PACIFIC GAS AND ELECTRIC COMPANY HYDRODIVESTITURE DRAFT EIR

TABLE OF CONTENTS

CD users: For index links to files click on Index.htm file.

VOLUME 1

NOTICE OF AVAILABILITY

TABLE OF CONTENTS/LIST OF TABLES/LIST OF FIGURES

EXECUTIVE SUMMARY

1. INTRODUCTION

1.1	Purpose of the Environmental Impact Report	1-1
1.2	Requested Actions	1-1
1.3	Project Overview	1-2
	1.3.1 Historic Overview of Pacific Gas and Electric Company	1-2
	1.3.2 Electricity Restructuring and Divestiture	1-3
	1.3.3 Pacific Gas and Electric Company's Proposed Auction Process	1-5
	1.3.4 Key Areas of Environmental Concern	1-6
1.4	CPUC Decision-Making Process	1-7
	1.4.1 General Proceeding	1-8
	1.4.2 Decisionmaking	1-8
1.5	CEQA Process	1-9
	1.5.1 Environmental Effects	1-9
	1.5.2 Alternatives	1-10
	1.5.3 Public and Agency Consultation	1-10
	1.5.3.1 Notice of Preparation	1-10
	1.5.3.2 Public Agency Participation Program	1-10
	1.5.3.3 Public Scoping for Environmental Review	1-11
	1.5.4 Draft EIR	1-11
	1.5.5 Final EIR Certification	1-12
	1.5.6 Mitigation Monitoring and Reporting	1-12
1.6	Organization of the EIR	1-12
PRO	DJECT DESCRIPTION	
2.1	Introduction	2-1
2.2	Project Objectives	2-2
2.3	Description of the Proposed Auction and Divestiture	2-6

2.

		2.3.1	Asset Bundling 2.3.1.1 Closing Conditions	2-6 2-7
			2.3.1.2 Closing Timing	2-7
	2.4	Overview	v of the Hydroelectric Power System and Generating Process	2-8
		2.4.1	Typical Hydroelectric Generation Facilities	2-8
		2.4.2	Hydrological Cycle	2-31
		2.4.3	Siting of Hydroelectric Generation Facilities	2-33
		2.4.4	Hydroelectric Energy Production in California	2-33
		2.4.5	Load and Generation Patterns	2-34
	2.5	Terms of	f the Proposed Transfer of Facilities to New Owners	2-35
		2.5.1	Transfer of Rights and Interests in Pacific Gas and Electric	
			Company-owned Assets	2-36
		2.5.2	Assumption of Obligations and Liabilities	2-36
		2.5.3	Operations and Maintenance Services	2-36
		2.5.4	Retained Assets, Rights and Obligations	2-37
		2.5.5	Shared Access and Shared Facilities Agreements	2-37
		2.5.6	Non-Binding Agreements and Practices	2-38
		2.5.7	Information Disclosures	2-38
	2.6	Pacific C	Gas and Electric Company's Use of Hydroelectric Resources	2-38
		2.6.1	Market Structure Implemented by Electric Restructuring	2-39
		2.6.2	Generation Strategies	2-41
		2.6.3	Bidding Strategies and the Ancillary Services Market	2-43
		2.6.4	Water Management Strategies	2-44
	2.7	Location	and Characterization of Pacific Gas and Electric	
			pany's Hydroelectric and Land Assets	2-45
		2.7.1	Water Rights	2-46
		2.7.2	Land Interests	2-47
		2.8.3	Informal Agreements, Contractual Obligations,	
			and Other Encumbrances	2-50
	2.8	Descripti	ions of the Assets to Be Sold	2-53
		2.8.1	Shasta Regional Bundle	2-54
		2.8.2	DeSabla Regional Bundle	2-71
		2.8.3	Drum Regional Bundle	2-88
		2.8.4	Motherlode Regional Bundle	2-105
		2.8.5	Kings Crane-Helms Regional Bundle	2-119
	2.9	Intended	Uses of the EIR	2-138
	2.10	Reference	es	2-139
3.	APP	ROACH '	TO ENVIRONMENTAL ANALYSIS	
	3.1	Introduct	tion	3-1
	3.2	Impacts a	and Mitigation Measures	3-2
		3.2.1	Types of Impacts	3-2
		3.2.2	Mitigation Measures	3-2
	3.3	Restructu	ring and Divestiture	3-4
	3.4		Conditions / Environmental Setting	3-4
		3.4.1	Settings for Non-Water-Related Environmental Topics	3-4
		3.4.2	Settings For Water-Related Topics	3-5
			_	

3.5	Environi	mental Baseline	3-5
	3.5.1	Non-Water-Related Environmental Topics	3-5
	3.5.2	Water-Related Environmental Topics	3-5
3.6	Analysis	Years	3-6
3.7	Binding	Versus Non-Binding Agreements and Practices	3-7
	3.7.1	Approach to Non-Binding Agreements and Practices	3-7
	3.7.2	Documentation of Non-binding Agreements and Practices	3-8
	3.7.3	Documentation of Binding Agreements.	3-8
3.8	Bundling	g of Hydroelectric Assets for Divestiture	3-9
3.9	FERC R	estrictions and Operational Constraints	3-10
	3.9.1	FPA Section 4(e)	3-10
	3.9.2	Clean Water Act	3-11
3.10	Assumpt	ions Regarding Future Changes	3-13
	3.10.1	Future Hydrological Operation Changes	3-13
		3.10.1.1 Basic Ownership Scenarios	3-14
		3.10.1.2 Hydrologic Modeling Process and Results	3-22
	3.10.2	Future Land Development Assumptions	3-40
		3.10.2.1 Introduction	3-40
		3.10.2.2 General Methodology and Assumptions	3-41
		3.10.2.3 Specific Methodology for Future Land Use	
		Development Analysis	3-42
		3.10.2.4 Development Estimated for the Purposes of Analysis	3-46
	3.10.3	Timber Harvest Assumptions	3-83
		3.10.3.1 General Background and Assumptions	3-83
		3.10.3.2 Timber Harvest Plans	3-84
		3.10.3.3 Projections of Future Change in Timber Harvest Practice	3-85
	3.10.4	Future Water Rights and Contract Changes	3-108
	3.10.5	Future Mineral Extraction Changes	3-110
		3.10.5.1 Introduction	3-110
		3.10.5.2 Methodology	3-110
		3.10.5.3 Mineral Development Assumptions	3-112
3.11	Other Re	elated Projects	3-112
	3.11.1	Introduction	3-112
	3.11.2	Projects Before the CPUC	3-113
		3.11.2.1 McArthur Swamp	3-113
		3.11.2.2 Burney Falls	3-113
	3.11.3	Projects Before the Federal Energy Regulatory Commission (FERC)	3-114
		3.11.3.1 Potter Valley Project (FERC 0077	3-114
		3.11.3.2 Mokelumne Project (FERC 0137)	3-114
		3.11.3.3 Rock Creek-Cresta Project (FERC 1962)	3-115
		VOLUME 2	
ENV	IRONMI	ENTAL SETTING, IMPACTS, AND MITIGATION MEASURES	
4.1	Land Us	e	4.1-1
	4.1.1	Introduction to Land Use	4.1-1
	4.1.2	System-Wide Regulatory Context	4.1-1

4.

		4.1.2.1 Federal Regulations and Policies	4.1-1
		4.1.2.2 State Regulations and Policies	4.1-3
	4.1.3	System-Wide Setting	4.1-5
		Regional and Local Setting and Regulatory Context	4.1-7
		4.1.4.1 Shasta Regional Bundle	4.1-7
		4.1.4.2 DeSabla Regional Bundle	4.1-18
		4.1.4.3 Drum Regional Bundle	4.1-33
		4.1.4.4 Motherlode Regional Bundle	4.1-44
		4.1.4.5 Kings Crane-Helms Regional Bundle	4.1-53
	4.1.5	Standards of Significance	4.1-67
	4.1.6	Analytical Methods	4.1-69
		4.1.6.1 Impact Assessment Methodology	4.1-69
		4.1.6.2 Other Types of Impacts Caused by Land Use Changes	4.1-70
		Introduction to Impacts and Mitigation Measures	4.1-70
	4.1.8	Impact, Analysis, and Mitigation Measures	4.1.70
		4.1.8.1 Impact 1-1: Shasta Regional Bundle	4.1-71
		4.1.8.2 Impact 1-1: DeSabla Regional Bundle	4.1-84
		4.1.8.3 Impact 1-1: Drum Regional Bundle	4.1-88
		4.1.8.4 Impact 1-1: Motherlode Regional Bundle	4.1-93
		4.1.8.5 Impact 1-1: Kings Crane-Helms Regional Bundle	4.1-96
		4.1.8.6 Evaluation of Impact 1-1 to Entire System	4.1-102
		4.1.8.7 Impact 1-1: Mitigation Measures	4.1-102
	4.1.0	4.1.8.8 Impact 1-1: Level of Significance After Mitigation	4.1-103
	4.1.9	References	4.1-104
4.2	Forestry		4.2-1
		Introduction to Forestry	4.2-1
	4.2.2		4.2-1
		4.2.2.1 Federal Regulations and Policies	4.2-1
		4.2.2.2 State Regulations and Policies	4.2-2
		3 Timberland Production Zoning (TPZ)	4.2-4
	4.2.3	System-Wide Setting	4.2-5
		4.2.3.1 Forest Management	4.2-5
	4.2.4	Regional and Local Setting and Regulatory Context	4.2-10
		4.2.4.1 Shasta Regional Bundle	4.2-10
		4.2.4.2 DeSabla Regional Bundle	4.2-15
		4.2.4.3 Drum Regional Bundle	4.2-20
		4.2.4.4 Motherlode Region Bundle	4.2-24
	495	4.2.4.5 Kings Crane-Helms Regional Bundle	4.2-28 4.2-32
	$4.2.5 \\ 4.2.6$	Standards of Significance Analytical Methods	4.2-32
	4.2.0		4.2-32
		4.2.6.1 Timber Inventory and Productivity 4.2.6.2 Reforestation	4.2-32
		4.2.6.3 Timber Trespass	4.2-33
		4.2.6.4 Carbon Cycling	4.2-34
	4.2.7	Introduction to Impacts and Mitigation Measures	4.2-34
	1.6.1	4.2.7.1 Shasta Regional Bundle	4.2-35
		4.2.7.2 DeSabla Regional Bundle	4.2-36

		4.2.7.3 Drum Regional Bundle	4.2-37
		4.2.7.4 Motherlode Regional Bundle	4.2-37
		4.2.7.5 Kings Crane-Helms Regional Bundle	4.2-38
	4.2.8	ě č	4.2-39
	1.2.0	4.2.8.1 Impact 2-1: Shasta Regional Bundle	4.2-39
		4.2.8.2 Impact 2-1: DeSabla Regional Bundle	4.2-39
		4.2.8.3 Impact 2-1: Drum Regional Bundle	4.2-40
		4.2.8.4 Impact 2-1: Motherlode Regional Bundle	4.2-41
		4.2.8.5 Impact 2-1: Kings Crane-Helms Regional Bundle	4.2-41
		4.2.8.6 Impact 2-1: Evaluation of Impact to Entire System	4.2-42
	4.2.9	- · · · · · · · · · · · · · · · · · · ·	4.2-42
	1.2.0	4.2.9.1 Impact 2-2: Shasta Regional Bundle	4.2-42
		4.2.9.2 Impact 2-2: DeSabla Regional Bundle	4.2-43
		4.2.9.3 Impact 2-2: Drum Regional Bundle	4.2-44
		4.2.9.4 Impact 2-2: Motherlode Regional Bundle	4.2-44
		4.2.9.5 Impact 2-2: Kings Crane-Helms Region	4.2-45
		4.2.9.6 Impact 2-2: Evaluation of Impact to Entire System	4.2-45
	4.2.10	References	4.2-46
4.3	Hydrolog	gy and Water Quality	4.3-1
1.0	4.3.1	• • •	4.3-1
	1.0.1	4.3.1.1 Water Use	4.3-1
		4.3.1.2 Sources of Water Resources Impacts at	1.0 1
		Hydroelectric Facilities	4.3-2
		4.3.1.3 Water Management	4.3-3
	4.3.2	System-Wide Regulatory Context	4.3-7
		4.3.2.1 FERC Regulation	4.3-7
		4.3.2.2 Non-FERC Regulation of Water Resources	4.3-8
		4.3.2.3 Informal Practices	4.3-20
	4.3.3	System-Wide Setting	4.3-21
		4.3.3.1 System-Wide Water Quality Conditions	4.3-21
		4.3.3.2 Known Flooding Conditions	4.3-23
		4.3.3.3 Known Geomorphic Problems	4.3-23
	4.3.4	Regional and Local Setting and Regulatory Context	4.3-23
		4.3.4.1 Shasta Regional Bundle	4.3-24
		4.3.4.2 DeSabla Regional Bundle	4.3-49
		4.3.4.3 Drum Regional Bundle	4.3-75
		4.3.4.4 Motherlode Regional Bundle	4.3-101
		4.3.4.5 Kings Crane-Helms Regional Bundle	4.3-124
	4.3.5	Standards of Significance	4.3-155
	4.3.6	Analytical Methods	4.3-155
	4.3.7	Introduction to Impacts and Mitigation Measures	4.3-157
	4.3.8	Impact 3-1: Impact, Analysis, and Mitigation Measures	4.3-157
		4.3.8.1 Impact 3-1: Shasta Regional Bundle	4.3-158
		4.3.8.2 Impact 3-1: DeSabla Regional Bundle	4.3-159
		4.3.8.3 Impact 3-1: Drum Regional Bundle	4.3-161
		4.3.8.4 Impact 3-1: Motherlode Regional Bundle	4.3-162
		4.3.8.5 Impact 3-1: Kings Crane-Helms Regional Bundle	4.3-164

	4.3.8.6	Evaluation of Impact 3-1 to Entire System	4.3-166
	4.3.8.7	Impact 3-1: Mitigation Measures	4.3-166
	4.3.8.8	Impact 3-1: Level of Significance after Mitigation	4.3-166
4.3.9	Impact 3	-2: Impact, Analysis, and Mitigation Measures	4.3-166
	4.3.9.1	Impact 3-2: Evaluation of Impact to Shasta Bundle	4.3-167
	4.3.9.2	Impact 3-2: Evaluation of Impact to DeSabla Bundle	4.3-168
	4.3.9.3	Impact 3-2: Evaluation of Impact to Drum Bundle	4.3-169
	4.3.9.4	Impact 3-2: Evaluation of Impact to Motherlode Bundle	4.3-169
	4.3.9.5	Impact 3-2: Evaluation of Impact to Kings	
		Crane-Helms Bundle	4.3-170
	4.3.9.6	Evaluation of Impact 3-2 to Entire System	4.3-171
	4.3.9.7	Impact 3-2: Mitigation Measures	4.3-171
4.3.10	Impact 3	-3: Impact, Analysis, and Mitigation Measures	4.3-171
	4.3.10.1	Impact 3-3: Motherlode and DeSabla Regional Bundles	4.3-171
	4.3.10.2	Impact 3-3: Mitigation Measures	4.3-172
	4.3.10.3	Impact 3-3: Level of Significance after Mitigation	4.3-172
4.3.11	Impact 3	-4: Impact, Analysis, and mitigation Measures	4.3-172
	4.3.11.1	Impact 3-4: Evaluation of Impact to Entire System	4.3-172
	4.3.11.2	Impact 3-4: Mitigation Measures	4.3-174
	4.3.11.3	Impact 3-4: Level of Significance After Mitigation	4.3-174
4.3.12	Impact 3-	5: Impact, Analysis, and Mitigation Measures	4.3-174
	4.3.12.1	Impact 3-5: Evaluation of Impact to Shasta Bundle	4.3-175
	4.3.12.2	Impact 3-5: Evaluation of Impact to DeSabla	
		Regional Bundle	4.3-175
	4.3.12.3	Impact 3-5: Evaluation of Impact to Drum Bundle	4.3-176
	4.3.12.4	Impact 3-5: Evaluation of Impact to Motherlode	
		Regional Bundle	4.3-176
	4.3.12.5	Impact 3-5: Evaluation of Impact to Kings	
		Crane-Helms Regional Bundle	4.3-179
	4.3.12.6	Impact 3-5: Evaluation of Impact to Entire System	4.3-181
	4.3.12.7	Impact 3-5: Mitigation Measures	4.3-181
	4.3.12.8	Impact 3-5:Level of Significance After Mitigation	4.3-182
4.3.13	Impact 3	-6: Impact, Analysis, and Mitigation Measures	4.3-182
	4.3.13.1	Impact 3-6: Shasta Regional Bundle	4.3-182
	4.3.13.2	Impact 3-6: DeSabla Regional Bundle	4.3-183
	4.3.13.3	Impact 3-6: Drum Regional Bundle	4.3-183
	4.3.13.4	Impact 3-6: Motherlode Regional Bundle	4.3-184
		Impact 3-6: Kings Crane-Helms Regional Bundle	4.3-184
	4.3.13.6	Impact 3-6: Mitigation Measures	4.3-185
	4.3.13.7	Impact 3-6: Level of Significance After Mitigation	4.3-185
4.3.14	Impact 3	-7: Impact, Analysis, and Mitigation Measures	4.3-185
	4.3.14.1	Impact 3-7: Shasta Regional Bundle	4.3-186
	4.3.14.2	Impact 3-7: DeSabla Regional Bundle	4.3-186
		Impact 3-7: Drum Regional Bundle	4.3-187
		Impact 3-7: Motherlode Regional Bundle	4.3-187
		Impact 3-7: Kings Crane-Helms Regional Bundle	4.3-187
		Impact 3-7: Mitigation Measures	4.3-187
		Impact 3-7: Level of Significance After Mitigation	4 3-188

4.0.15		4.0.100
4.3.15	5 Impact 3-8: Impact, Analysis, and Mitigation Measures	4.3-188
	4.3.15.1 Impact 3-8: Evaluation of Impact to Entire System	4.3-188
	4.3.15.2 Impact 3-8: Mitigation Measures	4.3-189
	4.3.15.3 Impact 3-8: Level of Significance After Mitigation	4.3-190
4.3.16	3 Impact 3-9: Impacts, Analysis, and Mitigation Measures	4.3-190
	4.3.16.1 Impact 3-9: Evaluation of Impact to Entire System	4.3-190
	4.3.16.2 Impact 3-9: Mitigation Measures	4.3-192
	4.3.16.3 Impact 3-9: Level of Significance After Mitigation	4.3-193
4.3.17	Impact 3-10: Impacts, Analysis, and Mitigation Measures	4.3-193
	4.3.17.1 Impact 3-10: Evaluation of Impact to Entire System	4.3-193
	4.3.17.2 Impact 3-10: Mitigation Measures	4.3-195
	4.3.17.3 Impact 3-10: Level of Significance After Mitigation	4.3 - 195
4.3.18	3 References	4.3-196
	VOLUME 3	
4.4 Fisherie	s and Aquatic Biology	4.4-1
4.4.1	Introduction to Fisheries and Aquatic Biology	4.4-1
4.4.2	System-Wide Regulatory Context	4.4-2
	4.4.2.1 Federal Regulations and Policies	4.4-11
	4.4.2.2 State Regulations and Policies	4.4-14
	4.4.2.3 Regional Regulations and Policies	4.4-18
4.4.3		4.4-19
	4.4.3.1 Northwestern California	4.4-19
	4.4.3.2 Cascade Range	4.4-19
	4.4.3.3 Sierra Nevada	4.4-19
4.4.4	Regional and Local Setting and Regulatory Context	4.4-19
	4.4.4.1 Shasta Regional Bundle	4.4-19
	4.4.4.2 DeSabla Regional Bundle	4.4-72
	4.4.4.3 Drum Regional Bundle	4.4-114
	4.4.4.4 Motherlode Regional Bundle	4.4-147
	4.4.4.5 Kings Crane-Helms Regional Bundle	4.4-178
4.4.5	Standards of Significance	4.4-212
4.4.6	Analytical Methods	4.4-212
	4.4.6.1 Introduction	4.4-212
	4.4.6.2 Analysis Approach	4.4-212
	4.4.6.3 Analysis Methodology – Storage Reservoirs	4.4-214
	4.4.6.4 Analysis Methodology - Streams	4.4-233
	4.4.6.5 Analysis Methodology for Water Temperature –	
	Reservoirs and Streams	4.4-234
4.4.7	Introduction to Impacts and Mitigation Measures	4.4 - 235
4.4.8	Impact 4-1: Impact, Analysis, and Mitigation Measures	4.4 - 236
	4.4.8.1. Impact 4-1: Shasta Regional Bundle	4.4 - 236
	4.4.8.2 DeSabla Regional Bundle	4.4-240
	4.4.8.3 Drum Regional Bundle	4.4-248
	4.4.8.4 Motherlode Regional Bundle	4.4-262
	4.4.8.5 Kings Crane-Helms Regional Bundle	4.4-273
	4.4.8.6 Evaluation of Impact 4-1 Entire System	4.4-278

		4.4.8.7 Impact 4-1: Mitigation Measures	4.4-278
		4.4.8.8 Impact 4-1: Level of Significance After Mitigation	4.4-291
	4.4.9	Impact 4-2: Impact and Analysis	4.4-291
		4.4.9.1 Impact 4-2: Shasta Regional Bundle	4.4 - 291
		4.4.9.2 Impact 4-2 DeSabla Regional Bundle	4.4 - 297
		4.4.9.3 Impact 4-2: Drum Regional Bundle	4.4-304
		4.4.9.4 Impact 4-2: Motherlode Regional Bundle	4.4-309
		4.4.9.5 Impact 4-2: Kings Crane-Helms Regional Bundle	4.4-314
		4.4.9.6 Evaluation of Impact 4-2 to Entire System	4.4-316
		4.4.9.7 Impact 4-2: Mitigation Measures	4.4-318
		4.4.9.8 Impact 4-2: Level of Significance After Mitigation	4.4-324
	4.4.10	References	4.4-325
		VOLUME 4	
4.5 To	errestria	al Biology	4.5-1
		Introduction to Terrestrial Biology	4.5-1
	4.5.2	80	4.5-2
		4.5.2.1 Regulatory Agencies	4.5-2
		4.5.2.2 Federal Regulations and Policies	4.5-3
		4.5.2.3 State Regulations and Policies	4.5-7
		4.5.2.4 Regional Regulations and Policies	4.5-12
	4.5.3	System-Wide Setting	4.5-12
		4.5.3.1 Northwestern California	4.5-12
		4.5.3.2 Cascade Range	4.5-12
		4.5.3.3 Sierra Nevada	4.5-13
		4.5.3.4 Habitat Community Descriptions	4.5-13
	4.5.4	Regional and Local Setting and Regulatory Context	4.5-24
		4.5.4.1 Shasta Regional Bundle	4.5-24
		4.5.4.2 DeSabla Regional Bundle	4.5-97
		4.5.4.3 Drum Regional Bundle	4.5-164
		4.5.4.4 Motherlode Regional Bundle	4.5-215
		4.5.4.5 Kings Crane–Helms Regional Bundle	4.5-266
	4.5.5	Standards of Significance	4.5-324
	4.5.6	Analytical Methods	4.5-324
		4.5.6.1 Establishing the Environmental Baseline	4.5-324
	1 5 7	4.5.6.2 Project Impact Analysis	4.5-326
	4.5.7	Introduction to Impacts and Mitigation Measures	4.5-327
	4.5.8.		4.5-327
		1	4.5-327 4.5-344
		4.5.8.2 DeSabla Regional Bundle4.5.8.3 Drum Regional Bundle	4.5-358
		4.5.8.4 Motherlode Regional Bundle	4.5-373
		4.5.8.5 Kings Crane-Helms Regional Bundle	4.5-385
		4.5.8.6 Evaluation of Impact to Entire System	4.5-399
		4.5.8.7 Impact 5-1: Mitigation Measures	4.5-399
		4.5.8.8 Impact 5-1: Level of Significance After Mitigation	4.5-401
	4.5.9	Impact 5-2: Impact, Analysis, and Mitigation Measures	4.5-401

	4.5.9.1 Shasta Regional Bundle	4.5-402
	4.5.9.2 DeSabla Regional Bundle	4.5-420
	4.5.9.3 Drum Regional Bundle	4.5-442
	4.5.9.4 Motherlode Regional Bundle	4.5-460
	4.5.9.5 Kings Crane-Helms Regional Bundle	4.5-473
	4.5.9.6 Evaluation of Impact to Entire System	4.5-488
	4.5.9.7 Impact 5-2: Mitigation Measures	4.5-489
	4.5.9.8 Impact 5-2: Level of Significance After Mitigation	4.5-491
4.5.10	Impact 5-3: Impact, Analysis and Mitigation Measures	4.5-491
	4.5.10.1 Shasta Regional Bundle	4.5-492
	4.5.10.2 DeSabla Regional Bundle	4.5-498
	4.5.10.3 Drum Regional Bundle	4.5-505
	4.5.10.4 Motherlode Regional Bundle	4.5-513
	4.5.10.5 Kings Crane-Helms Regional Bundle	4.5-517
	4.5.10.6 Evaluation of Impact to Entire System	4.5-523
	4.5.10.7 Impact 5-3: Mitigation Measures	4.5-523
	4.5.10.8 Impact 5-3: Level of Significance After Mitigation	4.5-525
4.5.11	Impact 5-4: Impact, Analysis, and Mitigation Measures	4.5-525
	4.5.11.1 Shasta Regional Bundle	4.5-527
	4.5.11.2 DeSabla Regional Bundle	4.5-528
	4.5.11.3 Drum Regional Bundle	4.5-528
	4.5.11.4 Motherlode Regional Bundle	4.5-529
	4.5.11.5 Kings Crane-Helms Regional Bundle	4.5-530
	4.5.11.6 Evaluation of Impact to Entire System	4.5-530
	4.5.11.7 Impact 5-4: Mitigation Measures	4.5-530
	4.5.11.8 Impact 5-4: Level of Significance After Mitigation	4.5-531
4.5.12	Impact 5-5: Impact, Analysis, and Mitigation measures	4.5-532
	4.5.12.1 Shasta Regional Bundle	4.5-535
	4.5.12.2 DeSabla Regional Bundle	4.5 - 536
	4.5.12.3 Drum Regional Bundle	4.5-539
	4.5.12.4 Motherlode Regional Bundle	4.5-541
	4.5.12.5 Kings Crane-Helms Regional Bundle	4.5-543
	4.5.12.6 Evaluation of Impact to Entire System	4.5-544
	4.5.12.7 Impact 5-5: Mitigation Measures	4.5-545
	4.5.12.8 Impact 5-5 Level of Significance After Mitigation	4.5-545
4.5.13	References	4.5-545
	VOLUME 5	
Recreation	on	4.6-1
4.6.1	Introduction to Recreation	4.6-1
4.6.2	System-Wide Regulatory Context	4.6-1
	4.6.2.1 Federal Regulations and Policies	4.6-3
	4.6.2.2 State Regulations and Policies	4.6-3
4.6.3	System-Wide Setting	4.6-4
4.6.4	Regional and Local Setting and Regulatory Context	4.6-4
	4.6.4.1 Shasta Regional Bundle	4.6-4
	4.6.4.2 DeSabla Regional Bundle	4.6-29

4.6

		4.6.4.3 Drum Regional Bundle	4.6-54
		4.6.4.4 Motherlode Regional Bundle	4.6-89
		4.6.4.5 Kings Crane-Helms Regional Bundle	4.6-126
	4.6.5	ě č	4.6-169
	4.6.6	8	4.6-170
		4.6.6.1 General Approach and Assumptions	4.6-170
		4.6.6.2 Methods for Evaluating Impacts on Water-Based	
		Recreational Opportunities and Facilities	4.6-171
	4.6.7	Introduction to Impacts and Mitigation Measures	4.6-187
	4.6.8	Impact 6-1: Impacts, Analysis, and Mitigation Measures	4.6-187
		4.6.8.1 Impact 6-1: Shasta Regional Bundle	4.6-188
		4.6.8.2 Impact 6-1: DeSabla Regional Bundle	4.6-196
		4.6.8.3 Impact 6-1: Drum Regional Bundle	4.6-203
		4.6.8.4 Impact 6-1: Motherlode Regional Bundle	4.6-221
		4.6.8.5 Impact 6-1: Kings Crane-Helms Regional Bundle	4.6-244
		4.6.8.6 Evaluation of Impact 6-1 to Entire System	4.6 - 256
		4.6.8.7 Impact 6-1: Mitigation Measures	4.6-256
		4.6.8.8 Impact 6-1: Level of Significance After Mitigation	4.6-263
	4.6.9	Impact 6-2: Impact, Analysis, and Mitigation Measures	4.6-263
		4.6.9.1 Impact 6-2: Shasta Regional Bundle	4.6-263
		4.6.9.2 Impact 6-2: DeSabla Regional Bundle	4.6-271
		4.6.9.3 Impact 6-2: Drum Regional Bundle	4.6-279
		4.6.9.4 Impact 6-2: Motherlode Regional Bundle	4.6-286
		4.6.9.5 Impact 6-2: Kings Crane-Helms Regional Bundle	4.6-295
		4.6.9.6 Evaluation of Impact 6-2 to Entire System	4.6-301
		4.6.9.7 Impact 6-2: Mitigation Measures	4.6-301
		4.6.9.8 Level of Significance After Mitigation	4.6-305
	4.6.10	Impact 6-3: Impact, Analysis, and Mitigation Measures	4.6 - 305
		4.6.10.1 Impact 6-3: Shasta Regional Bundle	4.6-305
		4.6.10.2 Impact 6-3: DeSabla Regional Bundle	4.6-308
		4.6.10.3 Impact 6-3: Drum Regional Bundle	4.6-310
		4.6.10.4 Impact 6-3: Motherlode Regional Bundle	4.6-314
		4.6.10.5 Impact 6-3: Kings Crane-Helms Regional Bundle	4.6-317
		4.6.10.6 Evaluation of Impact 6-3 to Entire System	4.6-321
		4.6.10.7 Impact 6-3: Mitigation Measures	4.6-321
		4.6.10.8 Level of Significance After Mitigation	4.6-321
	4.6.11	References	4.6-322
4.7	Cultural	Resources	4.7-1
	4.7.1	Introduction to Cultural Resources	4.7-1
	4.7.2	System-Wide Regulatory Context	4.7-2
		4.7.2.1 Federal Regulations and Policies	4.7-2
		4.7.2.2 State Regulations and Policies	4.7-5
	4.7.3	System-Wide Setting	4.7-6
		4.7.3.1 Paleontological Resources	4.7-6
		4.7.3.2 Archaeological Resources	4.7-7
		4.7.3.3 Historical Resources	4.7-7
		4.7.3.4 Ethnographic Resources	4.7-8

	4.7.4	Regional and Local Setting and Regulatory Context	4.7-19
		4.7.4.1 Shasta Regional Bundle	4.7-19
		4.7.4.2 DeSabla Regional Bundle	4.7-27
		4.7.4.3 Drum Regional Bundle	4.7-36
		4.7.4.4 Motherlode Regional Bundle	4.7-41
		4.7.4.5 Kings Crane-Helms Regional Bundle	4.7-51
	4.7.5	Standards of Significance	4.7-67
		4.7.5.1 Historical and Archaeological Resources	4.7-67
		4.7.5.2 Native American Ethnic and Cultural Values	4.7-67
	4.7.6	Analytical Methods	4.7-67
		4.7.6.1 Definitions of Cultural Resources	4.7-67
		4.7.6.2 Cultural Resources and CEQA	4.7-68
		4.7.6.3 Determination of a Historical Resource Under CEQA	4.7-68
		4.7.6.4 Native American Concerns	4.7-70
		4.7.6.5 Assumptions Regarding the Scenarios Under Analysis	4.7-72
	4.7.7	Introduction to Impacts and Mitigation Measures	4.7-75
	4.7.8	Impact 7-1: Impact, Analysis, and Mitigation Measures	4.7-75
		4.7.8.1 Impact 7-1: Shasta Regional Bundle	4.7-75
		4.7.8.2 Impact 7-1: DeSabla Regional Bundle	4.7-77
		4.7.8.3 Impact 7-1: Drum Regional Bundle	4.7-78
		4.7.8.4 Impact 7-1: Motherlode Regional Bundle	4.7-79
		4.7.8.5 Impact 7-1: Kings Crane-Helms Regional Bundle	4.7-81
		4.7.8.6 Evaluation of Impact 7-1 to Entire System	4.7-83
		4.7.8.7 Impact 7-1: Mitigation Measures	4.7-85
		4.7.8.8 Impact 7-1: Level of Significance After Mitigation	4.7-85
	4.7.9	Impact 7-2: Impact, Analysis, and Mitigation Measures	4.7-85
		4.7.9.1 Impact 7-2: Shasta Regional Bundle	4.7-85
		4.7.9.2 Impact 7-2: DeSabla Regional Bundle	4.7-86
		4.7.9.3 Impact 7-2: Drum Regional Bundle	4.7-88
		4.7.9.4 Impact 7-2: Motherlode Regional Bundle	4.7-89
		4.7.9.5 Impact 7-2: Kings Crane-Helms Regional Bundle	4.7-90
		4.7.9.6 Evaluation of Impact 7-2 to Entire System	4.7-91
		4.7.9.7 Impact 7-2: Mitigation Measures	4.7-91
	4710	4.7.9.8 Impact 7-2: Level of Significance After Mitigation	4.7-92
	4.7.10	Impact 7-3: Impact, Analysis, and Mitigation Measures	4.7-92
		4.7.10.1 Impact 7-3: Shasta Regional Bundle	4.7-92
		4.7.10.2 Impact 7.3: DeSabla Regional Bundle	4.7-93
		4.7.10.3 Impact 7.3: Drum Regional Bundle	4.7-95
		4.7.10.4 Impact 7-3: Motherlode Regional Bundle	4.7-97
		4.7.10.5 Impact 7-3: Kings Crane-Helms Regional Bundle	4.7-99
		4.7.10.6 Evaluation of Impact 7-3 to Entire System	4.7-99
		4.7.10.7 Impact 7.3: Mitigation Measures	4.7-100
	4711	4.7.10.8 Impact 7-3: Level of Significance After Mitigation	4.7-101
	4.7.11	References	4.7-102
4.8	Agricultu		4.8-1
	4.8.1	Introduction to Agricultural Resources	4.8-1
	4.8.2	System-Wide Regulatory Context	4.8-1

	4.8.2.1 Federal Regulations and Policies	4.8-1
	4.8.2.2 State Regulations and Policies	4.8-3
	4.8.2.3 Regional Regulations and Policies	4.8-5
4.8.3	System-Wide Settings	4.8-5
	4.8.3.1 Agricultural Land	4.8-5
	4.8.3.2 Agricultural Water	4.8-6
4.8.4	Regional and Local Settings and Regulatory Context	4.8-7
	4.8.4.1 Shasta Regional Bundle	4.8-8
	4.8.4.2 DeSabla Regional Bundle	4.8-14
	4.8.4.3 Drum Regional Bundle	4.8-23
	4.8.4.4 Motherlode Regional Bundle	4.8-30
	4.8.4.5 Kings Crane-Helms Regional Bundle	4.8-34
4.8.5	Standards of Significance	4.8.39
4.8.6	Analytical Methods	4.8-39
4.8.7	Introduction to Impacts and Mitigation Measures	4.8-45
4.8.8	Impact 8-1: Impact, Analysis, and Mitigation Measures	4.8-45
	4.8.8.1 Evaluation of Impact 8-1 to Entire System	4.8.45
	4.8.8.2 Impact 8-1: Mitigation Measures	4.8-46
4.8.9	Impact 8-2: Impact, Analysis, and Mitigation Measures	4.8-46
	4.8.9.1 Impact 8-2: Shasta Regional Bundle	4.8-46
	4.8.9.2 Impact 8-2: DeSabla Regional Bundle	4.8-46
	4.8.9.3 Impact 8-2: Drum Regional Bundle	4.8-46
	4.8.9.4 Impact 8-2: Motherlode Regional Bundle	4.8-47
	4.8.9.5 Impact 8.2: Kings Crane-Helms Regional Bundle	4.8-48
	4.8.9.6 Impact 8-2: Evaluation of Impact to Entire System	4.8-48 4.8-48
	4.8.9.7 Impact 8-2: Mitigation Measures4.8.9.8 Impact 8-2: Level of Significance After Mitigation	4.8-48
1 8 10	Impact 8-3: Impact, Analysis, and Mitigation Measures	4.8-48
4.0.10	4.8.10.1 Impact 8-3: Shasta Regional Bundle	4.8-49
	4.8.10.2 Impact 8-3: DeSabla Regional Bundle	4.8-49
	4.8.10.3 Impact 8-3: Drum Regional Bundle	4.8-49
	4.8.10.4 Impact 8-3: Motherlode Regional Bundle	4.8-50
	4.8.10.5 Impact 8-3: Kings Crane-Helms Regional Bundle	4.8-51
	4.8.10.6 Impact 8-3: Mitigation Measures	4.8-51
	4.8.10.7 Impact 8-3: Level of Significance After Mitigation	4.8-51
4.8.11	References	4.8-52
	VOLUME 6	
Hazards	and Hazardous Materials	4.9-1
4.9.1	Introduction to Hazards and Hazardous Materials	4.9-1
	4.9.1.1 FERC Licensed Lands	4.9-1
	4.9.1.2 Watershed Lands	4.9-1
4.9.2	System-Wide Regulatory Context	4.9-2
	4.9.2.1 Federal and State Regulations and Policies	4.9-2
	4.9.2.2 Regional Regulations and Policies	4.9-2
4.9.3	y O	4.9-2
	4.9.3.1 Facility/Dam Safety	4.9-8

4.9

	4.9.3.2	Public Safety	4.9-11
		Worker Safety	4.9-13
	4.9.3.4	Hazardous Materials and Waste	4.9-14
	4.9.3.5	Fire Safety and Explosive Materials	4.9-16
	4.9.3.6	Potential Site Contamination	4.9-18
	4.9.3.7	Environmental Assessments of Associated Watershed Lands	4.9 - 22
	4.9.3.8	Abandoned Mine Lands	4.9-23
	4.9.3.9	Natural Hazards Associated with Project Lands	4.9-24
4.9.4	Regional	and Local Setting and Regulatory Context	4.9 - 25
	4.9.4.1	Shasta Regional Bundle	4.9 - 25
	4.9.4.2	DeSabla Regional Bundle	4.9-44
	4.9.4.3	U	4.9-74
	4.9.4.4	Motherlode Regional Bundle	4.9 - 94
	4.9.4.5	Kings Crane-Helms Regional Bundle	4.9-111
		s of Significance	4.9-134
4.9.6	Analytica	al Methods	4.9-134
	4.9.6.1	Hazardous Materials	4.9-134
	4.9.6.2	Hazardous Waste	4.9 - 135
		Hazard vs. Risk	4.9-136
	4.9.6.4	Worker and Public Safety	4.9-137
	4.9.6.5	Project Analysis	4.9-137
		tion to Impacts and Mitigation Measures	4.9-138
4.9.8.	Impact 9	-1: Impact, Analysis, and Mitigation Measures	4.9-139
		Impact 9-1: Shasta Regional Bundle	4.9-140
	4.9.8.2	1	4.9-140
	4.9.8.3	Impact 9-1: Drum Regional Bundle	4.9-143
	4.9.8.4	1	4.9-145
	4.9.8.5	Impact 9-1: Kings Crane-Helms Regional Bundle	4.9-146
	4.9.8.6	Evaluation of Impact 9-1 to Entire System	4.9-147
	4.9.8.7	Impact 9-1 Mitigation Measures	4.9-147
	4.9.8.8	0	4.9-148
4.9.9	-	-2: Impact, Analysis and Mitigation Measures	4.9-148
	4.9.9.1	Impact 9-2: Shasta Regional Bundle	4.9-149
		Impact 9-2: DeSabla Regional Bundle	4.9-149
	4.9.9.3.	Impact 9-2: Drum Regional Bundle	4.9-149
	4.9.9.4		4.9-149
	4.9.9.5	1 0	4.9-150
	4.9.9.6	Impact 9-2: Evaluation of Impact 9-2 to Entire System	4.9-150
	4.9.9.7	Impact 9-2: Mitigation Measures	4.9 - 150
	4.9.9.8	0	4.9-150
4.9.10	-	-3: Impact, Analysis, and Mitigation Measures	4.9-151
		Evaluation of Impact 9-3 to Entire System	4.9-151
		Impact 9-3: Mitigation Measures	4.9-152
		Impact 9-3: Level of Significance After Mitigation	4.9-152
4.9.11	-	-4: Impact, Analysis and Mitigation Measures	4.9-152
		Evaluation of Impact 9-4 to Entire System	4.9-152
		Impact 9-4: Mitigation Measures	4.9-157
	4.9.11.3	Impact 9-4: Level of Significance After Mitigation	4.9 - 158

4.9.12	Impact 9-5: Impact, Analysis, and Mitigation Measures	4.9-158
	4.9.12.1 Evaluation of Impact 9-5 to Entire System	4.9-158
	4.9.12.2 Impact 9-5: Mitigation Measures	4.9-160
	4.9.12.3 Impact 9-5: Level of Significance After Mitigation	4.9-161
4.9.13	References	4.9-161
4.10 Population	on, Employment, and Housing	4.10-1
4.10.1	Introduction to Population, Employment, and Housing Resources	4.10-1
	System-Wide Regulatory Context	4.10-1
4.10.3	System-Wide Setting	4.10-1
	4.10.3.1 Population	4.10-1
	4.10.3.2 Pacific Gas and Electric Company Employment	4.10-1
4.10.4	Regional and Local Setting and Regulatory Context	4.10-3
	4.10.4.1 Shasta Regional Bundle	4.10-3
	4.10.4.2 DeSabla Regional Bundle	4.10-5
	4.10.4.3 Drum Regional Bundle	4.10-8
	4.10.4.4 Motherlode Regional Bundle	4.10-10
	4.10.4.5 Kings Crane-Helms Regional Bundle	4.10-13
4.10.5	Standards of Significance	4.10-15
4.10.6	Analytical Methods	4.10-16
4.10.7	Introduction to Impacts and Mitigation Measures	4.10-16
4.10.8	Impact 10-1: Impact, Analysis, and Mitigation Measures	4.10-16
	4.10.8.1 Shasta Regional Bundle	4.10-16
	4.10.8.2 DeSabla Regional Bundle	4.10-18
	4.10.8.3 Drum Regional Bundle	4.10-19
	4.10.8.4 Motherlode Regional Bundle	4.10-20
	4.10.8.5 Kings Crane-Helms Regional Bundle	4.10-21
	4.10.8.6 Evaluation of Impact 10-1 to Entire System	4.10-22
4.10.9	References	4.10-22
4.11 Public Se	ervices and Utilities	4.11-1
4.11A	Energy	4.11-1
	4.11A.1 Introduction	4.11-1
	4.11A.2 System-Wide Regulatory Context	4.11-1
	4.11A.2.1 Managing System Reliability	4.11-1
	4.11A.2.2 Must Run Contracts and Area Reliability	4.11-2
	4.11A.3 System-Wide Setting	4.11-5
	4.11A.4 Regional and Local Setting	4.11-7
	4.11A.5 Standards of Significance	4.11-7
	4.11A.6 Analytical Methods	4.11-8
	4.11A.7 Introduction to Impacts and Mitigation Measures	4.11-9
	4.11A.8 Impact 11-1: Impact, Analysis, and Mitigation Measures	4.11-9
	4.11A.8.1 Impact 11-1: Mitigation Measures	4.11-9
	4.11A.8.2 Level of Significance After Mitigation	4.11-10
	4.11A.9 Impact 11-2: Impact, Analysis, and Mitigation Measures	4.11-10
	4.11A.9.1 Impact 11-2: Mitigation Measures	4.11-10
4.11B	Water Supply	4.11-11
	4.11B.1 Introduction	4.11-11

	4.11B.2	System-Wide	Regulatory Context	4.11-11
		4.11B.2.1	State Regulations and Policies	4.11-11
	4.11B.3	System-Wide	S .	4.11-12
	4.11B.4	Regional and	Local Setting	4.11-13
		4.11B.4.1	Shasta Regional Bundle	4.11-14
		4.11B.4.2	DeSabla Regional Bundle	4.11-16
		4.11B.4.3	Drum Regional Bundle	4.11-18
		4.11B.4.4	Motherlode Regional Bundle	4.11-23
		4.11B.4.5	Kings Crane-Helms Regional Bundle	4.11-25
	4.11B.5	Standards of	Significance	4.11-26
	4.11B.6	Analytical M	ethods	4.11-26
	4.11B.7	Introduction (to Impacts and Mitigation Measures	4.11-27
			Impact, Analysis, and Mitigation Measures	4.11-28
		4.11B.8.1	Impact to Entire Shasta Regional Bundle	4.11-28
		4.11B.8.2	Impact to Entire DeSabla Regional Bundle	4.11-28
		4.11B.8.3	Impact to the Entire Drum Regional Bundle	4.11-28
		4.11B.8.4	Impact to Entire Motherlode	
			Regional Bundle	4.11-29
		4.11B.8.5	Impact to Entire Kings Crane-Helms	
			Regional Bundle	4.11-29
		4.11B.8.6	Evaluation of Impact to Entire System	4.11-30
		4.11B.8.7	Impact 11-3: Mitigation Measures	4.11-30
		4.11B.8.8	Level of Significance after Mitigation	4.11-30
	4.11B.9	Impact 11-4:	Impact, Analysis, and Mitigation Measures	4.11-30
		4.11B.9.1	Shasta Regional Bundle	4.11-33
		4.11B.9.2	DeSabla Regional Bundle	4.11-34
		4.11B.9.3	Drum Regional Bundle	4.11-34
		4.11B.9.4	Motherlode Regional Bundle	4.11-37
		4.11B.9.5	Kings Crane-Helms Regional Bundle	4.11-38
		4.11B.9.6	Evaluation of Impact 11-4 to Entire System	4.11-38
		4.11B.9.7	Impact 11-4: Mitigation Measures	4.11-38
		4.11B.9.8	Level of Significance After Mitigation	4.11-38
4.11C	Other Pu	blic Services a	and Utilities	4.11-39
	4.11C.1	Introduction	to Other Public Services and	
		Utilities R	esources	4-11-39
	4.11C.2	System-Wide	Regulatory Context	4.11-39
		4.11C.2.1	State Regulations and Policies	4.11-39
	4.11C.3	System-Wide		4.11-42
		4.11C.3.1	Utilities	4.11-42
		4.11C.3.2	Public Services	4.11-43
		4.11C.3.3	Taxation	4.11-47
	4.11C.4	Regional and	Local Setting	4.11-51
		4.11C.4.1	Shasta Regional Bundle	4.11-51
		4.11C.4.2	DeSabla Regional Bundle	4.11-55
		4.11C.4.3	Drum Regional Bundle	4.11-61
		4.11C.4.4	Motherlode Regional Bundle	4.11-65
		4.11C.4.5	Kings Crane-Helms Regional Bundle	4.11-68
	4.11C.5	Standards of		4.11-71

	4.11C.6	Analytical M	Iethods	4.11-71
		•	to Impacts and Mitigation Measures	4.11-74
			Impact, Analysis, and Mitigation Measures	4.11-74
		4.11C.8.1	Impact 11-5: Entire Shasta Regional Bundle	4.11-74
		4.11C.8.2	Impact 11-5: Entire DeSabla Regional	
			Bundle	4.11-77
		4.11C.8.3	Impact 11-5: Entire Drum Regional Bundle	4.11-79
		4.11C.8.4	Impact 11-5: Entire Motherlode	
			Regional Bundle	4.11-82
		4.11C.8.5	Impact 11-5: Entire Kings Crane-Helms	
			Regional Bundle	4.11-85
		4.11C.8.6	Evaluation of Impact 11-5 to Entire System	4.11-87
		4.11C.8.7	Mitigation Measures	4.11-89
		4.11C.8.8	Mitigation Measures Identified	
			in This Report	4.11-89
		4.11C.8.9	Impact 11-5: Level of Significance	
			After Mitigation	4.11-91
4.11D	Telecom	munications		4.11-91
	4.11D.1	Introduction		4.11-91
	4.11D.2	System-Wide	e Regulatory Context	4.11-91
		4.11D.2.1	Federal Regulations and Policies	4.11-91
		4.11D.2.2	State Regulations and Policies	4.11-97
	4.11D.3	System-Wide	e Setting	4.11-97
	4.11D.4	Regional and	Local Setting and Regulatory Context	4.11-97
	4.11D.5	Standards of	Significance	4.11-98
	4.11D.6	Analytical M	lethods	4.11-98
	4.11D.7	Introduction	to Impacts and Mitigation Measures	4.11-102
	4.11D.8	Impact 11-6:	Impact, Analysis, and Mitigation Measures	4.11-102
		4.11D.8.1	Evaluation of Impact 11-6 to Entire System	4.11-102
		4.11D.8.2	Mitigation Measures	4.11-102
		4.11D.8.3	Impact 11-6: Level of Significance	
			After Mitigation	4.11-103
	4.11.9	References		4.11-104
4.12 Transpor	tation			4.12-1
-		ion to Transp	ortation	4.12-1
		Vide Regulato		4.12-1
		Wide-Setting		4.12-2
			tting and Regulatory Context	4.12-3
		Shasta Regio		4.12-3
		DeSabla Reg		4.12-9
		Drum Regio		4.12-14
			Regional Bundle	4.12-21
			-Helms Regional Bundle	4.12-28
4.12.5		s of Significar	S .	4.12-33
		al Methods		4.12-33
			/ehicular Trips Resulting from a	
			es and/or New Employment Opportunities	4.12-34

	4.12.6.2 Restriction of Access Opportunities Across	
	Project Lands Resulting in the Potential	
	Disruption of Existing Travel Patterns	4.12-36
	Introduction to Impacts and Mitigation Measures	4.12-36
4.12.8	Impact 12-1: Impact, Analysis, and Mitigation Measures	4.12-36
	4.12.8.1 Shasta Regional Bundle	4.12-36
	4.12.8.2 DeSabla Regional Bundle	4.12-37
	4.12.8.3 Drum Regional Bundle	4.12-38
	4.12.8.4 Motherlode Regional Bundle	4.12-39
	4.12.8.5 Kings Crane-Helms Regional Bundle	4.12-40
	4.12.8.6 Evaluation of Impact 12-1 to Entire System	4.12-41
	4.12.8.7 Impact 12-1: Mitigation Measures	4.12-41
	4.12.8.8 Impact 12-1: Level of Significance After Mitigation	4.12-42
4.12.9	Impact 12-2: Impact, Analysis, and Mitigation Measures	4.12-43
	4.12.9.1 Shasta Regional Bundle	4.12-43
	4.12.9.2 DeSabla Regional Bundle	4.12-43
	4.12.9.3 Drum Regional Bundle	4.12-43
	4.12.9.4 Motherlode Regional Bundle	4.12-43
	4.12.9.5 Kings Crane-Helms Regional Bundle	4.12-44
	4.12.9.6 Impact 12-2: Mitigation Measures	4.12-44
	4.12.9.7 Impact 12-2: Level of Significance After Mitigation	4.12-48
4.12.10	O References	4.12-49
4.13 Noise		4.13-1
	Introduction	4.13-1
	System-Wide Regulatory Context	4.13-4
	4.13.2.1 Federal Regulations and Policies	4.13-4
	4.13.2.2 State Regulations and Policies	4.13-5
	4.13.2.3 Regional Regulations and Policies	4.13-5
4.13.3	System-Wide Setting	4.13-5
	Regional and Local Setting and Regulatory Context	4.13-6
111011	4.13.4.1 Shasta Regional Bundle	4.13-6
	4.13.4.2 DeSabla Regional Bundle	4.13-8
	4.13.4.3 Drum Regional Bundle	4.13-9
	4.13.4.4 Motherlode Regional Bundle	4.13-11
	4.13.4.5 Kings Crane-Helms Regional Bundle	4.13-12
4.13.5	Standards of Significance	4.13-13
	Analytical Methods	4.13-14
	Introduction to Impacts and Mitigation Measures	4.13-15
	Impact 13-1: Impact, Analysis, and Mitigation Measures	4.13-15
1.10.0	4.13.8.1 Evaluation of Impact 13-1 to Entire System	4.13-16
	4.13.8.2 Impact 13-1: Mitigation Measures	4.13-16
4 13 9	Impact 13-2: Impact, Analysis, and Mitigation Measures	4.13-16
1.10.0	4.13.9.1 Evaluation of Impact 13-2 to Entire System	4.13-16
	4.13.9.2 Impact 13-2: Mitigation Measures	4.13-18
	4.13.9.3 Level of Significance After Mitigation	4.13-19
4 13 10	References	4.13-20

4.14	Air Qual	ity	4.14-1
		Introduction to Air Quality Resources	4.14-1
		System-Wide Regulatory Context	4.14-1
		4.14.2.1 Federal Regulations and Policies	4.14-1
		4.14.2.2 State Regulations and Policies	4.14-1
		4.14.2.3 Regional Regulations and Policies	4.14-2
	4.14.3	System-Wide Air Quality Setting	4.14-4
		4.14.3.1 Regional Climatologic Conditions of the Study Area	4.14-4
		4.14.3.2 Criteria Pollutants	4.14-4
		4.14.3.3 Toxic Air Contaminants	4.14-5
		4.14.3.4 Air Basin Attainment Status	4.14-5
	4.14.4	Regional and Local Setting and Regulatory Context	4.14-7
		4.14.4.1 Shasta Regional Bundle	4.14-8
		4.14.4.2 DeSabla Regional Bundle	4.14-11
		4.14.4.3 Drum Regional Bundle	4.14-16
		4.14.4.4 Motherlode Regional Bundle	4.14-19
		4.14.4.5 Kings Crane-Helms Regional Bundle	4.14-21
	4.14.5	Standards of Significance	4.14-23
		4.14.5.1 Project-Wide Significance Criteria	4.14-23
	4.14.6	Analytical Methods	4.14-30
		4.14.6.1 Emission Sources	4.14-30
	4 1 4 7	4.14.6.2 Emission Estimation Methodology	4.14-32
		Introduction to Impacts and Mitigation Measures	4.14-36
	4.14.8	Impact 14-1: Impact, Analysis, and Mitigation Measures	4.14-37
		4.14.8.1 Evaluation of Impact 14-1 to Entire System	4.14-38 4.14-40
		4.14.8.2 Impact 14.1: Mitigation Measures	4.14-40 4.14-41
	1110	4.14.8.3 Impact 14-1: Level of Significance After Mitigation	4.14-41
	4.14.9	Impact 14-2: Impact, Analysis, and Mitigation Measures 4.14.9.1 Impact 14-2: Shasta Regional Bundle	4.14-41
		4.14.9.2 Impact 14-2. DeSabla Regional Bundle	4.14-41
		4.14.9.3 Impact 14-2: Desabla Regional Bundle	4.14-45
		4.14.9.4 Impact 14-2: Motherlode Regional Bundle	4.14-43
		4.14.9.5 Impact 14-2: Kings Crane-Helms Regional Bundle	4.14-51
		4.14.9.6 Evaluation of Impact 14-2 to Entire System	4.14-58
		4.14.9.7 Impact 14-2: Mitigation Measures	4.14-58
		4.14.9.8 Impact 14-2: Level of Significance After Mitigation	4.14-61
	4.14.10	0 References	4.14-61
		VOLUME 7	
Δ 15	Aesthetic	re	
1.10	4.15.1		4.15-1
		ystem-Wide Regulatory Context	4.15-1
	1.10.20	4.15.2.1 Federal Regulations and Policies	4.15-1
		4.15.2.2 State Regulations and Policies	4.15-2
	4.15.3	System-Wide Setting	4.15-3
	4.15.4	Regional and Local Setting, and Regulatory Context	4.15-3
	-	4.15.4.1 Shasta Regional Bundle	4.15-4

		4.15.4.2 DeSabla Regional Bundle	4.15-11
		4.15.4.3 Drum Regional Bundle	4.15-22
		4.15.4.4 Motherlode Regional Bundle	4.15-27
		4.15.4.5 Kings Crane-Helms Regional Bundle	4.15-32
	4.15.5	Standards of Significance	4.15-44
	4.15.6	Analytical Methods	4.15-44
		4.15.6.1 General Methodology	4.15-44
		4.15.6.2 Analytical Approach for Land Development Impacts	4.15-45
		4.15.6.3 Analytical Approach for Timber Harvest Impacts	4.15-46
		4.15.6.4 Analytical Approach For Operational Changes In	
		Reservoir Levels	4.15-47
	4.15.7	Introduction to Impacts and Mitigation Measures	4.15-48
	4.15.8	Impact 15-1: Impact, Analysis, and Mitigation Measures	4.15-48
		4.15.8.1 Impact 15-1: Shasta Regional Bundle	4.15-48
		4.15.8.2 Impact 15-1: DeSabla Regional Bundle	4.15-52
		4.15.8.3 Impact 15-1: Drum Regional Bundle	4.15-59
		4.15.8.4 Impact 15-1: Motherlode Regional Bundle	4.15-65
		4.15.8.5 Impact 15-1: Kings Crane-Helms Regional Bundle	4.15-69
		4.15.8.6 Evaluation of Impact 15-1 to Entire System	4.15-73
		4.15.8.7 Impact 15-1: Mitigation Measures	4.15-73
		4.15.8.8 Impact 15-1: Level of Significance After Mitigation	4.15-74
	4.15.9	Impact 15-2: Impact, Analysis, and Mitigation Measures	4.15-74
		4.15.9.1 Evaluation of Impact 15-2 to Entire System	4.15-74
		4.15.9.2 Impact 15-2: Mitigation Measures	4.15-74
	4.15.10	References	4.15-75
4.16	Geology.	Soils, and Minerals	4.16-1
	4.16.1	Introduction to Geology, Soils and Mineral Resources	4.16-1
	4.16.2	System-Wide Regulatory Context	4.16-1
		4.16.2.1 Federal Regulations and Policies	4.16-2
		4.16.2.2 State Regulations and Policies	4.16-2
	4.16.3	System-Wide Setting	4.16-7
		4.16.3.1 Geology and Topography	4.16-7
		4.16.3.2 Faulting and Seismicity	4.16-8
		4.16.3.3 Soils	4.16-19
		4.16.3.4 Other Geologic Hazards	
		(Landslides, Volcanic Activity, and Avalanche)	4.16-20
	4.16.4	Regional and Local Setting and Regulatory Context	4.16-21
		4.16.4.1 Shasta Regional Bundle	4.16-23
		4.16.4.2 DeSabla Regional Bundle	4.16-23
		4.16.4.3 Drum Regional Bundle	4.16-50
		4.16.4.4 Motherlode Regional Bundle	4.16-67
		4.16.4.5 Kings Crane-Helms Regional Bundle	4.16-75
	4.16.5	Standards of Significance	4.16-91
	4.16.6	Analytical Methods	4.16-91
		4.16.6.1 Sources of Potential Impacts	4.16-91
		4.16.6.2 Establishment of Baseline Conditions and	4.16-92
		Method of Analysis	4.16-92

	4.16.6.3 Potential Effects Considered But Not Evaluated	
	in Detail in the Impact Analysis	4.16-92
	4.16.6.4 Potential Effects Evaluated in Other	
	Technical Sections of this EIR	4.16-93
4.16.7	Introduction to Impacts and Mitigation Measure	4.16-94
4.16.8	Impact 16-1: Impact, Analysis, and Mitigation Measures	4.16-95
	4.16.8.1 Impact 16-1: Shasta Regional Bundle	4.16-95
	4.16.8.2 Impact 16-1: DeSabla Regional Bundle	4.16-96
	4.16.8.3 Impact 16-1: Drum Regional Bundle	4.16-96
	4.16.8.4 Impact 16-1: Motherlode Regional Bundle	4.16-97
	4.16.8.5 Impact 16-1: Kings Crane-Helms Regional Bundle	4.16-97
	4.16.8.6 Evaluation of Impact 16-1 to Entire System	4.16-97
4.40.0	4.16.8.7 Impact 16-1: Mitigation Measures	4.16-98
4.16.9	Impact 16-2: Impact, Analysis, and Mitigation Measures	4.16-98
	4.16.9.1 Impact 16-2: Shasta Regional Bundle	4.16-99
	4.16.9.2 Impact 16-2: DeSabla Regional Bundle	4.16-99
	4.16.9.3 Impact 16-2: Drum Regional Bundle	4.16-99
	4.16.9.4 Impact 16-2: Motherlode Regional Bundle	4.16-100
	4.16.9.5 Impact 16-2: Kings Crane-Helms Regional Bundle	4.16-100
	4.16.9.6 Evaluation of Impact 16-2 to Entire System	4.16-100
1 10 10	4.16.9.7 Impact 16-2: Mitigation Measures	4.16-101
4.16.10	Impact 16-3: Impact, Analysis, and Mitigation Measures 4.16.10.1 Impact 16-3: Shasta Regional Bundle	4.16-101
	1	4.16-102 4.16-102
	4.16.10.2 Impact 16-3: DeSabla Regional Bundle 4.16.10.3 Impact 16-3: Drum Regional Bundle	4.16-102
	4.16.10.4 Impact 16-3: Motherlode Regional Bundle	4.16-102
	4.16.10.5 Impact 16-3: Modifier oue Regional Bundle	4.16-103
	4.16.10.6 Impact 16-3: Mitigation Measures	4.16-103
	4.16.10.7 Impact 16-3: Witigation Weastres 4.16.10.7 Impact 16-3: Level of Significance After Mitigation	4.16-103
4.16.11	Impact 16-4: Impact, Analysis, and Mitigation Measures	4.16-104
4.10.11	4.16.11.1 Evaluation of Impact 16-4 to Entire System	4.16-104
	4.16.11.2 Impact 16-4: Mitigation Measures	4.16-105
	4.16.11.3 Impact 16-4: Level of Significance After Mitigation	4.16-105
4 16 12	Impact 16-5: Impact, Analysis, and Mitigation	4.16-105
1.10.12	4.16.11.1 Impact 16-5: Shasta Regional Bundle	4.16-105
	4.16.12.2 Impact 16-5: DeSabla Regional Bundle	4.16-106
	4.16.12.3 Impact 16-5: Drum Regional Bundle	4.16-106
	4.16.12.4 Impact 16-5: Motherlode Regional Bundle	4.16-107
	4.16.12.5 Impact 16-5: Kings Crane-Helms Regional Bundle	4.16-107
	4.16.12.6 Evaluation of Impact 16-5 to Entire System	4.16-107
	4.16.12.7 Impact 16-5: Mitigation Measures	4.16-107
4.16.13	Impact 16-6: Impact, Analysis, and Mitigation Measures	4.16-108
3	4.16.13.1 Impact 16-6: Shasta Regional Bundle	4.16-109
	4.16.13.2 Impact 16-6: DeSabla Regional Bundle	4.16-109
	4.16.13.3 Impact 16-6: Drum Regional Bundle	4.16-109
	4.16.13.4 Impact 16-6: Motherlode Regional Bundle	4.16-110
	4.16.13.5 Impact 16-6: Kings Crane-Helms Regional Bundle	4.16-111
	4.16.13.6 Evaluation of Impact 16-6 to Entire System	4.16-112

			4.16.13.7 Impact 16-6: Mitigation Measures	4.16-112
			4.16.13.8Impact 16-6: Level of Significance After Mitigation	4.16-112
		4.16.14		4.16-112
			4.16.14.1 Impact 16-7: Shasta Regional Bundle	4.16-113
			4.16.14.2 Impact 16-7: DeSabla Regional Bundle	4.16-113
			4.16.14.3 Impact 16-7: Drum Regional Bundle	4.16-113
			4.16.14.4 Impact 16-7: Motherlode Regional Bundle	4.16-113
			4.16.14.5 Impact 16-7: Kings Crane-Helms Regional Bundle	4.16-113
			4.16.14.6 Evaluation of Impact 16-7 to Entire System	4.16-114
			4.16.14.7 Impact 16-7: Mitigation Measures	4.16-114
			4.16.14.8 Impact 16-7: Level of Significance After Mitigation	4.16-114
		4 16 15	Impact 16-8: Impact, Analysis, and Mitigation Measures	4.16-114
		1.10.10	4.16.15.1 Impact 16-8: Shasta Regional Bundle	4.16-115
			4.16.15.2 Impact 16-8: DeSabla Regional Bundle	4.16-117
			4.16.15.3 Impact 16-8: Drum Regional Bundle	4.16-117
			4.16.15.4 Impact 16-8: Motherlode Regional Bundle	4.16-117
			•	4.16-117
			1 0	
			4.16.15.6 Evaluation of Impact 16-8 to Entire System	4.16-118
			4.16.15.7 Impact 16.8: Mitigation Measures	4-16-118
		4 10 10	4.16.15.8 Impact 16-8: Level of Significance After Mitigation	4.16-118
		4.10.10	Impact 16-9: Impact, Analysis, and Mitigation Measures	4.16-119
			4.16.16.1 Evaluation of Impact 16-9 to Entire System	4.16-119
			4.16.16.2 Impact 16-9: Mitigation Measures	4.16-119
		4 10 17	4.16.16.3 Impact 16-9: Level of Significance After Mitigation	4.16-120
		4.16.17	Impact 16-10: Impact, Analysis, and Mitigation Measures	4.16-120
			4.16.17.1 Evaluation of Impact 16-10 to Entire System	4.16-120
			4.16.17.2 Impact 16-10: Mitigation Measures	4.16-121
		4 10 10	4.16.17.3 Impact 16-10: Level of Significance After Mitigation	4.16-121
		4.16.18	References	4.16-121
5.	ADI	DITIONA	L CEQA CONSIDERATIONS	
	5.1		Inducing Effects	5.1-1
		5.1.1	Introduction	5.1-1
		5.1.2	Development of Project Lands	5.1-1
			5.1.2.1 Impact to Entire Shasta Regional Bundle	5.1-1
			5.1.2.2 Impact to Entire DeSabla Regional Bundle	5.1-2
			5.1.2.3 Impact to Entire Drum Regional Bundle	5.1-4
			5.1.2.4 Impact to Entire Motherlode Regional Bundle	5.1-6
			5.1.2.5 Impact to Entire Kings Crane-Helms Regional Bundle	5.1-7
			5.1.2.6 Evaluation of Impacts to the Entire System	5.1-8
		5.1.3	Changes in Consumptive Water Supply	5.1-9
			5.1.3.1 Shasta Region	5.1-12
			5.1.3.2 DeSabla Region	5.1-13
			5.1.3.3 Drum Region	5.1-14
			5.1.3.4 Motherlode Region	5.1-16
			5.1.3.5 Kings Crane-Helms Region	5.1-17
			5.1.3.6 Evaluation of Impacts to the Entire System	5.1-18
			· · · · · · · · · · · · · · · · · · ·	

5.2		Considered but Eliminated from Detailed Analysis	5.2-1
5.3	0	ant Irreversible Environmental Changes	5.3-1
	5.3.1	Water	5.3-1
	5.3.2	Lands	5.3-1
	5.3.3		5.3-1
	5.3.4	Minerals	5.3-2
5.4	Cumula	itive Impacts	5.4 - 1
	5.4.1	Statewide Programs and Projects	5.4-2
		5.4.1.1 CALFED	5.4-2
		5.4.1.2 Central Valley Project Improvement Act (CVPIA)	5.4-4
		5.4.1.3 California 4.4 Plan	5.4 - 5
		5.4.1.4 Clean Water Act–Total Maximum Daily Load (TMDL) Program	5.4-7
	5.4.2	Future Power Plant Development	5.4-7 5.4-7
	3.4.2	5.4.2.1 Introduction	
			5.4-7
		5.4.2.2 Thermal Power Plants with Approved, Pending,	r 4 0
		or Expected Applications	5.4-8
		5.4.2.3 SCE Hydroelectric Asset Valuation	5.4-14
	.	5.4.2.5 Cumulative Effects of Future Power Plant Development	5.4-15
	5.4.3	Local Cumulative Projects	5.4-15
	5.4.4	Potential Cumulative Effects	5.4-16
		5.4.4.1 Land Use	5.4-16
		5.4.4.2 Forestry	5.4-18
		5.4.4.3 Hydrology and Water Quality	5.4-19
		5.4.4.4 Fisheries and Aquatic Biology	5.4-23
		5.4.4.5 Terrestrial Biology	5.4-24
		5.4.4.6 Recreation	5.4 - 28
		5.4.4.7 Cultural Resources	5.4 - 29
		5.4.4.8 Agriculture	5.4-31
		5.4.4.9 Hazards and Hazardous Materials	5.4 - 32
		5.4.4.10 Population, Employment, and Housing	5.4 - 33
		5.4.4.11 Public Services and Utilities	5.4 - 34
		5.4.4.12 Transportation	5.4 - 36
		5.4.4.13 Noise	5.4-38
		5.4.4.14 Air Quality	5.4 - 40
		5.4.4.15 Aesthetics	5.4 - 40
		5.4.4.16 Geology, Soils, and Minerals	5.4-41
	5.4.5	References	5.4-57
ALT	ERNAT	IVES	
6.1	Introdu	ction	6-1
6.2	Project	Background	6-3
6.3	U	Objectives	6-3
6.4	•	tives Screening Methodology	6-5
6.5		tives to the Project	6-6
6.6		on of the Alternatives to the Project	6-7
		Valuation Method	6-7

6.

		0 0 1 1	Annoisal	6.7
		6.6.1.1		6-7
			Negotiated Sale	6-7 6-8
			Price-Only Auction Conditioned Auction	6-8
	669			6-8
	0.0.2		of Hydroelectric Facilities (and Project Lands) Entire System	6-8
			Five or 20 Bundles	
			Sixteen Bundles	6-8 6-8
			Individual Projects (29 Bundles)	6-8
	6.6.3			6-9
	0.0.3	Ownership	p Pacific Gas and Electric Company	6-9
			Single Owner (not Pacific Gas and Electric Company)	6-9
			State of California	6-9
			Multiple Owners	6-9
	6.6.4		Ratemaking	6-9
	0.0.4		Cost-of-Service Regulation	6-9
			Performance-Based Ratemaking (Regulated)	6-10
			Performance-Based Ratemaking (Unregulated)	6-10
				6-10
	6.6.5		Unregulated Ratemaking	6-10 6-11
	0.0.3	6.6.5.1	of Hydroelectric Facilities	6-11
			PowerMax Scenario	6-11
			WaterMax Scenario	6-11
				6-11
			No Project A Conditions Increased Stream Flows in Papers Baseles	6-11
	6.6.6		Increased Stream Flows in Bypass Reaches ent of Lands	6-12
	0.0.0	_	Baseline Conditions	6-12
			Conservation Easements	6-12
			Restoration of Natural Conditions	6-12
				6-12
			More Intensive Management	
	0.07		Development of Lands	6-13
	6.6.7		ing Agreements	6-13
			Generally Continue Non-Binding Agreements	6-13
	660		Discontinuation of Non-Binding Agreements	6-13
e 7	6.6.8		al Obligations and Agreements	6-13
6.7			ternatives to the Project	6-14
	6.7.1		re 1: No Project (A) Pacific Gas and Electric	6-14
	6.7.2	-	any Regulated	0-14
	0.7.2		e 2: No project (B) Pacific Gas and Electric	C 15
	679		ny Unregulated re 3: Proposed Pacific Gas and Electric Company Settlement	6-15 6-15
	6.7.3 $6.7.4$		1 0	6-22
	6.7.5		re 4: Proposed Settlement (Regulated) re 5: Projects Bundled by River Basin	6-22
	6.7.6		re 6: Individual Bundles	6-26
	6.7.7		re 7: Bundle Watershed Lands for Conservation	6-26
	6.7.8			6-28
	0.7.8		re 8: Decommissioning of Selected Facilities	
			Potter Valley (Scott and Cape Horn Dams) Kilara (Cape Crock (Kilara and Cape Crock Dams)	6-33
		6.7.8.2	Kilarc/Cow Creek (Kilarc and Cow Creek Dams)	6-33

		6.7.8.3		k (Eagle Canyon, Wildcat, Coleman,	e 99
		6701		th Fork Dams)	6-33
	670	6.7.8.4		k (Centerville Dam)	6-33
6 0	6.7.9			onmental Composite Alternate	6-34
6.8	Summ			Economic Analysis Results	6-34
		6.8.1		er Generation and Powerhouse Flows	6-34
		6.8.2	Reservoir		6-36
	0.0	6.8.3		ower Plant Emissions	6-47
	6.9	-		ed Alternatives	6-47
		6.9.1		Iternative 1: Single Owner	0.47
		0.00		ific Gas and Electric Company)	6-47
		6.9.2		Iternative 2: Regional Bundles	0.47
		0.00		Single Individual Bundle	6-47
		6.9.3		Iternative 3: Partial/Interim Retention	0.50
		0.0.4		ic Gas and Electric Company of Selected Facilities	6-50
		6.9.4		Iternative 4: Environmental Enhancement	6-50
		6.9.5		Iternative 5: Alternative Valuation	6-53
		6.9.6		Iternative 6: Interim State Ownership	6-56
	0.10	6.9.7		Iternative 7: Alternate Ratemaking (Regulated)	6-58
	6.10		ison of Alteri		6-58
	6.11			native Assumptions to Potential Impacts	6-69
			Valuation	C A	6-69
		6.11.2	Bundling o	1 Assets	6-69
		6.11.3	Ownership		6-69
		6.11.4	Ratemaking		6-69
		6.11.5	_	of Hydroelectric Facilities	6-71
		6.11.6		nt of Lands	6-72
		6.11.7		ng Agreements	6-72
	6.12	6.11.8	Conclusion		6-73
	0.12	•		nental Effects of Alternatives to the Project	6-78 6-78
		6.12.1	•	(A): Pacific Gas and Electric Company Regulated	
		6.12.2	•	(B): Pacific Gas and Electric Company Unregulated	6-78
		6.12.3	· -	Pacific Gas and Electric Company	0.70
				ent Agreement	6-79
			6.12.3.1	Land Use	6-79
			6.12.3.2	Forestry	6-80
			6.12.3.3	Hydrology and Water Quality	6-80
			6.12.3.4	Fisheries and Aquatic Biology	6-81
			6.12.3.5	Terrestrial Biology	6-82
			6.12.3.6	Recreation Cultural Resources	6-82
			6.12.3.7		6-83
			6.12.3.8	Agriculture	6-84
			6.12.3.9	Hazards and Hazardous Materials Population Employment and Housing	6-85
			6.12.3.10	Population, Employment, and Housing	6-85
			6.12.3.11	Public Services and Utilities	6-85
			6.12.3.12 6.12.3.13	Transportation Noise	6-86 6-87
				Air Quality	6-87
			U. 14 .1.14	All whally	U-0/

	6.12.3.15	Aesthetics	6-89
	6.12.3.16	Geology, Soils, and Minerals	6-89
6.12.4	Proposed S	Settlement (Regulated)	6-90
	$6.1\overline{2}.4.1$	Hydrology and Water Quality	6-91
	6.12.4.2	Fisheries and Aquatic Biology	6-91
	6.12.4.3	· 00	6-92
	6.12.4.4	Cultural Resources	6-92
	6.12.4.5	Agriculture	6-93
	6.12.4.6	O	6-93
6.12.5	Projects Bu	undled by River Basin	6-94
6.12.6	U	•	6-94
6.12.7	Bundle Wa	ntershed Lands for Conservation	6-96
	6.12.7.1	Land Use	6-96
	6.12.7.2	Forestry	6-96
	6.12.7.3	Hydrology and Water Quality	6-97
	6.12.7.4	Fisheries and Aquatic Biology	6-97
	6.12.7.5	Terrestrial Biology	6-97
	6.12.7.6	65	6-98
		Cultural Resources	6-98
		Agriculture	6-99
	6.12.7.9	O	6-99
	6.12.7.10		6-100
	6.12.7.11		6-100
	6.12.7.12	Transportation	6-100
	6.12.7.13	<u>.</u>	6-100
		Air Quality	6-101
	6.12.7.15	• •	6-101
	6.12.7.16	Geology, Soils, and Minerals	6-101
6.12.8		sioning of Selected Facilities	6-102
0.12.0	6.12.8.1	•	6-102
	6.12.8.2	Forestry	6-103
	6.12.8.3	Hydrology and Water Quality	6-103
	6.12.8.4	Fisheries and Aquatic Biology	6-104
	6.12.8.5	Terrestrial Biology	6-105
	6.12.8.6		6-105
	6.12.8.7	Cultural Resources	6-105
	6.12.8.8	Agriculture	6-106
	6.12.8.9	Hazards and Hazardous Materials	6-106
	6.12.8.10	Population, Employment, and Housing	6-107
	6.12.8.11	Public Services and Utilities	6-107
	6.12.8.12	Transportation	6-107
	6.12.8.13	Noise	6-108
	6.12.8.14	Air Quality	6-108
	6.12.8.15	An Quanty Aesthetics	6-108
	6.12.8.16		6-108
6.12.9		ω	6-109 6-109
0.12.9	6.12.9.1	ental Composite Alternate Land Use	6-109 6-109
			6-109
	6.12.9.2	Forestry	0-109

	6.12	.9.3 Hydrology and Water Quality	6-110
	6.12	.9.4 Fisheries and Aquatic Biology	6-111
	6.12	.9.5 Terrestrial Biology	6-111
	6.12	.9.6 Recreation	6-112
	6.12	.9.7 Cultural Resources	6-112
	6.12	.9.8 Agriculture	6-113
	6.12	.9.9 Hazards and Hazardous Materials	6-114
	6.12	.9.10 Population, Employment, and Housing	6-114
	6.12	.9.11 Public Services and Utilities	6-114
	6.12	.9.12 Transportation	6-115
	6.12	.9.13 Noise	6-115
	6.12	.9.14 Air Quality	6-115
	6.12	.9.15 Aesthetics	6-116
	6.12	.9.16 Geology, Soils, and Minerals	6-116
6.13	Analysis Of Fo	ocused Alternatives	6-117
	6.13.1 Sing	le Owner (not Pacific Gas and Electric Company)	6-117
	6.13.2 Bune	dles Minus a Single Hydroelectric Facility	6-117
	6.13.3 Part	ial/Interim Retention of Selected Facilities	6-118
	6.13.4 Env	ironmental Enhancement	6-119
	6.13.5 Alte	rnative Valuation	6-120
	6.13.6 Inter	rim State Ownership	6-120
		ormance-Based (Regulated) Ratemaking	6-121
6.14		The Alternatives To Result In Market Power	6-121
		ket Power Potential	6-121
		rological and Utility System Modeling	6-123
		rnative 1 (No Project A: Pacific Gas and	
		lectric Company Regulated)	6-124
		rnative 2 (No Project B: Pacific Gas and	
		lectric Company Unregulated)	6-124
		rnative 3 (Proposed Settlement Agreement)	6-128
		rnative 5 (Bundled by River Basin)	6-130
		rnative 6 (Individual Bundles)	6-131
6.15	-	Of Impacts Of The Alternatives	6-132
6.16	Environmenta	ally Superior Alternative	6-150
6.17	Alternatives S	Suggested In Scoping Comments	6-153
		gested Alternatives That are Analyzed in This EIR	6-153
		er Suggested Alternatives That are Not	
		nalyzed in This EIR	6-157
6.18	References		6-160
7. REPORT P	REPARATION	I	7-1
8. GLOSSARY	AND ACRON	NYMS	8-1

VOLUME 8

APPENDICES

Appendix A Relevant California Public Utilities Codes

Appendix B Descriptions of the Utility and Hydropower Systems

Appendix C Hydrological and Utility System Modeling

Appendix D Binding and Non-Binding Agreements

Appendix E Sensitive Plant Species

Appendix F Sensitive Wildlife Species

Appendix G Air Quality Data Sheets

VOLUME 9

Appendix H Fisheries Technical Data and Figures

Appendix I Monthly Unimpaired Flow Data

LIST OF TABLES

Table		Page
	VOLUME 1	
EXEC	UTIVE SUMMARY	
S-1	Summary of Project Impacts and Mitigation by Resource	S-1
S-2	Comparison of the Impacts of the Alternatives	S-66
S-3	Comparison of the Impacts of the Focused Alternatives	S-77
2.	PROJECT DESCRIPTION	
2-1	Lands Proposed for Auction	2-48
2-2	Shasta Regional Bundle Facilities	2-61
2-3	DeSabla Regional Bundle Facilities	3-72
2-4	Drum Regional Bundle Facilities	2-97
2-5	Motherlode Regional Bundle Facilities	2-106
2-6	Kings Crane-Helms Regional Bundle Facilities	2-120
3.	APPROACH TO ENVIRONMENTAL ANALYSIS	
3-1	Bundles Most Likely to Be Purchased and Reoperated for	
	Water Supply Purposes	3-18
3-2	GIS Model Analysis Categories	3-43
3-3	Estimated Development on Project Lands	3-47
3-4	Estimated Development for the Shasta Regional Bundle	3-48
3-5	Estimated Development for the DeSabla Regional Bundle	3-55
3-6	Estimated Development for the Drum Regional Bundle	3-65
3-7	Estimated Development for the Motherlode Regional Bundle	3-70
3-8	Estimated Development Yield for the Kings Crane-Helms Regional Bundle	3-76
3-9	Timber Harvest Management Practices	3-88
3-10	Summary of Timber Harvest Assumptions	3-90
3-11	Baseline Harvest Scenario	3-92
3-12	Project Harvest Scenario	3-95
	VOLUME 2	
4.	ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEA	SURES
4.1 La	and Use	
4.1-1	Acreage Summary for the Shasta Regional Bundle	4.1-8
4.1-2	Shasta County General Plan Designations and Zoning Classifications	4.1-11
4.1-3	Tehama County General Plan Designations and Zoning Classifications	4.1-12
4.1-4	Acreage Summary for the DeSabla Regional Bundle	4.1-19
4.1-5	Butte County General Plan Designations and Zoning Classifications	4.1-21
4.1-6	Plumas County General Plan Designations and Zoning Classifications	4.1-23
4.1-7	Lassen County General Plan Designations and Zoning Classifications	4.1-24
4.1-8	Acreage Summary for the Drum Regional Bundle	4.1-33
4.1-9	Placer County General Plan Designations and Zoning Classifications	4.1-36
	Nevada County General Plan Designations and Zoning Classifications	4.1-37
	El Dorado County General Plan Designations and Zoning Classifications	4.1-38
	Mendocino County General Plan Designations and Zoning Classifications	4.1-39
4.1-13	Lake County General Plan Designations and Zoning Classifications	4.1-40

<u>Table</u>		<u> Page</u>
4 1 1		4 4 44
	Yuba County General Plan Designations and Zoning Classifications	4.1-41
	A Acreage Summary for the Motherlode Regional Bundle	4.1-45
	A Amador County General Plan Designations and Zoning Classifications	4.1-46
	Alpine County General Plan Designations and Zoning Classifications	4.1-47
	3 Calaveras County General Plan Designations and Zoning Classifications	4.1-48
	Tuolumne County General Plan Designations and Zoning Classifications	4.1-48
	Merced County General Plan Designations and Zoning Classifications	4.1-49
	Mariposa County General Plan Designations and Zoning Classifications	4.1-50
	2 Acreage Summary for the Kings Crane-Helms Regional Bundle	4.1-53
	B Madera County General Plan Designations and Zoning Classifications	4.1-56
	Fresno County General Plan Designations and Zoning Classifications	4.1-57
	Tulare County General Plan Designations and Zoning Classifications	4.1-58
	6 Kern County General Plan Designations and Zoning Classifications	4.1-59
4.1-27	Pacific Gas and Electric Company Proposed Project Land Breakdown	4.1-64
4.1-28	3 Summary of Significant Impacts of Land Development	4.1-73
4.2	Forestry Accord Values Bird Mind Confor Buring Timbuland	
4.2-1	Assessed Values – Pine-Mixed Conifer Region – Timberland	494
199	Production Zoning Forest Agree All Regions	4.2-4 4.2-5
4.2-2	Forest Acres - All Regions	
4.2-2	Shasta Region Forest Acres	4.2-11
4.2-3	Active Timber Harvesting Plans - Shasta Region	4.2-11
4.2-4	DeSabla Region Forest Acres	4.2-15
4.2-5	DeSabla Region – Active Timber Harvesting Plans	4.2-16
4.2-6	Drum Region Forest Acres	4.2-21
4.2-7	Drum Region Active Timber Harvesting Plans	4.2-21
4.2-8	Motherlode Region Forest Acres	4.2 - 25
4.2-9	Motherlode Region Active Timber Harvesting Plans	4.2 - 25
	Kings Crane Forest Acres	4.2-29
4.2-11	Projected Acres and Timber Volume Harvested Over the	
	First Five Years of Divestiture - All Regions	4.2-35
4.2 - 12	2 Shasta Region - Acres and Timber Volume Harvested	
	Projected Over the First Five Years of Divestiture	4.2 - 35
4.2-13	B DeSabla Region - Acres and Timber Volume Harvested Projected	
	Over the First Five Years of Divestiture	4.2-36
4.2-14	Drum Region - Acres and Timber Volume Harvest	
	Projected Over the First Five Years of Divestiture	4.2 - 37
4.2-15	Motherlode Region - Acres and Timber Volume Harvested	
	Projected Over the First Five Years of Divestiture	4.2-38
4.2-16	Kings Crane-Helms Region – Acres and Timber Volume Harvested	
	Projected Over the First Five Years of Divestiture	4.2-38
4.2-17	Estimated Reduction in Forest Inventories – Shasta Regional Bundle	4.2-39
	B Estimated Reduction in Forest Inventories – DeSabla Regional Bundle	4.2-40
	Estimated Reduction in Forest Inventories – Drum Regional Bundle	4.2-40
	Estimated Reduction in Forest Inventories – Motherlode	1, w 10
ત્ર.ພ⁻હ(Regional Bundle	4.2-41
4 9 ₋91	Estimated Reduction in Forest Inventories – Kings Crane-Helms	7.6-71
7.6-6	Regional Bundle	4.2-42
	IVERIONAL DUNUIC	4.6-46

<u>Table</u>		<u>Page</u>
4 0 00		4.0.40
	Loss of Timberland Acres and Productivity – Shasta Region	4.2-43
	Loss of Timberland Acres and Productivity - DeSabla Region	4.2-43
	Loss of Timberland Acres and Productivity – Drum Region	4.2-44
4.2-25	Loss of Timberland Acres and Productivity – Motherlode Region	4.2-44
4.3	Hydrology and Water Quality	
4.3-1	Pacific Gas and Electric Company Hydroelectric Assets 401	
	Certification Status – Shasta Regional Bundle	4.3-11
4.3-2	Pacific Gas and Electric Company Hydroelectric Assets 401	
	Certification Status – DeSabla Regional Bundle	4.3-12
4.3-3	Pacific Gas and Electric Company Hydroelectric Assets 401	
	Certification Status- Drum Regional Bundle	4.3-13
4.3-4	Pacific Gas and Electric Company Hydroelectric Assets 401	
	Certification Status – Motherlode Regional Bundle	4.3-14
4.3-5	Pacific Gas and Electric Company Hydroelectric Assets 401	
2,00	Certification Status – Kings Crane-Helms Regional Bundle	4.3-15
4.3-6	Minimum Releases Associated With the Hat Creek System	4.3-26
4.3-7	Minimum Release Associated with the Pit 3, 4, 5 System	4.3-34
	Minimum Release Associated with McCloud – Pit System	4.3-37
4.3-9	Minimum Release Associated with the Kilarc – Cow Creek System	4.3-40
	Minimum Releases Associated with the Battle Creek System	4.3-45
	Cloud Seeding Stations for the DeSabla Region	4.3-50
	Minimum Releases Associated with the Hamilton Branch System	4.3-52
	Minimum Releases Associated with the Upper North Fork Feather	1.0 02
1.0 10	River System	4.3-55
4 3-14	Minimum Releases Associated with the Rock Creek-Cresta System	4.3-59
	Minimum Releases Associated with the Poe System	4.3-63
	Minimum Releases Associated with the Bucks Creek System	4.3-64
	Minimum Release Associated with the DeSabla-Centerville System	4.3-67
4.0 17	William Refease Associated with the Desabla Centervine System	1.0 07
	VOLUME 3	
4.4	Fisheries and Aquatic Biology	
4.4-1	Distributional Checklist of the Fishes Potentially Affected By Pacific	
4.4-1	Gas and Electric Company's Hydroelectric System	4.4-5
119	Summary of Aquatic Resource Issue Areas Relevant to each Pacific	4.4-3
4.4-2	0 1	4.4-8
119	Gas and Electric Company Hydroelectric Project Distributional Charlest of the Eigher of the Shorte Pagional Bundle	4.4-0
4.4-3	Distributional Checklist of the Fishes of the Shasta Regional Bundle	4 4 91
4 4 4	by Pacific Gas and Electric Company Project Shorts Parisinal Pundle - Hot Creek Project (FEDC 2661) Fish	4.4-21
4.4-4	Shasta Regional Bundle – Hat Creek Project (FERC 2661) Fish	4 94
4 4 5	Species Occurrence by Location Shorts Particul Partitle District (FEDC 2007) Field Species	424
4.4-5	Shasta Regional Bundle – Pit 1 Project (FERC 2687) Fish Species	4 4 07
4.4.0	Occurrence by Location	4.4-37
4.4-6	Special-Status Fish Species That Occur in the Shasta Regional Bundle	4.4-39
4.4-7	Shasta Regional Bundle – Pit 3, 4 and 5 Project (FERC 0233) Fish	4 4 47
4.4.0	Species Occurrence by Location Shorts Particul Part II. McCloud Pit Particul (FEDC 2100) Find	4.4-47
4.4-8	Shasta Regional Bundle – McCloud-Pit Project (FERC 2106) Fish	
	Species Occurrence by Location	4.4-56

<u>Table</u>		<u>Page</u>
4.4.0	Charte Degistral Dundle Wileys Cons. Creek Duniert (EEDC 0000)	
4.4-9	Shasta Regional Bundle – Kilarc-Cow Creek Project (FERC 0606) Fish Species Occurrence by Location	4.4-61
<i>1 1</i> ₋ 10	Shasta Regional Bundle – Battle Creek Project (FERC 1121) Fish	4.4-01
4.4-10	Species Occurrence by Location	4.4-68
	Species occurrence by Location	1.1 00
4.4-11	Distributional Checklist of the Fishes of the DeSabla Regional	
	Bundle by Pacific Gas and Electric Company Project	4.4-74
4.4-12	DeSabla Regional Bundle - Hamilton Branch Project (Non-FERC)	
	Fish Species Occurrence by Location	4.4-79
4.4-13	DeSabla Regional Bundle - Upper North Fork Feather River Project	
	(FERC 2105) Fish Species Occurrence by Location	4.4-82
4.4-14	Special-Status Fish Species That Occur in the DeSabla Regional	
4 4 15	Bundle	4.4-86
4.4-15	DeSabla Regional Bundle - Rock Creek-Cresta Project (FERC 1962)	4 4 00
1 1 16	Fish Species Occurrence by Location Summary of Stream Bed Distances (in meters) to Barriers on	4.4-88
4.4-10	Tributaries to the North Fork Feather River and the East Branch of the North	
	Fork Feather River	4.4-92
4 4-17	Minimum Flows Below Rock Creek and Cresta Reservoirs for the	4.4-32
7,7 17	First 5-Year Test Period	4.4-93
4.4-18	DeSabla Regional Bundle - Poe Project (FERC 2107) Fish Species	1.1 00
1.1 10	Occurrence by Location	4.4-95
4.4-19	DeSabla Regional Bundle - Bucks Creek Project (FERC 0619) Fish	
	Species Occurrence by Location	4.4-98
4.4-20	DeSabla Regional Bundle - DeSabla-Centerville Project	
	(FERC 0803) Fish Species Occurrence by Location	4.4-104
4.4-21	DeSabla Regional Bundle - Lime Saddle Project (Non-FERC)	
	Fish Species Occurrence by Location	4.4-113
4.4-22	DeSabla Regional Bundle - Coal Canyon Project (Non-FERC)	
	Fish Species Occurrence by Location	4.4-114
4.4-23	Distributional Checklist of the Fishes of the Drum Regional	
	Bundle by Pacific Gas and Electric Company Project	4.4-116
4.4-24	Drum Regional Bundle - Narrows Project (FERC 1403) Fish	4 4 4 4 0
4 4 05	Species Occurrence by Location	4.4-119
4.4-25	Special-Status Fish Species That Occur in the Drum Regional Bundle	4 4 190
1 1 26		4.4-120
4.4-20	Drum Regional Bundle – Potter Valley Project (FERC 0077) Fish Species Occurrence by Location	4.4-131
1 1-27	Special-status Fish Species Critical Habitat Designations	4.4-132
	Drum Regional Bundle – Drum-Spaulding Project (FERC 2310)	4.4-152
1.1 20	Fish Species Occurrence by Location	4.4-136
4.4-29	Drum Regional Bundle - Chili Bar Project (FERC 2155)	4.4-147
	Distributional Checklist of the Fishes of the Motherlode Regional	
	Bundle by Pacific Gas and Electric Company Project	4.4-149
4.4-31	Motherlode Regional Bundle - Mokelumne River (FERC 0137)	
	Fish Species Occurrence by Location	4.4-151
4.4-32	Special-Status Fish Species That Occur in the Motherlode	
	Regional Bundle	4.4-163

<u>Table</u>		Page
4.4 - 33	Motherlode Regional Bundle - Spring Gap-Stanislaus Project	
	(FERC 2130) Fish Species Occurrence by Location	4.4-166
4.4-34	Motherlode Regional Bundle - Phoenix Project (FERC 1061)	
	Fish Species Occurrence by Location	4.4-173
4.4-35	Motherlode Regional Bundle - Merced Falls Project (FERC 2467)	
	Fish Species Occurrence by Location	4.4-177
4.4-36	Distributional Checklist of the Kings Crane-Helms Regional Bundle	
	by Pacific Gas and Electric Company Project	4.4-179
4.4-37	Kings Crane-Helms Regional Bundle - Crane Valley Project	
	(FERC 1354) Fish Species Occurrence by Location	4.4-183
4.4-38	Special-Status Fish Species That Occur in the Kings Crane-Helms	4 4 400
	Regional Bundle	4.4-188
4.4-39	Kings Crane-Helms Regional Bundle - Kerckhoff Project	
4 4 40	(FERC 0096) Fish Species Occurrence by Location	4.4-191
4.4-40	Kings Crane-Helms Regional Bundle - Helms Pumped Storage	4 4 100
4 4 41	Project (FERC 2735) Fish Occurrence by Location	4.4-196
4.4-41	Kings Crane-Helms Regional Bundle - Haas-Kings River Project	4 4 100
4 4 49	(FERC 1988) Fish Species Occurrence by Location	4.4-196
4.4-42	Kings Crane-Helms Regional Bundle - Balch Project (FERC 0175)	4 4 107
1 1 19	Fish Species Occurrence by Location Kings Cropp Helms Degional Bundle Tule Biver Project	4.4-197
4.4-43	Kings Crane-Helms Regional Bundle - Tule River Project (FERC 1333) Fish Occurrence by Location	4.4-206
1 1-11	Kings Crane-Helms Regional Bundle – Kern Canyon Project	4.4-200
4.4-44	(FERC 0178) Fish Species Occurrence by Location	4.4-210
1 1-15	Operational Classification of Pacific Gas and Electric Hydroelectric	4.4-210
1.1-10	Projects	4.4-213
4 4-46	Summary of the Physical Characteristics of Reservoirs Owned	1.1 210
1.1 10	or Influenced by the Operation of Pacific Gas and Electric Company's	
	Hydroelectric System and the Type of Fishery Associated with Each Reservoir	4.4-215
4.4-47	Stream Reaches with Reduced Flows in the North Fork Feather	1.1 210
	River	4.4-242
4.4-48	Difference in Percent of Peak Weighted Usable Area Available	
	Under Baseline and PowerMax Conditions	4.4-254
4.4-49	Percentages of Stream Segments with Water Temperatures Less	
	Than 68°F (20°C) During July at Several Flow Levels and Under Baseline	
	Conditions and the Two Scenarios	4.4-275
4.4-51	Assessment of End of Month Reservoir Storage Elevations and	
	Change in Storage That Would Occur in Lake Britton Under Baseline	
	Conditions Based on OASIS Mean Monthly Hydrologic Model Data Results	4.4-294
4.4-52	Assessment of End of Month Reservoir Storage Elevations and	
	Change in Storage That Would Occur in Lake Britton Under the PowerMax	
	Scenario Based on OASIS Mean Monthly Hydrologic Model Data Results	4.4-295
4.4-53	Summary of Potential Impacts to Reservoirs Before Mitigation and	
	Status After Mitigation	4.4-316

Table		Page
	VOLUME 4	
4.5	Terrestrial Biology	
4.5-1	Local Policies Associated with the Shasta Regional Bundle	4.5-25
4.5-2	Bundle 1 – Hat Creek Vegetation Communities Associated With	
	Hat 1 and 2 Project (FERC 2661)	4.5-29
4.5-3	Special-Status Wildlife Species That Are Known To Occur Or	
1.0 0	Potentially Occur In Bundle 1 (FERC 2661)	4.5-33
4.5-4	Bundle 1 - Special-Status Plant Species That Occur Or Potentially	-7.0
	Could Occur On the Hat Creek 1 and 2 Project (FERC 2661)	4.5-41
4.5-5	Bundle 2 – Pit River Vegetation Communities Associated With	
	the Pit 1 Project (FERC 2687); Pit 3, 4, and 5 Project (FERC 0233); and	
	McCloud-Pit Project (FERC 2106)	4.5-46
4.5.6	Bundle 2 - Pit River Special-Status Wildlife Species that Occur	
	Or Potentially Could Occur On the Pit 1 Project (FERC 2687); Pit 3, 4, and	
	5 Project (FERC 0233); and the McCloud-Pit Project (FERC 2106)	4.5-51
4.5-7	Bundle 2 – Pit River Special-Status Plant Species That Occur	
	Or Potentially Could Occur On the Pit 1 Project (FERC 2687); Pit 3, 4, and	4 5 65
150	5 Project (FERC 0233); and the McCloud-Pit Project (FERC 2106) Bundle 3 – Kilarc-Cow Creek Vegetation Communities Associated	4.5-65
4.5-8	With the Kilarc-Cow Creek Project (FERC 0606)	4.5-71
4.5-9	Bundle 3 – Kilarc-Cow Creek Special-Status Wildlife Species	4.5-71
1.0 0	That Occur Or Potentially Could Occur On the Kilarc-Cow Creek Project	
	(FERC 0606)	4.5-73
4.5-10	Bundle 3 – Kilarc-Cow Creek Special-Status Plant Species That	110 10
	Occur Or Potentially Could Occur On the Kilarc-Cow Creek Project	
	(FERC 0606)	4.5-80
4.5-11	Bundle 4 – Battle Creek Vegetation Communities Associated	
	With the Battle Creek Project (FERC 1121)	4.5-87
4.5-12	Bundle 4 – Battle Creek Special-Status Wildlife Species That	
	Occur Or Potentially Could Occur On the Battle Creek Project (FERC 1121)	4.5-88
4.5-13	Bundle 4 – Battle Creek Special-Status Plant Species That Occur	
4 5 4 4	Or Potentially Could Occur On the Battle Creek Project (FERC 1121)	4.5-98
	Local Policies Associated With the DeSabla Regional Bundle	4.5-108
4.5-15	Bundle 5 - Hamilton Branch Vegetation Communities Associated	4 ° 110
1516	With the Hamilton Branch Project (No FERC License) Bundle 5 - Hamilton Branch Threatened, Endangered, Or Sensitive	4.5-116
4.5-10	Wildlife Species That Occur or Potentially Could Occur in the Hamilton Brand	ch
	Project (No FERC License)	4.5-119
4 5-17	Bundle 5 - Special-Status Plant Species That Occur Or Potentially	4.0 110
1.0 17	Could Occur Within the Hamilton Project	4.5-121
4.5-18	Bundle 6 - Feather River Vegetation Communities Associated With	1.0 121
	the North Fork Feather River Project (FERC 2105); Rock Creek-Cresta	
	Project (FERC 1962); and the Poe Project (FERC 2107)	4.5-125
4.5-19	Bundle 6 - Special-Status Wildlife Species That Occur or	
	Potentially Could Occur on the Upper North Fork Feather River Project	
	(FERC 2105) / Rock Creek-Cresta Project (FERC 1962) / and the Poe	

<u>Table</u>		Page
	Project (FERC 2107)	4.5-128
4.5-20	Bundle 6 - Special-Status Plant Species That Occur or Potentially	
	Could Occur Within the Feather River Project (FERC 2105); Rock Creek-	
	Cresta Project (FEERC 1962); and Poe Project (FERC 2107)	4.5-140
4.5-21	Bundle 7 - Bucks Creek Vegetation Communities Associated	
	With the Bucks Creek Project (FERC 0619)	4.5-145
4.5-22	Bundle 7 - Bucks Creek Special-Status Species Wildlife That	
	Occur Or Potentially Could Occur On the Bucks Creek Project (FERC 0619)	4.5-147
4.5 - 23	Bundle 7 - Special-Status Plant Species That Occur or Potentially	
	Could Occur Within the Bucks Creek Project (FERC 0619)	4.5-151
4.5-24	Bundle 8 - Butte Creek Vegetation Communities Associated With	
	the DeSabla-Centerville Project (FERC 0803); Lime Saddle Project (No FERC	
	License); and the Coal Canyon Project (No FERC License)	4.5-153
4.5-25	Bundle 8 - Butte Creek Special-Status Wildlife Species That Occur	- >
	or Potentially Could Occur Within the DeSabla-Centerville Project (FERC 080	3)
	/ Lime Saddle Powerhouse Project (No FERC License)/Coal Canyon Project	
	(No FERC License)	4.5-156
4.5-26	Bundle 8 - Butte Creek Special-Status Plant Species That Occur	
	Or Potentially Could Occur Within the DeSabla-Centerville Project	
	(FERC 0803)	4.5-162
	Local Policies Associated With The Drum Regional Bundle	4.5-165
4.5-28	Bundle 9 – North Yuba River Vegetation Communities Associated	
	With the Narrows Project (FERC 1403)	4.5-178
4.5-29	Bundle 9 – North Yuba River Special-Status Wildlife Species	
	That Occur or Potentially Could Occur on the Narrows Project (FERC 1403)	4.5-179
4.5-30	Bundle 9 - North Yuba River Special-Status Plant Species That	
4 5 04	Occur Or Potentially Could Occur Within The Narrows Project (FERC 1403)	4.5-183
4.5-31	Bundle 10 – Potter Valley Vegetation Communities Associated	
4 5 00	With the Potter Valley Project (FERC 0077)	4.5-185
4.5-32	Bundle 10 – Potter Valley Special-Status Wildlife Species	
	That Occur or Potentially Could Occur Within the Potter Valley Project	4 5 405
4 5 00	(FERC 0077)	4.5-187
4.5-33	Bundle 10 - Potter Valley Special-Status Plant Species That	
	Occur or Potentially Could Occur Within the Potter Valley Project	4 5 404
4 5 0 4	(FERC 0077)	4.5-191
4.5-34	Bundle 11 South Yuba–Bear River Vegetation Communities	4 5 407
4 5 05	Associated With the Drum-Spaulding Project (FERC 2310)	4.5-197
4.5-35	Bundle 11 - South Yuba-Bear River Special-Status Wildlife	
	Species That Occur or Potentially Could Occur Within the Drum-Spaulding	4 5 000
4 5 00	Project (FERC 2310)	4.5-200
4.5-36	Bundle 11 - South Yuba River Special-Status Plant Species	
	That Occur or Potentially Could Occur Within the Drum-Spaulding Project	4.5.000
4 5 07	(FERC 2310)	4.5-206
4.5-37	Bundle 12 – Chili Bar Vegetation Communities Associated With	4 7 000
4 5 00	the Chili Bar Project (FERC 2155)	4.5-209
4.5-38	Bundle 12 - Chili Bar Special-Status Wildlife Species That	1 E 011
4 5 00	Occur or Potentially Could Occur Within the Chili Bar Project (FERC 2155)	4.5-211
4.5-39	Bundle 12 - Chili Bar Special-Status Plant Species That Occur	

Table	Page
) (FEDC 9177)
or Potentially Could Occur Within the Chili Bar P	
4.5-40 Local Policies Associated With the Motherlode Re	S .
4.5-41 Bundle 13 - Mokelumne River Vegetation Commu With the Mokelumne River Project (FERC 0137)	4.5-229
4.5-42 Bundle 13 - Mokelumne River Special-Status Wile	
That Occur or Potentially Could Occur Within the	
(FERC 0137)	4.5-235
4.5-43 Bundle 13 – Mokelumne River Special-Status Plan	
That Occur or Potentially Could Occur Within the	
(FERC 0137)	4.5-242
4.5-44 Bundle 14 – Stanislaus River Vegetation Commun	
Associated With the Spring Gap–Stanislaus Project	
Phoenix Project (FERC 1061)	4.5-245
4.5-45 Bundle 14 – Stanislaus River Special-Status Wildl	ife Species
That Occur or Potentially Could Occur Within the	e Spring Gap-Stanislaus
Project (FERC 2130) and the Phoenix Project (FE	
4.5-46 Bundle 14 – Stanislaus River Special-Status Plant	
That Occur or Potentially Could Occur Within the	
Project (FERC 2130) and Phoenix Project (FERC	
4.5-47 Bundle 15 – Merced River Vegetation Communiti	
Merced Falls Project (FERC 2467)	4.5-260
4.5-48 Bundle 15 – Merced River Special-Status Wildlife	
That Occur or Potentially Could Occur Within the	· · · · · · · · · · · · · · · · · · ·
(FERC 2467) 4.5-49 Bundle 15 – Merced Falls Special-Status Plant Sp	4.5-261
Occur or Potentially Could Occur Within the Mer	
(FERC 2467)	4.5-264
4.5-50 Local Policies for the Kings Crane-Helms Regions	
4.5-51 Bundle 16 – Crane Valley Vegetation Communitie	
With the Crane Valley Project (FERC 1354)	4.5-278
4.5-52 Bundle 16 - Crane Valley Special-Status Wildlife	
Occur or Potentially Could Occur Within the Cran	
(FERC 1354)	4.5-280
4.5-53 Bundle 16 - Crane Valley Special-Status Plant Sp	
Occur or Potentially Could Occur Within the Crai	
(FERC 1354)	4.5-284
4.5-54 Bundle 17 – Kerckhoff Vegetation Communities A	
With the Kerckhoff Project (FERC 0096)	4.5-286
4.5-55 Bundle 17 – Kerckhoff Special-Status Wildlife Sp	
or Potentially Could Occur Within the Kerckhoff	
4.5-56 Bundle 17 – Kerckhoff Special-Status Plant Specia	
or Potentially Could Occur Within the Kerckhoff	
4.5-57 Bundle 18 – Kings River Vegetation Communities the Helms Pump-Storage Project (FERC 2735)	4.5-295
4.5-58 Bundle 18 – Kings River Vegetation Communities	
the Haas-Kings River Project (FERC 1998)	4.5-296
4.5-59 Bundle 18 – Kings River Vegetation Communities	
the Balch Project (FERC 0175)	4.5-297
• • • • • • • • • • • • • • • • • • • •	

<u>Table</u>		<u>Page</u>
4.5-60	Wildlife Species Diversity Predicted to Occur Within Broad Elevation Bands in the Kings River Drainage (As Measured by Number of Different Species)	4.5-300
4.5-61	Bundle 18 – Kings River Special-Status Wildlife Species That Occur or Potentially Could Occur Within the Helms Pumped Storage Project (FERC 2735); Haas-Kings River Project (FERC 1998); and Balch Project (FERC 0175)	4.5-301
	(i Lite 0170)	4.5-501
4.5-62	Bundle 18 – Kings River Special-Status Plant Species That Occur or Potentially Could Occur Within the Helms Pumped Storage Project (FERC 2735); Haas-Kings River Project (FERC 1988); and Balch Project (FERC 0175)	4.5-306
4 5-63	Bundle 19 – Tule River Vegetation Communities Associated	4.3-300
	With the Tule River Project (FERC 1333 Wildlife Species Diversity Predicted to Occur Within the Tule	4.5-309
4.5-65	River Project (As Measured By Number of Different Species) Bundle 19 – Tule River Special-Status Wildlife Species That	4.5-311
	Occur or Potentially Could Occur Within the Tule River Project (FERC 1333) Bundle 19 – Tule River Special-Status Plant Species That Occur	4.5-312
	or Potentially Could Occur Within the Tule River Project (FERC 1333)	4.5-316
	Bundle 20 – Kern Canyon Vegetation Communities Associated With the Kern Canyon Project (FERC 0178)	4.5-319
	Bundle 20 – Kern Canyon Special-Status Species That Occur or Potentially Could Occur Within the Kern Canyon Project (FERC 0178) Bundle 20 – Kern Canyon Special-Status Plant Species That Occur	4.5-320
4.5-05	or Potentially Could Occur Within the Kern Canyon Project (FERC 0178)	4.5-322
	VOLUME 5	
4.6	Recreation	
4.6-1	Pacific Gas and Electric Company Hydroelectric Licenses Within	
	the Shasta Regional Bundle	4.6-5
4.6-2	Hat Creek 1 and 2 Recreational Facilities	4.6-7
4.6-3	Pit 1 Recreational Facilities	4.6-11
4.6-4	Pit 3, 4, and 5 Recreational Facilities	4.6-14
4.6-5	McCloud-Pit License Recreational Facilities	4.6-19
4.6-6	Kilarc-Cow Creek Recreational Facilities	4.6-24
4.6-7	Battle Creek Recreational Facilities	4.6 - 26
4.6-8	PG&E Co. Hydroelectric Licenses within the DeSabla Regional Bundle	4.6-30
4.6-9	Upper North Fork Feather River Recreational Facilities	4.6-32
	Rock Creek-Cresta Recreational Facilities	4.6-41
4.6-11	Bucks Creek Recreational Facilities	4.6-44
	DeSabla-Centerville Recreational Facilities	4.6-49
	PG&E Co. Hydroelectric Licenses within the Drum Regional Bundle	4.6-54
	Potter Valley Recreational Facilities	4.6-58
	Drum-Spaulding Recreational Facilities	4.6-66
	Pacific Gas and Electric Company Hydroelectric Licenses within	

<u>Table</u>		<u>Page</u>
	the Motherlode Regional Bundle	4.6-89
	Mokelumne River Recreational Facilities	4.6-94
	Spring Gap-Stanislaus Recreational Facilities	4.6-111
	Merced Falls Recreational Facilities	4.6-124
4.6-20	Bass Lake Recreational Facilities – Capacities and Use	4.6-136
	Group Campground Sites at Bass Lake	4.6-137
	Family Campground Sites at Bass Lake	4.6-137
	Day Use Sites at Bass Lake	4.6-138
	Bass Lake Historical Surface Elevations	4.6-140
	Summary of Bass Lake Levels	4.6-141
4.6-26	Percentage of Flow Contributed to Horseshoe Bend Reach of	
	the San Joaquin River by Willow Creek (Period of Record = 1953-1997)	4.6-144
	Recreation Use of Kerckhoff Bundle Facilities in 1996	4.6-148
	Recreation Use of Kings River Bundle Facilities in 1996	4.6-153
	Commercial Whitewater Rafting – Kings River	4.6-160
4.6-30	Screening of Potentially Affected Recreation Areas	
	(Reservoirs and Rivers/Streams) in the Shasta Region and DeSabla Region	4.6-172
4.6-31	Screening of Potentially Affected Recreation Areas	
	(Reservoirs and Rivers/Streams) in the Drum Region and Motherlode Region	4.6-179
4.6-32	Screening of Potentially Affected Recreation Areas	
	(Reservoirs and Rivers/Streams) in the Kings Crane-Helms Region	4.6-179
4.6-33		4.6-182
4.6-34	Estimated Main-Season Reductions in Whitewater Recreation	
	Use Levels Under New Project Operational Conditions	4.6-218
4.6-35	Estimates of Potential Whitewater Recreation Activities Under	
	New Project Operational Conditions	4.6-220
4.7	Cultural Resources	
4.7-1	Cultural Resource Sites Within FERC Licensed Areas and	
1., 1	Watershed Lands Associated with the Hat Creek 1 and 2 Hydroelectric Facility	4.7-20
4.7-2	Cultural Resource Sites Within FERC Licensed Areas and	1.7 20
~	Watershed Lands Associated with the Pit 1 Hydroelectric Facility	4.7-21
4.7-3:	Cultural Resource Sites Within FERC Licensed Areas and	~1
1 0.	Watershed Lands Associated with the Pit 3, 4, and 5 Hydroelectric Facility	4.7-23
4.7-3:	Cultural Resource Sites Within FERC Licensed Areas and	277 20
100	Watershed Lands Associated with the Pit 3, 4, and 5 Hydroelectric Facility	4.7-24
4.7-5	Cultural Resource Sites Within FERC Licensed Areas and	211 72
	Watershed Lands Associated with the Kilarc-Cow Creek Hydroelectric Facility	4.7-25
4.7-6	Cultural Resource Sites Within FERC Licensed Areas and	277 20
1	Watershed Lands Associated with the Battle Creek Hydroelectric Facility	4.7-26
4.7-7	Cultural Resource Sites Identified Within FERC Licensed Areas and	277 20
	Watershed Lands Associated with the Upper North Fork Feather River Facility	4.7-28
4.7-8	Cultural Resource Sites Identified Within FERC Licensed Areas	277 20
2 0	and Watershed Lands Associated with the Rock Creek-Cresta Facility	4.7-30
4.7-9	Cultural Resource Sites Identified Within FERC Licensed Areas	2 00
2	And Watershed Lands Associated with the Poe Facility	4.7-32
4.7-10	Cultural Resource Sites Identified Within FERC Licensed Areas	
0	and Watershed Lands Associated with the Bucks Creek Facility	4.7-33

<u>Table</u>		<u>Page</u>
4.7-11	Cultural Resource Sites Identified Within FERC Licensed Areas	
	and Watershed Lands Associated with the DeSabla-Centerville Facility	4.7-34
4.7-12	Cultural Resource Sites Identified Within Watershed Lands	
	Associated with the Coal Canyon Powerhouse	4.7-35
4.7-13	Cultural Resources Identified Within FERC Licensed Areas	
	and Watershed Lands Associated with the Narrows Hydroelectric Facility	4.7-37
4.7-14	Cultural Resources Identified Within FERC Licensed Areas	
	and Watershed Lands Associated with the Potter Valley Hydroelectric Facility	4.7-38
4.7-15	Cultural Resources Identified Within FERC Licensed Areas and	
	Watershed Associated with the Drum-Spaulding Hydroelectric Facility	4.7-39
4.7-16	Cultural Resources Identified Within FERC Licensed Areas and	
	Watershed Lands Associated with the Mokelumne River Hydroelectric Facility	4.7-42
4.7-17	Cultural Resources Identified Within FERC Licensed Areas and Watershed Land	
	Associated with the Spring Gap-Stanislaus Hydroelectric Facility	4.7-46
4.7-180	Cultural Resources Identified Within FERC Licensed Areas and Watershed Association	
	the Phoenix Hydroelectric Facility	4.7-48
4.7-19	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	
	Associated with the Crane Valley Hydroelectric Facility	4.7-52
4.7-20	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands
	Associated with The Kerckhoff Hydroelectric Facility	4.7-57
4.7-21	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands
	Associated with the Helms Hydroelectric Facility	4.7-58
4.7-22	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands
	Associated with the Haas-Kings River Hydroelectric Facility	4.7-59
4.7-23:	: Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands
	Associated with the Balch Hydroelectric Project	4.7-62
4.7-24	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands of
	the Tule River Hydroelectric Facility	4.7-65
4.7-25	Cultural Resource Sites Identified Within FERC Licensed Areas and Watershed	Lands
	Associated with the Kern Canyon Hydroelectric Facility	4.7-66
4.8	Agriculture	
4.8-1	Pacific Gas & Electric Company-Owned Land Used for Agriculture	4.8-6
4.8-2	Estimated Acres and Irrigation Requirements for Agriculture	
	Within Each Regional Bundle	4.8-8
4.8-3	Agricultural Land in Shasta Regional Bundle	4.8-9
4.8-4	Total Water Storage Capacity of Shasta Regional Bundle	4.8-11
4.8-5	Bundle 1 Agricultural Leases	4.8-12
4.8-6	Bundle 2 Agricultural Leases	4.8-12
4.8-7	Bundle 3 Agricultural Leases	4.8-13
4.8-8	Bundle 4 Agricultural Leases	4.8-14
4.8-9	Agricultural Land in DeSabla Regional Bundle	4.8-15
4.8-10	Total Water Storage Capacity of DeSabla Regional Bundle	4.8-17
	Bundle 5 Agricultural Leases	4.8-18
	Bundle 6 Agricultural Leases	4.8-20
	Bundle 8 Agricultural Leases	4.8-21
	Water Delivery Agreements in Bundle 8	4.8-22
4.8-15	Agricultural Land in Drum Regional Bundle	4.8-23

<u>Table</u>		<u> Page</u>
	Total Water Storage Capacity of Western Drum Regional Bundle	4.8-27
	Bundle 10 Agricultural Leases	4.8-27
	Total Water Storage Capacity of Eastern Drum Regional Bundle	4.8-29
	Bundle 11 Agricultural Leases	4.8-29
	Agricultural Land in the Motherlode Regional Bundle	4.8-30
	Bundle 13 Associated Agricultural Leases	4.8-33
	Bundle 14 Associated Agricultural Leases	4.8-34
4.8-23	Agricultural Land in Kings Crane-Helms Regional Bundle	4.8-36
4.8 - 24	Bundle 17 Associated Agricultural Leases	4.8-37
4.8 - 25	Agricultural Leases in Shasta Regional Bundle	
	Having Development Potential	4.8-40
4.8 - 26	Agricultural Leases in DeSabla Regional Bundle	
	Having Development Potential	4.8-40
4.8 - 27	Agricultural Leases in Drum Regional Bundle	
	Having Development Potential	4.8-40
4.8-28	Agricultural Gross Revenue by County 1989–1998	4.8-42
4.8-29	Project Water Available for Downstream Agriculture	4.8-44
	VOLUME 6	
4.9	Hazards and Hazardous Materials	
4.9-1	Summary of Federal and State Laws and Regulations Relating to Hazards	4.9-3
4.9-2	Frequency of DSOD Dam Safety Inspections	4.9-9
4.9-3	Typical Water Conveyance Facilities Service Lives and Maintenance Activities	4.9-10
4.9-4	Dams in the Hat Creek 1 and 2 Project (FERC 2661)	4.9 - 26
4.9-5	Dams in the Pit 1 Project (FERC 2687)	4.9-29
4.9-6	Theoretical Effects of a Dam Failure – Pit 1 Project (FERC 2687)	4.9 - 29
4.9-7	Dams in the Pit 3, 4, and 5 Project (FERC 0233)	4.9-31
4.9-8	Theoretical Effects of a Dam Failure – Pit 3, 4, and 5 Project (FERC 0233)	4.9-32
4.9-9	Dams in the McCloud-Pit Project (FERC 2106)	4.9-36
	Theoretical Effects of a Dam Failure – McCloud-Pit Project (FERC 2106)	4.9-37
	Dams in the Kilarc-Cow Creek Project (FERC 0606)	4.9-40
	Dams in the Battle Creek Project (FERC 1121)	4.9-42
	Theoretical Effects Of A Dam Failure – Battle Creek Project (FERC 1121)	4.9-43
	Dams in the Hamilton Branch Project (non-FERC)	4.9-47
	Dams in the Upper North Fork Feather River Project (FERC 2105)	4.9-49
4.9-16	Theoretical Effects of a Dam Failure –	
	Upper North Fork Feather River Project (FERC 2105)	4.9 - 49
	Dams in the Rock Creek-Cresta Project (FERC 1962)	4.9-57
4.9-18	Theoretical Effects of a Dam Failure –	
	Rock Creek-Cresta Project (FERC 1962)	4.9-58
4.9-19	Dams in the Poe Project (FERC 2107)	4.9-61
	Dams in the Bucks Creek Project (FERC 0619)	4.9-63
4.9-21	Theoretical Effects of a Dam Failure – Bucks Creek Project (FERC 0619)	4.9-64
4.9-22	Dams in the DeSabla-Centerville Project (FERC 0803)	4.9-68
	Dams in the Lime Saddle Project (non-FERC)	4.9-71
	Dams In the Potter Valley Project (FERC 0077)	4.9-77
	Theoretical Effects of a Dam Failure –	

Table		Page
	Scott Dam, Potter Valley Project (FERC 0077)	4.9-78
4.9-26	Dams in the Drum-Spaulding Project (FERC 2310)	4.9-81
	Theoretical Effects of a Dam Failure –	
	Drum-Spaulding Project (FERC 2310)	4.9-82
4.9-28	Dams in the Chili Bar Project (FERC 2155)	4.9-92
	Theoretical Effects of a Dam Failure – Chili Bar Dam (FERC 2155)	4.9-92
	Dams in the Mokelumne River Project (FERC 0137)	4.9-96
4.9-31	Theoretical Effects of a Dam Failure –	
	Mokelumne River Project (FERC 0137)	4.9 - 97
4.9 - 32	Dams in the Spring Gap-Stanislaus Project (FERC 2130)	4.9-102
4.9 - 33	Theoretical Effects of a Dam Failure –	
	Spring Gap-Stanislaus Project (FERC 2130)	4.9-103
4.9 - 34	Dams in the Phoenix Project (FERC 1061)	4.9-106
4.9 - 35	Theoretical Effects of a Dam Failure –	
	Lyons Dam, Phoenix Project (FERC 1061)	4.9-106
	Dams in the Merced Falls Project (FERC 2467)	4.9-109
4.9 - 37	Theoretical Effects of a Dam Failure –	
	Merced Falls Dam, Merced Falls Project (FERC 2467)	4.9-109
4.9 - 38	Dams in the Crane Valley Project – FERC 1354	4.9-113
4.9 - 39	Theoretical Effects of a Dam Failure – Crane Valley Project – FERC 1354	4.9-113
	Dams in the Kerckhoff Project – FERC 0096	4.9-117
	Dams in the Balch Project – FERC 0175	4.9-120
	Theoretical Effects of a Dam Failure – Balch Project (FERC 0175)	4.9-121
4.9-43	Dams in the Haas-Kings River Project (FERC 1988)	
	and Helms Pumped-Storage Project (FERC 2735)	4.9-124
4.9-44	Theoretical Effects of a Dam Failure – Haas-Kings River	
	Project (FERC 1988) and Helms Pumped-Storage Project (FERC 2735)	4.9-124
	Dams in the Tule River Project – FERC 1333	4.9-130
	Dams in the Kern Canyon Project – FERC 0178	4.9-132
	Summary of Site Contamination Potential – Shasta Regional Bundle	4.9-141
	Summary of Site Contamination Potential – DeSabla Regional Bundle	4.9-142
	Summary of Site Contamination Potential – Drum Regional Bundle	4.9-144
	Summary of Site Contamination Potential – Motherlode Regional Bundle	4.9-145
4.9-49	Summary of Site Contamination Potential –	
	Kings Crane-Helms Regional Bundle	4.9-146
4.9-50	Water Conveyance Facility Failures Occurring over the Past 10 Years	4.0.450
	& FERC License Conditions Specifying Standards for Maintenance	4.9-156
4.10	Population, Employment, and Housing	4.40.0
4.10-1	Shasta Regional Bundle Population	4.10-3
4.10-2	Shasta Regional Bundle Housing	4.10-4
4.10-3	Employment Within Shasta Regional Bundle	4.10-4
4.10-4	Shasta Regional Bundle Population Projections	4.10-5
4.10-5	DeSabla Regional Bundle Population	4.10-6
4.10-6	DeSabla Regional Bundle Housing	4.10-6
4.10-7	DeSabla Regional Bundle Employment	4.10-7
4.10-8	DeSabla Regional Bundle Projections	4.10-8

<u>Table</u>		Page
4 10 0		4.40.0
4.10-9	Drum Regional Bundle Population	4.10-8
4.10-10	Drum Regional Bundle Housing	4.10-9
4.10-11	Drum Regional Bundle Employment	4.10-9
4.10-12	Drum Regional Bundle Projections	4.10-10
4.10-13	Motherlode Regional Bundle Population	4.10-11
4.10-14	Motherlode Regional Bundle Housing	4.10-11
4.10-15	Motherlode Regional Bundle Employment	4.10-12
4.10-16	Motherlode Regional Bundle Population Projections	4.10-12
4.10-17	Kings Crane-Helms Regional Bundle Population	4.10-13
4.10-18	Kings Crane-Helms Regional Bundle Housing	4.10-14
4.10-19	Kings Crane-Helms Regional Bundle Employment	4.10-14
4.10-20	Kings Crane-Helms Population Projections	4.10-15
4.10-21	Population Projections for the Shasta Regional Bundle	4 10 17
4 10 99	Based on Development Potential	4.10-17
4.10-22	Shasta Regional Bundle Projected Population Increase	4 10 17
4 10 99	Based on Development Potential	4.10-17
4.10-23	Population Projections for the DeSabla Regional Bundle	4 10 10
4 10 94	Based on Development Potential	4.10-18
4.10-24	DeSabla Regional Bundle Projected Population Increase	4 10 10
4 10 95	Based on Development Potential	4.10-19
4.10-25	Drum Regional Bundle Population Projections	4 10 10
4 10 96	Based on Development Potential	4.10-19
4.10-26	Drum Regional Bundle Projected Population Increase	4 10 90
4 10 97	Based on Development Potential	4.10-20
4.10-27	Motherlode Regional Bundle Population Projections	4 10 90
4 10 90	Based on Development Potential Methodology Regional Provide Projected Population Increase	4.10-20
4.10-28	Motherlode Regional Bundle Projected Population Increase	4.10-21
4 10 90	Based on Development Potential Vinga Crana Halma Pagional Pundle Population Projections	4.10-21
4.10-29	Kings Crane-Helms Regional Bundle Population Projections	4.10-21
4.10-30	Based on Development Potentia1	4.10-21
4.10-30	Kings Crane-Helms Projected Population Increase Based on Development Potential	4.10-22
	Dased on Development Potential	4.10-22
4.11 I	Public Services and Utilities	
4.11-1	Pacific Gas and Electric Company Hydroelectric Power Units	
1.11 1	on RMR Contracts	4.11-3
4.11-2	Provision of Water Supplies to Areas with Potential for	1.11 0
~	Equivalent Development Units by Land Area	4.11-31
4.11-3	Estimated Taxes Paid By the Pacific Gas and Electric Company	1.11 01
1.11 0	(Systemwide), 1999/2000	4.11-47
4.11-4	Public Service and Utility Providers in the	1.11 17
1.11 1	Shasta Regional Bundle Land Areas	4.11-53
4.11-5	USFS Road Maintenance Agreements in the Shasta Regional Bundle	4.11-54
4.11-5	USFS Road Maintenance Agreements in the Shasta Regional Bundle	4.11-55
4.11-7	Assessments and Property Taxes for Shasta Regional Bundle	4.11-55
4.11-8	Public Service and Utility Providers in the	1.11 00
	DeSabla Regional Bundle Land Areas	4.11-57
4.11-9	DeSabla Regional Bundle Road Maintenance Requirements	4.11-59
-	0	

<u>Table</u>		<u> Page</u>	_
4 11 10	Design Con and Electric Common Hadron lectric Access		
4.11-10	Pacific Gas and Electric Company Hydroelectric Assets	4 11 60	
4.11-11	Valuation by County, 1998 Assessments and Proporty Toyon for DeSable Regional Bundle	4.11-60 4.11-60	
	Assessments and Property Taxes for DeSabla Regional Bundle Public Service and Utility Providers in the	4.11-00	
4.11-12		1 11 69	
1 11 19	Drum Regional Bundle Land Areas	4.11-62 4.11-64	
	Drum Regional Bundle Road Maintenance Requirements Pacific Gas and Electric Company Hydroelectric Assets	4.11-04	
4.11-14	1 0 0	A 11 GA	
1 11 15	Valuation by County, 1998	4.11-64 4.11-65	
4.11-15	1 0	4.11-05	
4.11-10	Public Service and Utility Providers in the	4.11-66	
1 11 17	Motherlode Regional Bundle Land Areas	4.11-00	
4.11-17	Pacific Gas and Electric Company Hydroelectric Assets	A 11 67	
A 11 10	Valuation By County, 1998 Assessments and Proposty Toyon for Methoplede Regional Bundle	4.11-67 4.11-67	
	Assessments and Property Taxes for Motherlode Regional Bundle Public Service and Utility Providers in the	4.11-07	
4.11-19	Kings Crane-Helms Regional Bundle Land Areas	4.11-69	
4 11 9N		4.11-09	
4.11-20	Kings Crane-Helms Regional Bundle Road Maintenance Requirements for Roads Under Permit with USFS	4.11-70	
4.11.21		4.11-70	
4.11.21	Pacific Gas and Electric Company Hydroelectric Assets	4.11-70	
1 11 99	Valuation by County, 1998/1999	4.11-70	
4.11-22	Assessments and Property Taxes for	1 11 70	
1 11 99	Kings Crane-Helms Regional Bundle	4.11-70 4.11-74	
4.11-23	Development Potential in the Shasta Regional Bundle		
4.11-24	1	4.11-77	
4.11-25		4.11-80	
4.11-26	Development Potential in the Motherlode Regional Bundle	4.11-82	
4.11-27 4.11-28	Development Potential in the Kings Crane-Helms Regional Bundle Interim Telecom Services Matrix	4.11-85	
4.11-28	interini Teleconi Services Matrix	4.11-100	
	Fransportation		
4.12-1	Public Roads Within The Shasta Regional Bundle	4.12-4	
4.12-2	Public Roads within the DeSabla Regional Bundle	4.12-10	
4.12-3	Public Roads Within the Drum Regional Bundle	4.12-16	
4.12-4	Public Roads Within the Motherlode Regional Bundle	4.12-23	
4.12-5	Public Roads Within the Kings Crane-Helms Regional Bundle	4.12-29	
4.12-6	Roadway Classification System	4.12-35	
4.12-7	Development Potential Traffic Impacts for Shasta Regional Bundle	4.12-37	
4.12-8	Development Potential Traffic Impacts for DeSabla Regional Bundle	4.12-38	
4.12-9	Development Potential Traffic Impacts for Drum Regional Bundle	4.12-39	
4.12-10	Development Potential Traffic Impacts for Motherlode Regional Bundle	4.12-40	
4.12-11	Development Potential Traffic Impacts for		
	Kings Crane-Helms Regional Bundle	4.12-41	
4.12-12	Roads That Could Disrupt Travel Patterns in the		
	Shasta Regional Bundle	4.12-44	
4.12-13	Roads that Could Disrupt Travel Patterns in the		
	DeSabla Regional Bundle	4.12-45	
4.12-14	Roads That Could Disrupt Travel Patterns In the		
	Drum Regional Bundle	4.12-45	

<u>Table</u>		Page
4.12-15	Roads that Could Disrupt Travel Patterns in the	
	Motherlode Regional Bundle	4.12-46
4.12-16	Roads that Could Disrupt Travel Patterns in the	
	Kings Crane-Helms Regional Bundle	4.12-46
4.40	NT •	
	Noise	
4.13-1	Summary of Noise Levels Identified as Requisite to Protect	4 10 4
1 10 0	Public Health and Welfare With an Adequate Margin of Safety	4.13-4
4.13-2 4.13-3	OSHA Worker Noise Exposure Standards	4.13-4 4.13-6
4.13-3	Land Use Compatibility for Community Noise Environment Shasta Regional Bundle Residential and Recreational Receptors	4.13-8
4.13-4	DeSabla Regional Bundle Residential and Recreational Receptors	4.13-10
4.13-6	Drum Regional Bundle Residential and Recreational Receptors	4.13-10
4.13-7	Motherlode Regional Bundle Residential and Recreational Receptors	4.13-12
4.13-8	King Crane-Helms Regional Bundle Residential and Recreational Receptors	4.13-14
1.10 0	Tring Orano Tremis receptors	1.10 11
4.14 A	Air Quality	
4.14-1	Air Basins Affected by the Proposed Project	4.14-2
4.14-2	National and California Ambient Air Quality Standards	4.14-6
4.14-3	Summary of Health Effects of the Major Criteria Pollutants	4.14-7
4.14-4	Climate Data For the Shasta Regional Bundle Projects	4.14-9
4.14-5	Attainment Status of Counties within the Shasta Regional Bundle	4.14-9
4.14-6	Climate Data For the DeSabla Regional Bundle Project	4.14-12
4.14-7	Attainment Status of Counties within the DeSabla Regional Bundle	4.14-13
4.14-8	Climate Data For the Drum Regional Bundle	4.14-16
4.14-9	Attainment Status of Counties within the Drum Regional Bundle	4.14-17
4.14-10	Climate Data For the Motherlode Regional Bundle	4.14-19
4.14-11	Attainment Status of Counties within the Motherlode Regional Bundle	4.14-20
4.14-12	Climate Data For the Kings Crane-Helms Regional Bundle	4.14-22
4.14-13	Attainment Status of Counties within the	
	Kings Crane-Helms Regional Bundle	4.14-23
4.14-14	Emission Significance Thresholds Summary	4.14-24
4.14-15	Amador County APCD Emission Significance Thresholds Summary	4.14-25
4.14-16	FRAQMD Indirect Source Project Size Significance Thresholds Summary	4.14-26
4.14-17	Northern Sierra AQMD Emission Significance Thresholds Summary	4.14-28
4.14-19	Areas With Known Potential For Mineral Extraction	4.14-32
4.14-20	Emission Source General Assumption	4.14-32
4.14-21	Emission Estimation Factor Sources	4.14-36
4.14-22	SERASYM ^M Modeled California Thermal Power Plant Emissions	1 11 20
4.14-23	(Using Water Years 1975-1998) SERASYM™ Modeled California Thermal Power Plant Emissions	4.14-38
4.14-23	(August Emissions Using Water Years 1977, 1979 and 1998)	4.14-40
1 11 916	a) Shasta Regional Bundle Development Emissions Summary	4.14-40
	b) Shasta Regional Bundle Development Emissions Summary	4.14-43 4.14-44
	a) DeSabla Regional Bundle Development Emissions Summary	4.14-44 4.14-46
	b) DeSabla Regional Bundle Development Emissions Summary	4.14-40 4.14-47
	a) Drum Regional Bundle Development Emissions Summary	4.14-47
	b) Drum Regional Bundle Development Emissions Summary	4.14-50
	.,	

<u>Table</u>	ZIST OT TREED (COMMITTEED)	Page
4.14-27 4.14-28	7(a) Motherlode Regional Bundle Development Emissions Summary 7(b) Motherlode Regional Bundle Development Emissions Summary 8(a) Kings Crane-Helms Regional Bundle Development Emissions Summary 8(b) Kings Crane-Helms Regional Bundle Development Emissions Summary	4.14-53 4.14-54 4.14-56 4.14-57
	VOLUME 7	
4.16	Geology, Soils, and Mineral Resources	
4.16-1	Approximate Relationships Between Earthquake Magnitude and Intensity Modified Mercalli Scale Of Earthquake Intensity	4.16-14 4.16-17
5.	ADDITONAL CEQA CONSIDERATIONS	
5.1	Growth Inducing Effects	
5-1	Potential Growth-Inducing Impacts from Project Land Development	£ 1 9
5-2	in Shasta Region Potential Growth-inducing Impacts from Project Land Development	5.1-2
0 2	in DeSabla Region	5.1-3
5-3	Potential Growth-Inducing Impacts from Project Land Development	
	in Drum Region	5.1-4
5-4	Potential Growth-Inducing Impacts from Project Land Development	T 1 0
5-5	in Motherlode Region Potential Growth-inducing Impacts from Project Land Development	5.1-6
J-J	in Kings Crane-Helms Region	5.1-7
5-6	Consumptive Water Supply Delivered Under Expired,	0.1 7
	Six-Month or Less Terminable, or 15-Year or Less Expiring Agreements	5.4-47
5.4	Cumulative Impacts	F 774
5-7	Cumulative Projects	5-71
6	ALTERNATIVES	
6-1	Alternative 1: No Project (A) Pacific Gas and Electric Company Regulated	6-16
6-2	Alternative 2: No Project (B) Pacific Gas and Electric Company Unregulated	6-17
6-3	Illustrative Increased Instream Flows Alternative 3 (Proposed Settlement)	6-20
6-4	Alternative 3: Pacific Gas and Electric Company Proposed Settlement	6-21
6-5	Alternative 4: Proposed Settlement (Regulated)	6-23
6-6	Potential Bundling of Hydroelectric Facilities by River Basin	6-24
6-7	Alternative 5: Bundled by River Basin (16 Bundles)	6-25
6-8	Alternative 6: Individual Projects (29 Bundles)	6-27
6-9	Bundles Most Likely to be Purchased and Operated for Water Supply Purposes Watershed Lands Available for Conservation	6-28 6-29
6-10 6-11	Alternative 7: Bundle Lands for Conservation	6-29 6-30
6-12	Alternative 8: Decommissioning of Selected Facilities	6-35
6-13	Alternative 9: Environmental Composite	6-36
6-14	Focused Alternative 1: Single Owner (not Pacific Gas and Electric Company)	6-48
6-15	Focused Alternative 2: Individual Bundles Removed from Regional Bundles	6-49

<u>Table</u>		<u> Page</u>
6-16	Projects Auctioned or Retained in the Interim	6-51
6-17	Focused Alternative 3: Partial/Interim Retention of Selected Facilities	6-52
6-18	Focused Alternative 4: Environmental Enhancement	6-54
6-19	Focused Alternative 5: Alternative Valuation -	
	Negotiated Sale of Selected Facilities	6-55
6-20	Focused Alternative 6: Interim State Ownership	6-57
6-21	Focused Alternative 7: Alternate Ratemaking (Performance-Based Regulated)	6-59
6-22	Baseline (or Environmental Setting)	6-60
6-23	Proposed Project	6-61
6-24	Comparison of the Proposed Project and Alternatives	6-62
6-25	Comparison of Baseline to Alternative 1 (No Project A)	6-63
6-26	Comparison of the Proposed Project to Alternatives 2 (No Project B), 5	
	(Bundled by Watershed) and 6 (Individual Bundles)	6-64
6-27	Comparison of the Proposed Project to Focused Alternatives 1 (Single Owner),	
	2 (Bundles Minus Facilities), 5 (Alternative Valuation),	
	and 7 (Alternate Ratemaking)	6-65
6-28	Comparison of Alternatives 3 and 4 (Proposed Settlement), 7 (Land	
	Conservation), 9 (Environmental Composite) and Focused Alternative 4	
	(Environmental Enhancement)	6-67
6-29	Comparison of Focused Alternative 3 (Interim Retention) to Baseline	
	and the Project	6-68
6-30	Comparison of Focused Alternative 6 (Interim State Ownership	
	[and Future Divestiture]) to Alternative 3 (Settlement) and	
	Alternative 9 (Environmental Composite)	6-70
6-31	Potential Environmental Effects from Changed Hydroelectric Operations	6-73
6-32	Potential Environmental Effects from Land Management and Development	6-74
6-33	Potential Environmental Effects from Discontinuation of	
	Non-Binding Agreements	6-75
6-34	Comparison of Alternative Assumptions	6-76
6-35	SERASYM™ Modeled California Thermal Power Plant Emissions	
	(using water years 1975-1998)	6-88
6-36	Conditions Under Which Ownership of Realistic Amounts of	
	Thermal Capacity Made Month-Long "Baseload" Hydro Shifting Pay Off	6-127
6-37	Comparison of the Impacts of the Alternatives	6-133
6-38	Comparison of the Impacts of the Focused Alternatives	6-143

LIST OF FIGURES

<u>Figure</u>	3	Page
EVEC		
	UTIVE SUMMARY	EC 0
ES-1	Pacific Gas and Electric Company Hydroelectric Facilities	ES-3
ES-2	Hydroelectric Developments on the Pit	FC 17
TG 0	and McCloud Rivers and Hat Creek all figures following	ES-17
ES-3	Hydroelectric Developments on Cow and Battle Creeks	
ES-4	Hydroelectric Developments on the Butte Creek and North Fork Feather River	
ES-5	Hydroelectric Developments on the Yuba, Bear, and American Rivers	
ES-6	Hydroelectric Developments on the Eel River and East Fork of Russian River	
ES-7	Hydroelectric Developments on the North Fork Mokelumne River	
ES-8	Hydroelectric Developments on the South, Middle and North Forks of Stanislaus	
ES-9	Hydroelectric Developments on the San Joaquin River	
ES-10	Hydroelectric Developments on the Kings River	
2.	PROJECT DESCRIPTION	
2-1	Pacific Gas & Electric Company Hydroelectric Facilities	2-3
2-2	Typical Features of a Hydroelectric Plant	2-9
2-3	Project Assets: Tunnel from McCloud to Iron Canyon (above),	
	Iron Canyon Reservoir (below), Shasta Regional Bundle	2-11
2-4	Project Assets: Penstocks leading to Pit 5 Powerhouse (left),	
	Pit River below Lake Britton (right), Shasta Regional Bundle	2-13
2-5	Project Assets: Bucks Creek Powerhouse (above),	
	Rock Creek Dam (below), DeSabla Regional Bundle	2-15
2-6	Project Assets: Mountain Meadow Reservoir (above),	
	Water Conveyance Pipes to Cresta Powerhouse (below),	
	DeSabla Regional Bundle	2-17
2-7	Project Assets: Cape Horn Dam (above), Van Arsdale Reservoir (below),	
	Drum Regional Bundle	2-19
2-8	Project Assets: Potter Valley Fish Ladder (left),	
	Potter Valley Penstock, Drum Regional Bundle	2-21
2-9	Project Assets: Tiger Creek Powerhouse (above),	
	Lower Bear River Reservoir (below), Motherlode Regional Bundle	2-23
2-10	Project Assets: Mokelumne River (above and below),	
	Motherlode Regional Bundle	2-25
2-11	Project Assets: Kern Canyon Powerhouse (above), Wishon Reservoir (below),	
	Kings Crane-Helms Regional Bundle	2-27
2-12	Project Assets: Crane Valley Powerhouse (left), Balch Afterbay Dam (right),	
	Kings Crane-Helms Regional Bundle	2-29
2-13	Helms Pump Storage Facility	2-32
2-14	Schematic Diagram of How the ISO Works	2-40
2-15	Depiction of Land Assets	2-51
2-16	Hydroelectric Developments on the Pit and McCloud Rivers and Hat Creek	2-55
2-17	Hydroelectric Developments on Cow and Battle Creeks	2-57
2-18	Shasta Regional Bundle	2-59
2-19	Hydroelectric Developments on the Butte Creek and North Fork Feather River	2-73
2-20	DeSabla Regional Bundle	2-75
2-21	Hydroelectric Developments on the Yuba, Bear, and American Rivers	2-89
2-22	Hydroelectric Developments on the Eel River and East Fork of Russian River	2-91

<u>Figur</u>	e	Page
2-23	Drum Regional Bundle (Spaulding)	2-93
2-24	Drum Regional Bundle (Potter Valley)	2-95
2-25	Hydroelectric Developments on the South, Middle and North Forks of Stanislaus	
2-26	Hydroelectric Developments on the North Fork Mokelumne River	2-109
2-27	Motherlode Regional Bundle	2-111
2-28	Hydroelectric Developments on the San Joaquin River	2-121
2-29	Hydroelectric Developments on the Kings River	2-123
2-30	Kings Crane-Helms Regional Bundle	2-125
2-31	Kings Crane-Helms Regional Bundle	2-127
3.	APPROACH TO ENVIRONMENTAL ANALYSIS	
3-1	Annual Hydropower Generation	3-28
3-2	Average Monthly Hydropower Flows	3-29
3-3	Monthly Powerhouse Flows vs. Historic Pattern	3-30
3-4	Monthly Powerhouse Flows vs. Baseline Case	3-31
3-5	Total PG&E Pit-McCloud System Storage	3-32
3-6	Total PG&E NF Feather River System Storage	3-33
3-7	Total PG&E Drum-Spaulding System Storage	3-34
3-8	Total Lake Pillsbury Reservoir Storage	3-35
3-9	Total PG&E Mokelumne River System Storage	3-36
3-10	Total PG&E Stanislaus River System Storage	3-37
3-11	Total PG&E Crane-Kerckhoff System Storage	3-38
3-12	Land Areas Shasta Regional Bundle	3-49
3-13	Land Areas DeSabla Regional Bundle	3-53
3-14	Land Areas Drum Regional Bundle	3-61
3-15	Land Areas Drum Regional Bundle	3-63
3-16	Land Areas Motherlode Regional Bundle	3-73
3-17	Land Areas Kings Crane-Helms Regional Bundle	3-79
3-18	Land Areas Kings Crane-Helms Regional Bundle	3-81
3-19	Timber Harvest Assumptions Shasta Regional Bundle (Local Bundle 2)	3-98
3-20	Timber Harvest Assumptions Shasta Regional Bundle (Local Bundles 3 & 4)	3-99
3-21	Timber Harvest Assumptions DeSabla Regional Bundle (Local Bundles 5 & 6)	3-100
3-22	Timber Harvest Assumptions DeSabla Regional Bundle	
	(Local Bundles 6, 7 & 8)	3-101
3-23	Timber Harvest Assumptions Drum Regional Bundle (Local Bundle 10)	3-102
3-24	Timber Harvest Assumptions Drum Regional Bundle (Local Bundle 11)	3-103
3-25	Timber Harvest Assumptions Drum Regional Bundle (Local Bundle 13)	3-104
3-26	Timber Harvest Assumptions Motherlode Regional Bundle (Local Bundle 14)	3-105
3-27	Timber Harvest Assumptions Kings Crane-Helms Regional Bundle	
	(Local Bundle 16)	3-106
3-28	Timber Harvest Assumptions Kings Crane-Helms Regional Bundle	
	(Local Bundle 18)	3-107

<u>Figure</u> Page

VOLUME 2

4.	ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES	
4.2	Forestry	
4.2-1	Project Wide Annual Harvest Volume	4.2-6
4.2-2	Statewide Annual Harvest Volume	4.2-8
4.2-3	Annual Harvest Volume, Shasta Regional Bundle	4.2-12
4.2-4	Annual Harvest Volume, DeSabla Regional Bundle	4.2-17
4.2-5	Annual Harvest Volume, Drum Regional Bundle	4.2-22
4.2-6	Annual Harvest Volume, Motherlode Regional Bundle	4.2-26
4.2-7	Annual Harvest Volume, Kings Crane-Helms Regional Bundle	4.2-30
4.3	Hydrology and Water Quality	
4.3-1	Schematic Diagram of the Flow of Water in the	
	Shasta Regional Bundle (Hat Creek and Pit River)	4.3-30
4.3-2	Schematic Diagram of the Flow of Water in the	
	Shasta Regional Bundle (Kilarc-Cow Creek)	4.3-41
4.3-3	Schematic Diagram of the Flow of Water in the	
	Shasta Regional Bundle (Battle Creek)	4.3-44
4.3-4	Schematic Diagram of the Flow of Water in the DeSabla Regional Bundle	
	(Hamilton Branch, North Fork Feather River, and Bucks Creek)	4.3-54
4.3-5	Schematic Diagram of the Flow of Water in the	
	DeSabla Regional Bundle (Butte Creek)	4.3-73
4.3-6	Schematic Diagram of the Flow of Water in the	
	Drum Regional Bundle (North Yuba River)	4.3-78
4.3-7	Schematic Diagram of the Flow of Water in the	-7.5
	Drum Regional Bundle (Eel and East Fork of Russian River)	4.3-82
4.3-8	Schematic Diagram of the Flow of Water in the	-7.5
1.0 0	Drum Regional Bundle (South Yuba-Bear River)	4.3-87
4.3-9	Schematic Diagram of the Flow of Water in the	1.0 0.
1.0 0	Drum Regional Bundle (South Yuba-Bear River continued)	4.3-88
4 3-10	Schematic Diagram of the Flow of Water in the	1.0 00
1.0 10	Drum Regional Bundle (South Fork American River)	4.3-99
4 3 ₋ 11	Schematic Diagram of the Flow of Water in the	1.0 00
1.0 11	Motherlode Regional Bundle (North Fork Mokelumne River)	4.3-104
1 3-19	Schematic Diagram of the Flow of Water in the	4.5 104
1.0 12	Motherlode Regional Bundle (Stanislaus River)	4.3-114
1212	Schematic Diagram of the Flow of Water in the	4.5-114
4.5-15	Motherlode Regional Bundle (Merced River)	4.3-122
1211	Schematic Diagram of the Flow of Water in the	4.5-122
4.5-14		1 2 197
1915	Kings Crane-Helms Regional Bundle (San Joaquin River)	4.3-127
4.3-13	Schematic Diagram of the Flow of Water in the	1 2 120
1 2 10	Kings Crane-Helms Regional Bundle (Kings River)	4.3-139
4.3-10	Schematic Diagram of the Flow of Water in the	4 0 140
	Kings Crane-Helms Regional Bundle (Tule River)	4.3-148

Figure		Page
4.3-17	Schematic Diagram of the Flow of Water in the	
	Kings Crane-Helms Regional Bundle (Kern River)	4.3-152
	Volume 3	
4.4	Fisheries and Aquetic Piology	
4.4 4.4-1	Fisheries and Aquatic Biology Chinook Salmon and Steelhead Spawning and Rearing Habita	at 4.4-3
	. 0	
	Volume 4	
4.5	Terrestrial Biology	ll figures following 4.5-549
4.5-1	Species Occurrences Shasta Regional Bundle	
4.5-2	Species Occurrences Shasta Regional Bundle	
4.5-3	Species Occurrences Shasta Regional Bundle	
4.5-4	Species Occurrences Shasta Regional Bundle	
4.5-5	Species Occurrences Shasta Regional Bundle	
4.5-6	Species Occurrences Shasta Regional Bundle	
4.5-7	Species Occurrences Shasta Regional Bundle	
4.5-8	Species Occurrences Shasta Regional Bundle	
4.5-9	Species Occurrences Shasta Regional Bundle	
4.5-10	1	
	Species Occurrences Shasta Regional Bundle	
	Species Occurrences Shasta Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences DeSabla Regional Bundle	
	Species Occurrences Drum Regional Bundle (Potter Valley)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Drum Regional Bundle (Spaulding)	
	Species Occurrences Motherlode Regional Bundle	
4.5 - 35	Species Occurrences Motherlode Regional Bundle	
4.5 - 36	Species Occurrences Motherlode Regional Bundle	

<u>Figure</u>	e · · · · · · · · · · · · · · · · · · ·	Page				
4.5-38 4.5-39 4.5-40 4.5-41 4.5-42 4.5-43 4.5-44 4.5-45 4.5-46 4.5-47 4.5-48 4.5-49	Species Occurrences Motherlode Regional Bundle Species Occurrences Kings Crane-Helms Regional Bundle					
	VOLUME 5					
4.6-11 4.6-12 4.6-13 4.6-14	Recreation Lake Britton Recreation Area Shasta Regional Bundle Iron Canyon Reservoir Recreation Area Shasta Regional Bundle North Battle Creek Recreation Area Shasta Regional Bundle Lake Almanor Recreation Area DeSabla Regional Bundle Butt Valley Reservoir Recreation Area DeSabla Regional Bundle Bucks Lake Recreation Area DeSabla Regional Bundle Lake Pillsbury Recreation Area Drum Regional Bundle Englebright Lake Recreation Area Drum Regional Bundle Lake Spaulding Recreation Area Drum Regional Bundle Lindsey Lakes Recreation Area Drum Regional Bundle Feeley Lake Recreation Drum Regional Bundle Lake Valley Recreation Area Drum Regional Bundle Blue Lakes Recreation Area Motherlode Regional Bundle Bear River Reservoir Recreation Area Motherlode Regional Bundle Pinecrest Lake Recreation Area Motherlode Regional Bundle	owing 4.6-334				
4.6-16 4.6-17 4.6-18 4.6-19	Kennedy Meadows Recreation Area Motherlode Regional Bundle Bass Lake Recreation Area Kings Crane-Helms Regional Bundle Kerckhoff Lake Recreation Area Kings Crane-Helms Regional Bundle Courtright Reservoir Recreation Area Kings Crane-Helms Regional Bundle Wishon Reservoir Recreation Area Kings Crane-Helms Regional Bundle	e				
4.8 4.8-1 4.8-2	Agriculture Locations of Known Agricultural Leases Shasta Regional Bundle (Local Bundles 1, 2, 3 & 4) Locations of Known Agricultural Leases DeSabla Regional Bundle	4.8-10				
4.8-3	(Local Bundles 5, 6 & 8) Locations of Known Agricultural Leases Drum Regional Bundle (Local Bundle 11)	4.8-16 4.8-24				

Figure					
Locations of Known Agricultural Leases Motherlade Regional Rundle					
	4.8-31				
Locations of Known Agricultural Leases Kings Crane-Helms					
Regional Bundle (Local Bundle 17)	4.8-35				
VOLUME 6					
Hazards and Hazardous Materials					
	4.9-12				
· · · · · · · · · · · · · · · · · · ·	4.11-92				
	4.11-93				
	4.11-94 4.11-95				
	4.11-95 4.11-96				
Telecommunication rectwork Diagram Rings Crane-riems regional Dundie	4.11-50				
Noise					
Typical Range of Common Sounds	4.13-2				
Examples of Outdoor Day-Night (Ldn) Averaged Sound Levels in dB Measured at Various Locations	4.13-3				
A4 0 W					
· · · · · ·	4.14-5				
Northern Central Camornia Air Basins	4.14-3				
Volume 7					
	4 15 5				
	4.15-5				
	4.15-9				
•	4.13-3				
	4.15-15				
(below), DeSabla Regional Bundle	4.15-19				
Potter Valley Landscape, Drum Regional Bundle	4.15-25				
	4.15-29				
	4 4 5 0 5				
	4.15-35				
	4.15-37				
	Locations of Known Agricultural Leases Motherlode Regional Bundle (Local Bundles 13 & 14) Locations of Known Agricultural Leases Kings Crane-Helms Regional Bundle (Local Bundle 17) VOLUME 6 Hazards and Hazardous Materials Typical Hydropower Dam Showing Location of Public Safety Facilities Public Services and Utilities Telecommunication Network Diagram Shasta Regional Bundle Telecommunication Network Diagram DeSabla Regional Bundle Telecommunication Network Diagram Motherlode Regional Bundle Telecommunication Network Diagram Motherlode Regional Bundle Telecommunication Network Diagram Kings Crane-Helms Regional Bundle Telecommunication Network Diagram Kings Crane-Helms Regional Bundle Noise Typical Range of Common Sounds Examples of Outdoor Day-Night (Ldn) Averaged Sound Levels in dB Measured at Various Locations Air Quality Northern Central California Air Basins VOLUME 7 Aesthetics Hat Creek 1 Powerhouse (above), Watershed Lands East of Hat Creek (below), Shasta Regional Bundle Watershed Lands in the Hat Creek/Pit River Area (above), McCloud Reservoir from the Boat Ramp (below), Shasta Regional Bundle Caribou Powerhouse (above), Lake Almanor from southwest shore (below), DeSabla Regional Bundle Humbug Valley (above), Feather River Canyon below Belden Dam				

<u>Figur</u>	<u> </u>	Page	
4.15-9	Landscape in the North Fork Area (above), Manzanita Lake	4 15 20	
	(below), Kings Crane-Helms Regional Bundle	4.15-39	
4.16	Geology, Soils, and Mineral Resources		
	Geomorphic Provinces of California	4.16-9	
	Generalized Geologic Map of California	4.16-11	
	Peak Groundshaking Acceleration Map of California	4.16-15	
	Faults Shasta Regional Bundle	4.16-25	
	Mineral Land Classification Shasta Regional Bundle Local Bundles 1		
	Faults DeSabla Regional Bundle	4.16-41	
	Faults Drum Regional Bundle	4.16-53	
	Faults Drum Regional Bundle Local Bundle 10	4.16-57	
	Faults Motherlode Regional Bundle	4.16-65	
	0 Faults Kings Crane-Helms Regional Bundle		
	Local Bundles 16, 17 & 18	4.16-77	
4.16-1	1 Faults Kings Crane-Helms Regional Bundle		
	Local Bundles 19 & 20	4.16-79	
5.	ADDITONAL CEQA CONSIDERATIONS		
5.4	Cumulative Impacts all figure	res following 5.4-57	
5.4 - 1	Cumulative Projects Shasta Regional Bundle		
5.4-2	Cumulative Projects DeSabla Regional Bundle		
5.4-3	Cumulative Projects Drum Regional Bundle Local		
	Bundles 9, 11 & 12		
5.4-4	Cumulative Projects Motherlode Regional Bundle		
5.4-5	Cumulative Projects Kings Crane-Helms Regional Bundle		
	Local Bundles 16, 17 & 18		
5.4-6	Cumulative Projects Kings Crane-Helms Regional Bundle		
	Local Bundles 19 & 20		
6.	ALTERNATIVES TO THE PROPOSED PROJECT	0.07	
6-1	Annual Hydropower Generation	6-37	
6-2	Average Monthly Hydropower Flows	6-37	
6-3	Monthly Powerhouse Flows vs. Historic Pattern	6-38	
6-4	Monthly Powerhouse Flows vs. No Project/Baseline Case	6-39	
6-5	Total Pacific Gas and Electric Company Pit McCloud System Storag		
6-6	Total Pacific Gas and Electric Company NF Feather River System S	0	
6-7	Total Pacific Gas and Electric Co. Drum Spaulding System Storage	6-42	
6-8	Total Lake Pillsbury Reservoir Storage	6-43	
6-9	Total Pacific Gas and Electric Company Mokelumne River System S	0	
6-10	Total Pacific Gas and Electric Company Stanislaus River System Sto	_	
6-11	Total Pacific Gas and Electric Company Crane-Kerckhoff System St	O	
6-12	Example Hourly Output Comparing PowerMax and Single Owner C	Cases 6-126	
6-13	Comparison of NF Feather River Hydro Output with and without Participation in the Ancillary Services Regulation Market	6-129	
	i arucipation in the Anchiary Services Regulation ivialket	0-129	