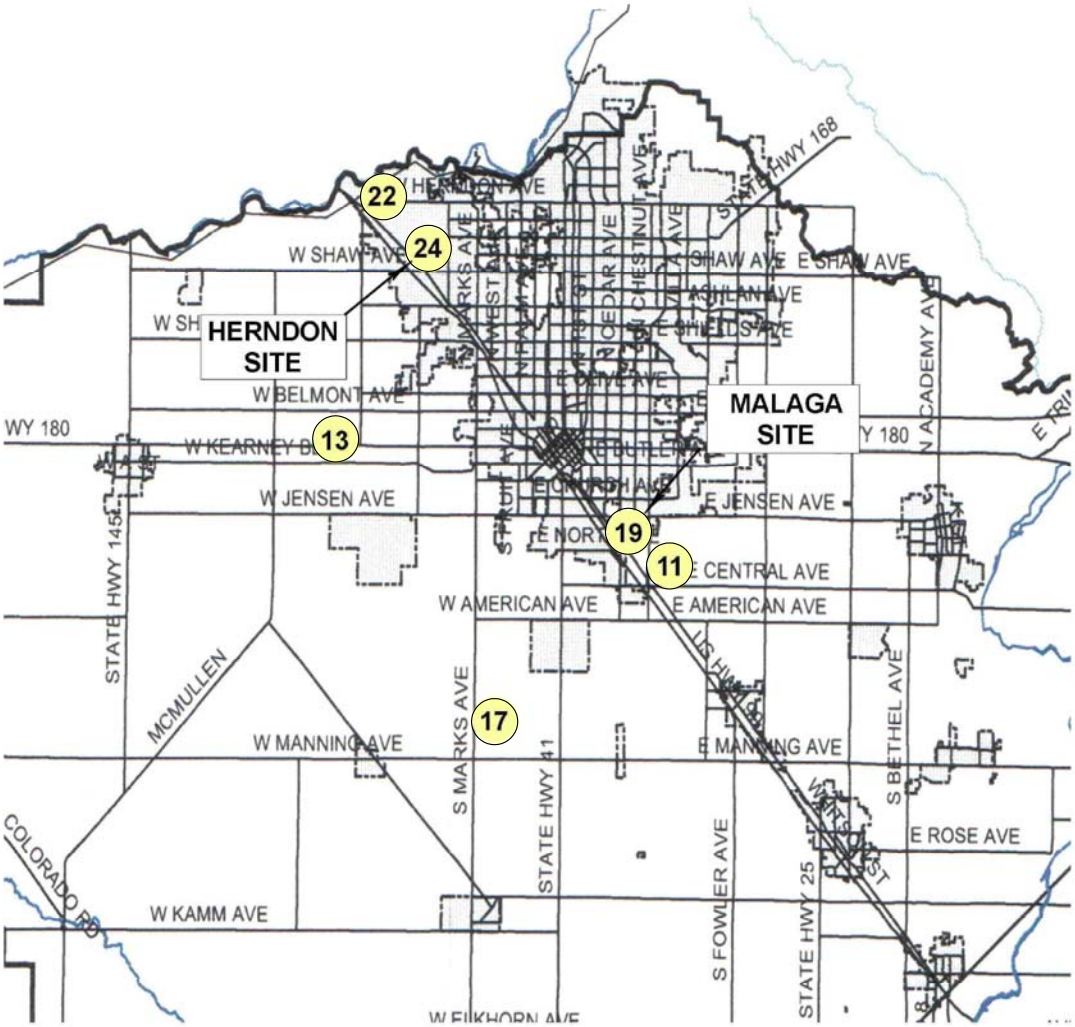
## 6.10 REFERENCES

CEC, 2001. Report to the Governor on Potential Peaking Power Plant Sites in California 2001 to 2003. Prepared by the California Energy Commission Staff. February 2001.

CH2M Hill, 2003. MID Electric Generation Station (03-SPPE-1). SPPE Supplement A (Zero-liquid Discharge Arrangement). Submitted by Modesto Irrigation District. June 20, 2003.

KRCD, 2002. Description of Potential Sites for the LM6000 Peaking Project – Draft Report. Prepared by Kings River Conservation District.

KRCD, 2003. Updated Assessment for Alternative Sites for Development of an LM6000 Generating Peaking Plant. Kings River Conservation District. August 2003.




## Alternative Locations

| ID | Site Location |
|---|---|
| 11 | North-Peach |
| 13 | McKenzie-Hayes |
| 17 | Adams-Fruit |
| 19 | Malaga |
| 22 | Herndon-Thiele |
| 24 | DG-Herndon |

KRCD
Kings River Conservation District

FIGURE 6.4-1

KRCDPP Alternative
Site Locations
KRCDPP

# CHAPTER 7.0 LIST OF PREPARERS

Table 7.0-1 contains a list of the primary author(s) of each chapter and resource section of the Kings River Conservation District Peaking Plant (KRCDPP) Small Power Plant Exemption (SPPE) application. The Kings River Conservation District (KRCD) will develop, construct own and operate the KRCDPP.

**Table 7.0-1**
**List of Preparers**
**KRCDPP**

| Chapter/ Section | Title | Primary Preparer(s) | Company Name/Affiliation |
|---|---|---|---|
| 1 | Executive Summary | Amy Cuellar | Navigant Consulting, Inc. |
| 2 | Project Description | Max Walenciak<br><br>Joshua Doering | Navigant Consulting, Inc.<br><br>Integrated Engineers and Contractors Corporation |
| 3 | Engineering and Design Criteria | Max Walenciak | Navigant Consulting, Inc. |
| 4 | Energy Resources and Efficiency | Amy Cuellar | Navigant Consulting, Inc. |
| 5 | Environmental Information: | | |
| 5.1 | Air Quality | Thor Hibbeler<br>Robbi Keil | Navigant Consulting, Inc.<br>Consultant |
| 5.2 | Noise | Jim Brennan | Bollard and Brennan, Inc. |
| 5.3 | Water Resources | Scott Redelfs<br>Patrick Campbell | KRCD<br>KRCD |
| 5.4 | Visual Resource | Marsha Gale | Environmental Vision |
| 5.5 | Land Use | Patrick Campbell<br>Amy Cuellar | KRCD<br>Navigant Consulting, Inc. |
| 5.6 | Agriculture and Soils | Patrick Campbell | KRCD |
| 5.7 | Traffic and Transportation | James Davis<br>John Wilson | Navigant Consulting, Inc.<br>Wilson Engineering |
| 5.8 | Public Health | Thor Hibbeler | Navigant Consulting, Inc. |
| 5.9 | Worker Health and Safety | James Davis | Navigant Consulting, Inc. |
| 5.10 | Hazardous Materials and Waste Management | Thor Hibbeler<br>Max Walenciak<br>Robbi Keil | Navigant Consulting, Inc.<br>Navigant Consulting, Inc.<br>Consultant |
| 5.11 | Geologic Resources and Hazards | Richard Shatz<br>Juliana Harris | GEI Consultants/Bookman-Edmonston<br>GEI Consultants/Bookman-Edmonston |
| 5.12 | Socioeconomics | Don Wagenet | Navigant Consulting, Inc. |
| 5.13 | Cultural Resources | Leigh Martin | William Self Associates |
| 5.14 | Paleontological Resources | Paul Murphey | SWCA Environmental Consultants |

| Table 7.0-1<br>List of Preparers<br>KRCDPP | | | |
|---|---|---|---|
| **Chapter/ Section** | **Title** | **Primary Preparer(s)** | **Company Name/Affiliation** |
| 5.15 | Biological Resources | Jeff Halstead | KRCD |
| 6 | Alternatives | Jack Sinor<br>Paul Maxwell<br>Amy Cuellar | KRCD<br>Navigant Consulting, Inc.<br>Navigant Consulting, Inc. |
| 7 | List of Preparers | Amy Cuellar | Navigant Consulting, Inc. |
| | Administrative Support, Document Formatting, Quality Control | Janne Graham<br>James Davis | Navigant Consulting, Inc.<br>Navigant Consulting, Inc. |
| | Graphics | Gary Parker<br>Patrick Campbell | GEI Consultants/Bookman-Edmonston<br>KRCD |
| | KRCDPP Project Management | Jack Sinor<br>Paul Maxwell | KRCD<br>Navigant Consulting, Inc. |
| | SPPE Project Management | Scott Redelfs<br>Amy Cuellar | KRCD<br>Navigant Consulting, Inc |
| | Project Development Assistance | Dick Ferreria<br>Tom Flynn<br>Chuck Toney<br>Ziyad Mansour<br><br>Jim Henneforth | California Power Authority<br>California Power Authority<br>California Department of Water Resources<br>California Department of Water Resources<br><br>Consultant to California Department of Water Resources |
| | Contributing Authors | | Pacific Gas and Electric Company<br><br>Malaga County Water District |