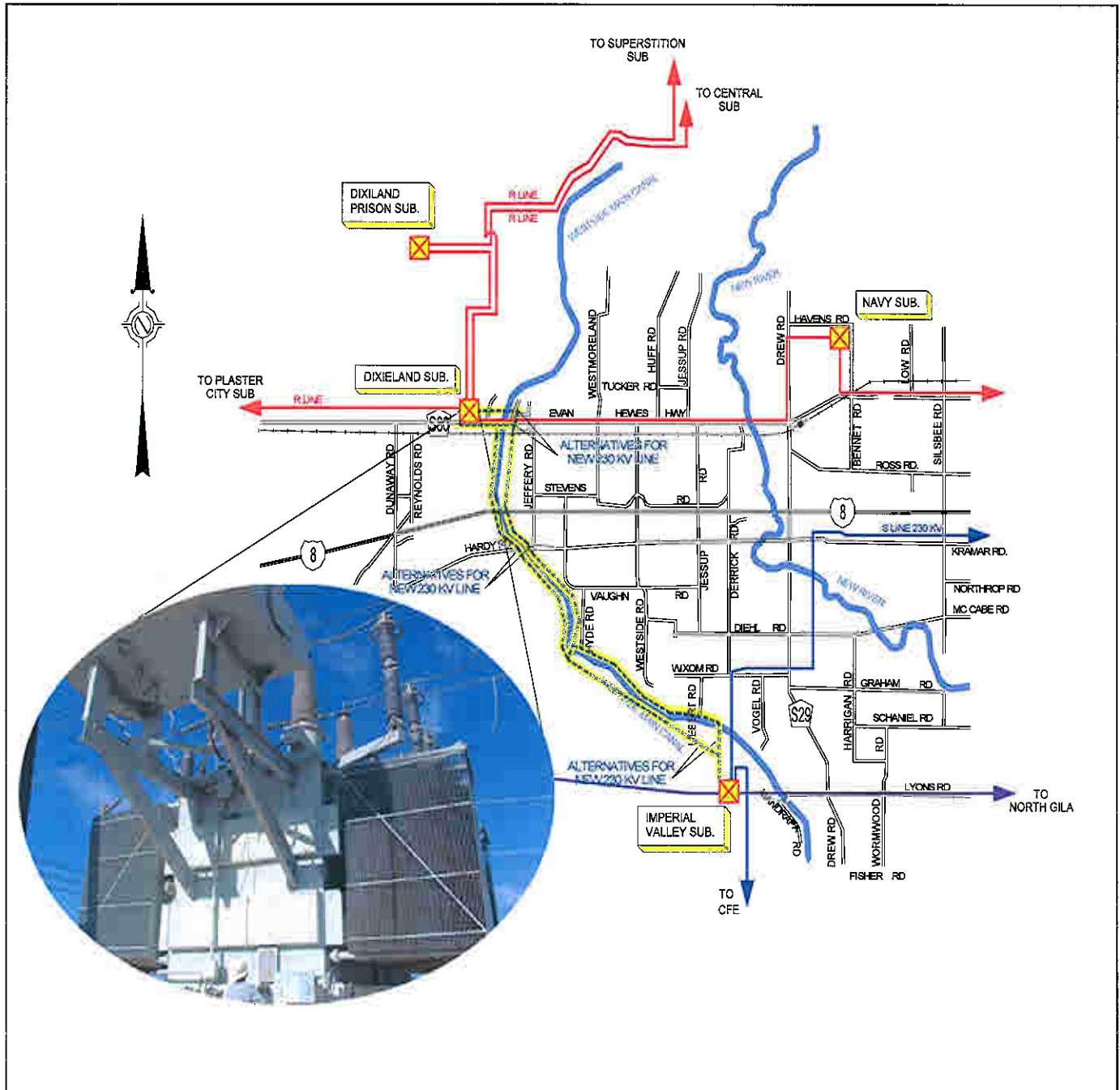




IMPERIAL IRRIGATION DISTRICT ENERGY DEPARTMENT SYSTEM PLANNING



IV Substation-Dixieland 230 KV Interconnection Project Major Work Authorization

P-6574

October 24, 2006

MAJOR WORK AUTHORIZATION
IV Sub-Dixieland 230 kV Interconnection Project

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MAJOR WORK AUTHORIZATION

IV Sub-Dixieland 230 kV Interconnection Project

INTRODUCTION

The information contained in this document outlines the design and construction of a new 230kV line from IV Substation (IV Sub)¹ to Dixieland Substation, and its associated terminal equipment at each Substation. The project also includes the installation of a 300MVA 230/92 kV transformer at Dixieland Substation. In addition, this document contains budgetary cost estimates, a preliminary project schedule, information on the project team members and project authorization sign-off sheet.

EXECUTIVE SUMMARY

The IV-Dixieland Project consists of building a 230kV line from IV Substation to Dixieland Substation. The cost of the 230KV Line is estimated at \$ 14,959,000.00.

Funding for this project has been allocated in the 2006, 2007 and 2008 Capital Budget and reviewed by the Energy Budget Administration. The project team may revise the total funding amount upon design completion and construction unit final review.

The estimated project in service date is October 24, 2008.

PROJECT DESCRIPTION

The IV Sub–Dixieland 230kV Interconnection Project (Project Number P-6574) consists in building a new single circuit 230kV line between Imperial Valley Substation and Dixieland Substation. The approximate length of the new 230 kV line will be 8.5 miles.

The project also includes the following:

Dixieland Substation.

- Modify the existing 92kV bus configuration, from “Single bus, single breaker” to “Breaker and One Half” scheme; the substation will have 4 bays to accommodate up to 8 circuits².
- Build a 230kV ring bus to accommodate a new 230/92kV 300MVA transformer bank and the new line to Imperial Valley Substation, the bus will be prepared to accommodate a second 230kV line.
- Install a 12.5MVA 92/13.2kV transformer³.
- Install a new control house and relays/control schemes for all equipment installed at the substation.

¹ IV Sub is co-owned by San Diego Gas & Electric and Imperial Irrigation District

² Three circuits will be spares

³ The 12.47kV distribution bus will be maintained



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

- Remove the 92/34.5kV transformer, 34.5kV bus and 34.5/12.47kV transformer.

The pre-project and post-project configurations of Dixieland substation are depicted in the one-line diagrams, which have been included in appendixes A and B.

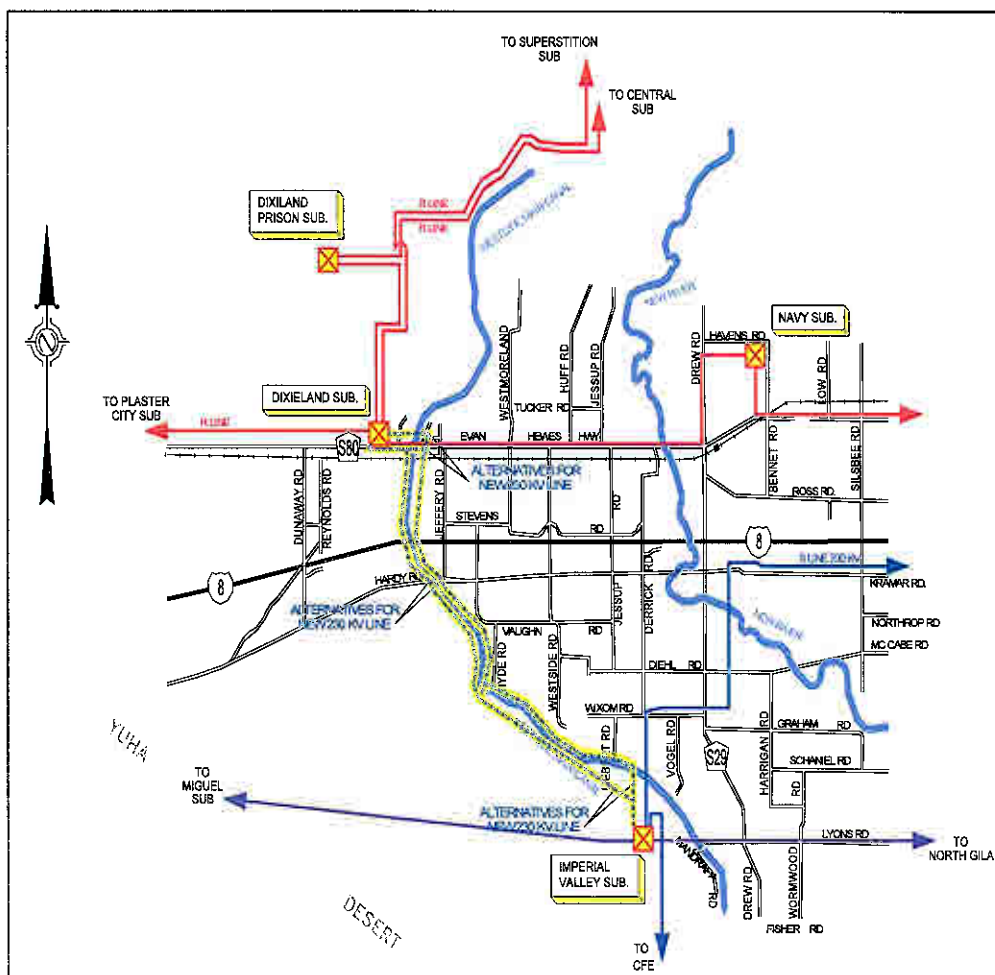
Imperial Valley Substation⁴

- Install a 230kV breaker and associated equipment to create a new line bay position to accommodate the new line to Dixieland

The post-project configuration of Imperial Valley substation is depicted in the one line diagram, which has been included in appendix C.

The following figure depicts the proposed geographical location of the 230kV line.

Figure 1 – 230kV line



⁴ San Diego Gas and Electric will perform all the work at Imperial Valley Substation and will be funded by IID



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

PROJECT JUSTIFICATION

This transmission project will backup the potential outage of the existing "S" 230 kV Line⁵. The "S" Line represents the only permanent interconnection between IID and SDG&E. The second interconnection line will increase the IID import/export capability to meet the future load requirements. In addition, IID will increase the system reliability and improve the voltage profile at the Imperial Valley transmission network. The new breaker-and-one-half configuration at Dixieland Substation will provide higher system reliability, better operating flexibility and reinforce the transmission network.

The new 230 kV interconnection project will allow the IID to continue importing and exporting up to its interconnection capability when one of the two 230 kV Lines is taken out of service (due to line maintenance or equipment failure) for a long period-of-time with minimum impact to the IID System reliability.

IID notified SDG&E the need for utilizing the vacant 230 kV bay next to S Line breakers at IV Substation on time, and SDG&E confirmed the bay availability for our second interconnection line.

PROJECT SCOPE:

1. Obtain the necessary right-of-way required to construct the new 230kV transmission line from IV Sub to Dixieland Substation. Temporary construction right-of-way may be required.
2. Obtain the necessary permits and comply with the environmental requirements.
3. Perform the engineering design as described in the project description of this document. Refer to Appendixes A, B and C.
4. Order the necessary equipment and materials for this project. (*Staged materials and equipment ordered for other non-priority projects may be used in this project*).
5. Perform the construction of the project.
6. Complete the project by the in service date of October 24, 2008.

⁵ The existing 230kV "S" line is constructed with single wood pole.



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

REAL ESTATE REQUIREMENTS:

This authorization action is conditioned upon completion of all requirements specified in CEQA. This includes, but is not limited to an environmental assessment, an environmental impact review, or negative impact declaration. No property acquisition, right-of-way acquisition, or award of contracts for construction will be finalized until all requirements are complete.

ENVIRONMENTAL COMPLIANCE:

This authorization action is conditioned on completion, prior to commencement of work, of all requirements specified in the California Environmental Quality Act (CEQA), the Endangered Species Act (ESA) or other applicable environmental or wildlife resource laws. IID's Environmental Compliance Section (ECS) will review any of the proponent's environmental documentation to determine compliance with existing environmental regulations.



**MAJOR WORK AUTHORIZATION
IV Sub-Dixieland 230 kV Interconnection Project**

PROJECT FINANCING/ACCOUNTING

Project's Funding Source: pending

Funding for this project has been allocated in the 2006, 2007 and 2008 Capital Budget and reviewed by the Energy Budget Administration.

The project cost has been estimated at \$14,959,000.00. Included in the total cost is \$1,360,000.00 for contingencies⁶.

The project team will revise the total funding amount upon design completion and construction unit final review.

Estimated Summary of Probable Costs is as:

IID Engineering Services (Design)

Substation	\$	110,000.00	+
Relays	\$	16,000.00	
Transmission	\$	110,000.00	
Distribution	\$	-	
Communication & SCADA	\$	5,000.00	
	\$	<u>241,000.00</u>	

Equipment and Material

Substation	\$	4,013,000.00	+
Relays	\$	160,000.00	
Transmission	\$	3,763,000.00	
Distribution	\$	-	
Communication & SCADA	\$	20,000.00	
	\$	<u>7,956,000.00</u>	

Substation Exterior Work

Wall Fence (South Side)	\$	-	+
Grading	\$	-	
Road Base	\$	-	
Concrete (Foundations)	\$	-	
Landscaping	\$	-	
	\$	<u>-</u>	

⁶ Project contingency is 10%, rounded to thousands



MAJOR WORK AUTHORIZATION
IV Sub-Dixieland 230 kV Interconnection Project

Construction Labor

Substation	\$	982,000.00	+
Relays	\$	28,000.00	
Transmission	\$	4,260,000.00	
Distribution	\$	-	
Communication & SCADA	\$	8,000.00	
	\$	<u>5,278,000.00</u>	

Operational Resources

Real Estate	\$	50,000.00	+
Environmental	\$	50,000.00	
	\$	<u>100,000.00</u>	

Administrative Cost

Transmission Plannig	\$	4,000.00	+
Distribution Planning	\$	-	
Project Management	\$	20,000.00	
	\$	<u>24,000.00</u>	

Project Cost Estimate

Subtotal	\$	13,599,000.00	+
Contingency 10 %	\$	<u>1,360,000.00</u>	
Grand Total	\$	14,959,000.00	



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

COST-BENEFIT ANALYSIS AND RISK ASSESSMENT

OVERVIEW

The project to construct approximately 8.5 miles of a single 230kV transmission line from IV Substation to Dixieland Substation in conjunction with the installation of one (1) 230/92 kV 300 MVA Bank at Dixieland Substation will upgrade the transmission transfer capability between Imperial Irrigation District (IID) and San Diego Gas & Electric (SDG&E).

The project entails the engineering, equipment/materials procurement and construction costs to provide a second transmission path between SDG&E and IID to maintain the transmission transfer capability between SDG&E and IID in the event of one element out of service (n-1 condition). The in-service date for this project is anticipated to be October 24, 2008.

ASSUMPTIONS

Assumptions used for the cost-benefit analysis were based on information of previous and forecasted summer peaks scenarios as well as data received from the power system operation section. Part of the intent of the cost-benefit analysis and risk assessment is to assess the reasonableness of the data and the methodology used in constructing the Economic Benefit Analysis model.

- Failure of the existing "S" line would result in the need to replace cheaper, purchased energy with higher cost, internal energy from our gas turbines for a period of seven days, all day. The gas turbines hourly cost was calculated by Planning Section staff by summing the fuel, auxiliary energy and variable O&M costs for each unit. The incremental cost between external and internal energy costs was used. The incremental cost was further reduced to 30% of the total to offer a more conservative figure.
- The cost of cold starting the gas turbines for seven days was also reduced to a more conservative 30% figure.
- The line is estimated to have a useful life of 34 years.
- An interest rate of 5% was used to calculate the project's funding cost. No adjustments were made to predict the variability of this rate over the useful life of this project.
- A discount or hurdle rate of 5.5% was used in this analysis according to current CFO guidelines.



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

PROJECT COSTS AND BENEFITS

The estimated cost for this project is \$14,959,000. Funding for this project will be allocated in the 2006, 2007 and 2008 capital budget, and reviewed by the Energy budget Administration. A 10% reserve is included in the estimate to handle contingencies and other unanticipated costs.

The primary benefit of this project is the avoided incremental cost of internal generation versus external energy and the gas turbine startup costs required to replace the energy that would carry through the path representing the combination of the transmission line and the transformer bank. The increase in transmission transfer capability between both companies is anticipated to be approximately of 200 MW. Other than project costs and the cost to fund the project, no other costs were identified.

PROJECT FINANCIAL METRICS

A cost-benefit analysis was completed on this project using a spreadsheet modeled for the evaluation of reliability projects.

Based on the assumptions previously defined, the following table highlights the financial metrics resulting from the cost-benefit analysis:

FINANCIAL METRIC	RESULT
Net Present Value (NPV)	\$ 6,960,225
Internal Rate of Return (IRR)	9 %
Estimated Payback Period	12 years
Return on Investment (ROI) Simple	121 %
Discounted	31 %

The full cost-benefit spreadsheet has not been included in the MWA but is available if the reader desires additional information related to these results.



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

RISK ASSESSMENT

The interconnected transmission systems are the principal media for achieving reliable electric supply. They tie together the major electric system facilities, generation resources, and customer demand centers. These systems must be planned, designed, and constructed to operate reliably within thermal, voltage, and stability limits while achieving their major purposes.

The existing 230 kV "S" line was originally placed in operation in 1984, it has been used as a regular path for importing energy from "CAISO" and Texas, New Mexico, Nevada and Eastern areas through the South West Power Link (SWPL).

The line is single wood pole configuration; several years ago, the line fell down causing the system to be operated under extreme stress condition. Under the current operating conditions, the weakness of the line might expose it to a potential failure on its structure. This latent scenario will cause the start up of gas turbines to supply the deficit of energy that normally is flowing through this line.

The installation of the new 230 kV line in combination with the transformer bank at Dixieland will give flexibility to the system for scheduling outages and maintenance jobs. In addition, the system will be able to withstand contingencies and keep voltage profiles at permissible levels after a disturbance occurs.

Being IID the sixth largest utility in California, it operates over 1,000 megawatts of energy derived from a diverse resource portfolio that includes its own generation, and long and short-term power purchases.

As previously stated, this project is anticipated to increase the IID's import/export capacity between SDG&E's and IID's IV sub and IID as well as increasing system reliability.

The risk in not doing this project is the inability to serve anticipated load growth in a good reliable form or to serve existing load in case of failure of the existing 230kV "S" line. Continued development, normal load growth and system reliability are the primary drivers for this project. The continued reliability of service in the area depends in portion on maintaining the interconnection of the SDG&E/IID intertie in the event of one single element of out service ("S" line).



**MAJOR WORK AUTHORIZATION
IV Sub-Dixieland 230 kV Interconnection Project**

PROJECT TEAM

Chief Financial Officer.....	Robert J. Vodzack
Department Manager.....	John Federowicz
Assist. Manager Project Owner.....	J. C. Sandoval
System Planning Project Owner.....	David L. Barajas

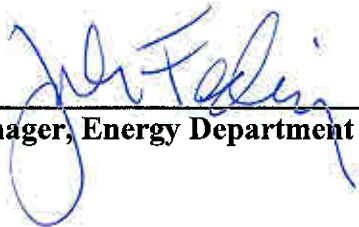
Project Leads:

Project Planning Engineer.....	Jorge L. Barrientos
Project Manager.....	Eddie Lutz
Project Engineer (T & S).....	Oscar Kebriti
Project Engineer (Telecom).....	Javier Jimenez
Project Management Coordinator.....	Walter Gonzalez
Project Substation Construction/Inspection.....	Al Minor
Project Budget Coordinator.....	Corina Jaramillo
Project Siting	Eddie Villanueva
Environmental Compliance	Michael Remington
Real Estate	Jim Kelley




MAJOR WORK AUTHORIZATION
IV Sub-Dixieland 230 kV Interconnection Project


PROJECT AUTHORIZATION
SIGN-OFF SHEET




Manager, Energy Department 10/17/06
Date



Chief Financial Officer 10/15/06
Date



General Manager 10-24-06
Date



President, Board of Directors 10-24-06
Date

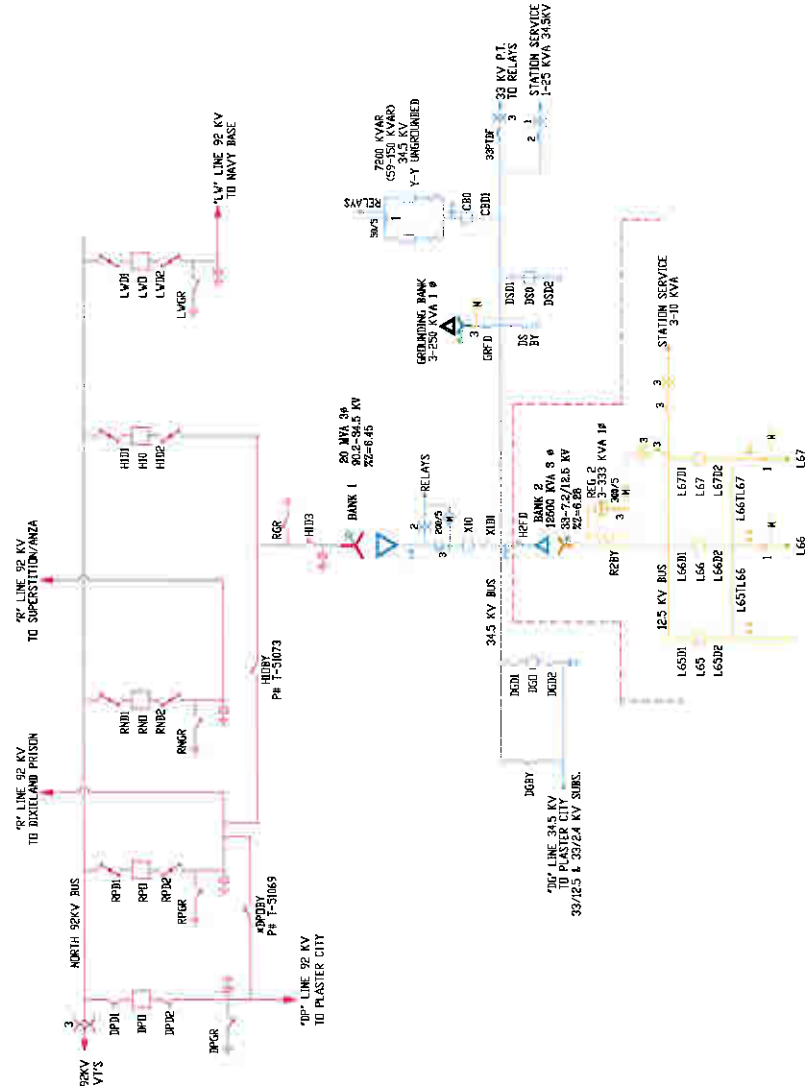


MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

Appendix A –Dixieland Substation One-line Diagram Existing Conditions

IV SUB - DIXIELAND INTERCONNECTION PROJECT

DIXIELAND EXISTING CONDITIONS

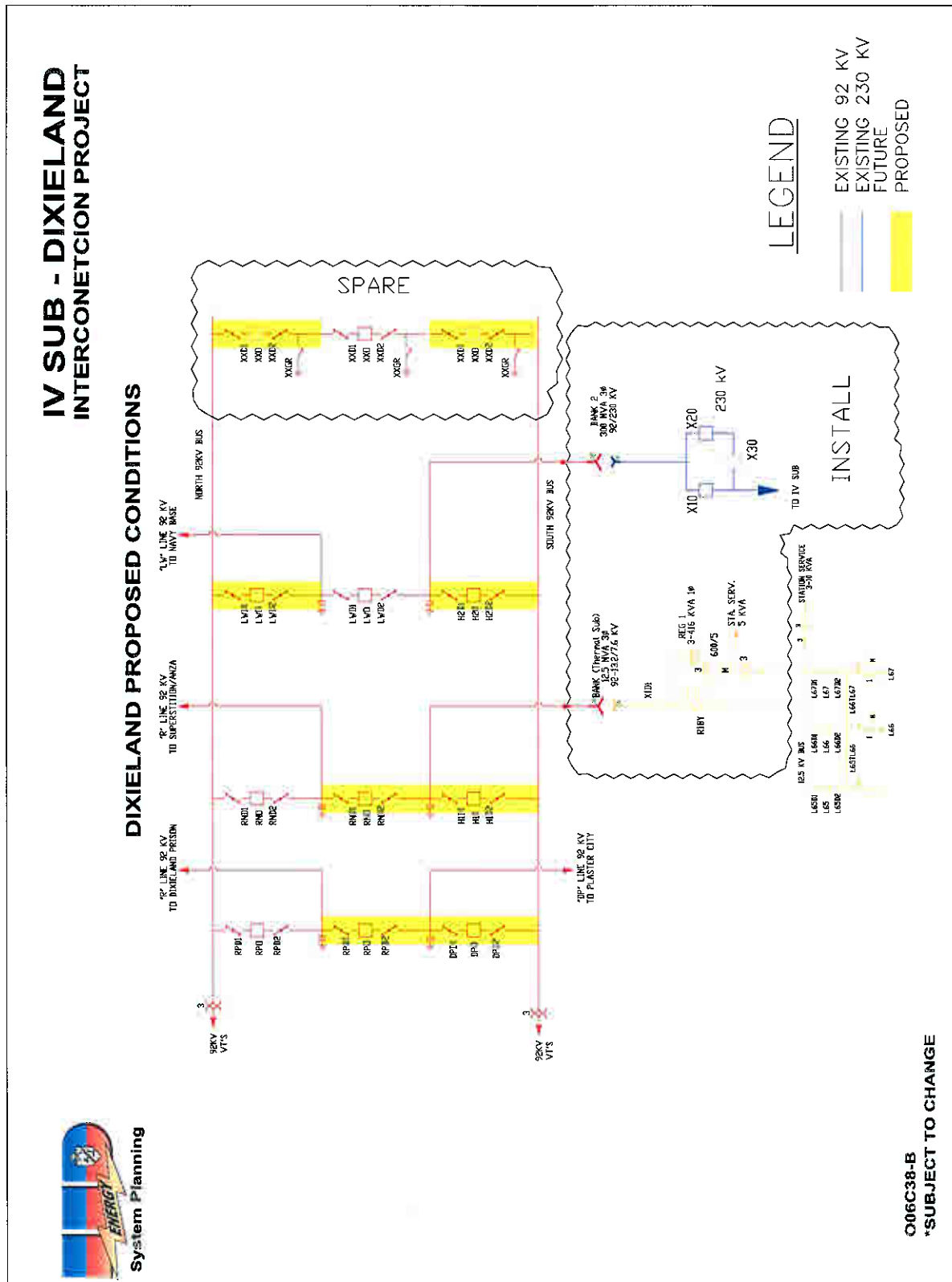


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*SUBJECT TO CHANGE



MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

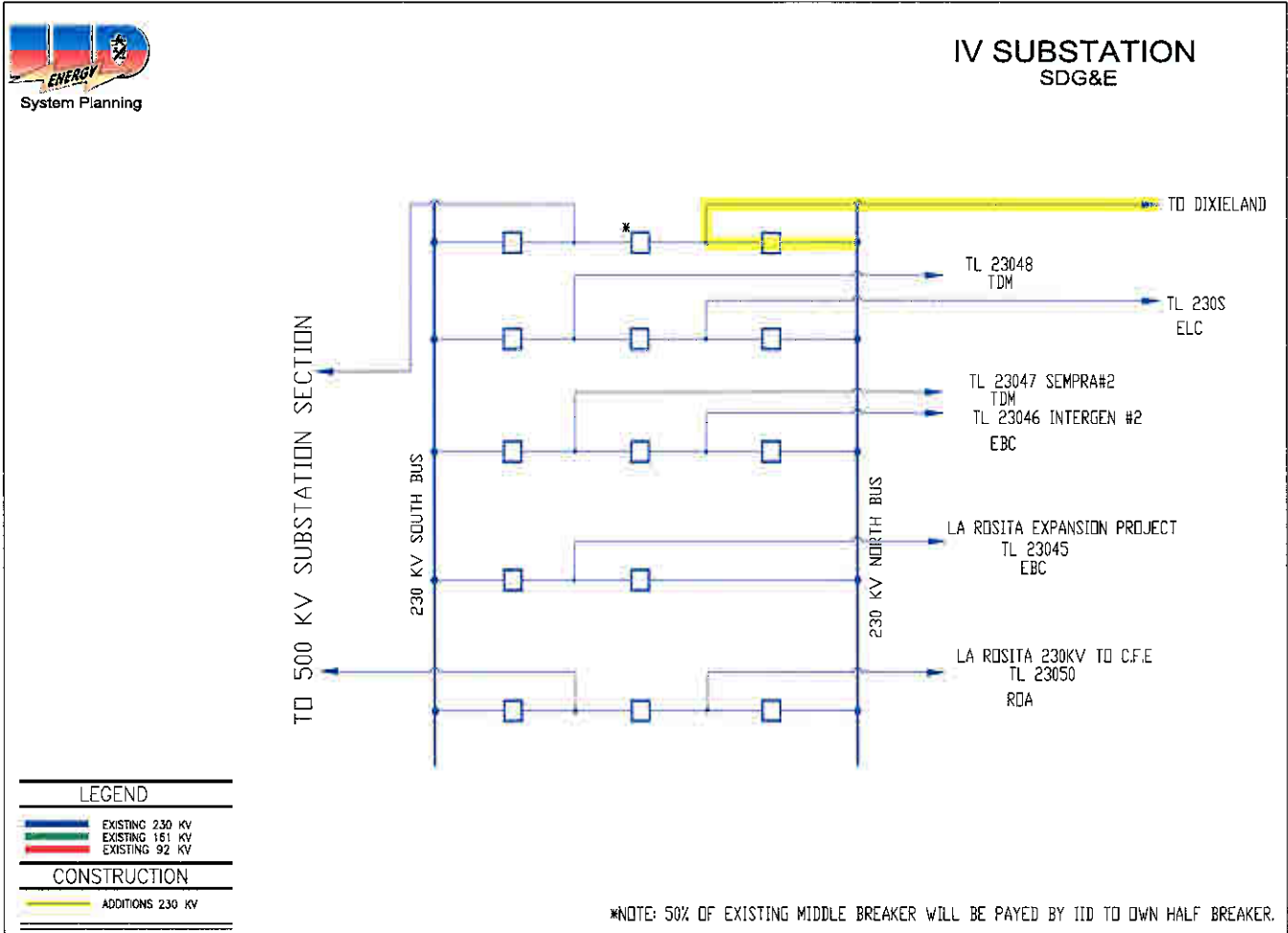
Appendix B - Dixieland Substation Conceptual Diagram Proposed Conditions





MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

Appendix C- IV Substation Proposed Conditions.





MAJOR WORK AUTHORIZATION IV Sub-Dixieland 230 kV Interconnection Project

Appendix D – Project Schedule

IC	TaskName	Start	Finish	2005	2006	2007	2008	2009	2010	2011
1										
2										
3										
4	IV-DIXIELAND 230KV PROJECT	Mon 8/7/06	Fri 10/24/06							
5	Planning & Siting Process	Mon 8/7/06	Tue 12/12/06							
6	Environmental Process	Mon 9/11/06	Fri 9/28/07							
7	Board/MWA Approval	Tue 9/12/06	Tue 9/12/06							
8	Right of Way	Mon 9/18/06	Fri 10/26/07							
9	Engineering	Mon 10/9/06	Wed 10/31/07							
10	Start Engineering	Mon 10/9/06	Mon 10/9/06							
11	Engineering Complete	Wed 10/31/07	Wed 10/31/07							
12	Material	Fri 10/27/06	Thu 8/28/08							
13	Material Procurement Start	Fri 10/27/06	Fri 10/27/06							
14	Material Procurement Complete	Thu 8/28/06	Thu 8/28/06							
15	Construction	Mon 3/3/08	Fri 9/12/08							
16	Start Construction	Mon 3/3/08	Mon 3/3/08							
17	Construction Complete	Fri 9/12/08	Fri 9/12/08							
18	Commission	Mon 9/8/08	Fri 9/19/08							
19	Start Implementation Phase	Mon 9/8/08	Mon 9/8/08							
20	Commissioning Complete	Fri 9/19/08	Fri 9/19/08							
21	Project Closure	Mon 9/22/08	Fri 10/24/08							

IMPERIAL IRRIGATION DISTRICT
Electric System

Summary of Proposed Five Year Capital Plan (\$000)
Electric Transmission

Line No.	Project	Fiscal Year Ending December 31					Total		
		2006 (b)	2007 (c)	2008 (d)	2009 (e)	2010 (f)		2011 (e)	2012 (f)
Estimated Capital Expenditures									
New Substations									
1	New Shea Homes	\$ 1,381	\$ 80	\$ 5,939	\$ 4,924	\$	\$	\$	7,400
2	St. Augustine	200		1,095					6,219
3	New Gateway	700							700
4	Suncal (Shadow Hills Bank 2)	400	80	2,450					2,900
5	Lavigne	2,000	6,645						8,645
6	New WTCU	200		80	5,479				5,759
7	Indian Hills (230/92-kV Switching Station)	300	200	165	8,205				8,870
8	La Paloma	200							200
9	Victoria Ranch	2,000	80	5,479					7,559
10	Shields	1,100							1,100
11	Los Lagos (New Pruet)	200	1,095	4,504					5,799
12	Kohl Ranch	200	8,911						9,111
13	Kohl Ranch #2				80	5,939			6,019
14	Citrus		6,319						6,319
15	New Heber		80	5,479					5,559
16	Taylor		80	5,479					5,559
17	Sub. Site Acquisitions		300					300	1,200
18	Polo Square								5,559
19	Paradise Valley		80						15,747
20	Buchanan		100						5,559
21	Lucky Ranch		80						4,259
22	Daily		70						4,439
23	Sub Total New Substations	8,881	23,841	31,370	54,151	6,239			124,482
Existing Substations/Transmission Lines Upgrades									
24	Satron Sea Unit 6	1,000							1,000
25	Clark	1,000							1,000
26	Euclid	50							5,609
27	Jackson	2,000	9,545		1,095			4,864	11,545
28	Avenue 58-CV & ECSS-Niland	300							300
29	Thermal (Relocate - New)	100							6,119
30	Jefferson (CS Line cutover)	520	1,389		80	5,939			1,909
31	Dixieland (300kV xfmr & 8.5 miles of 230-kV)	100	600	400	13,859				14,959
32	Van Buren	970							970
33	Coachella Valley	300							300
34	Yucca (AX line to 230-kV & 98 MVA xfmr)	100		100	6,140				6,340
35	Avenue 42	2,000							2,000
36	Mirage-Rannon	50							50
	Highline	500	3,874						4,374
	Highline 230-kV addition		50	6,610					6,660

IMPERIAL IRRIGATION DISTRICT
Electric System

Summary of Proposed Five Year Capital Plan (\$000)
Electric Transmission

Line No.	Project (a)	Fiscal Year Ending December 31					Total (g)
		2006 (b)	2007 (c)	2008 (d)	2009 (e)	2010 (f)	
37	Heber-Imperial	500	60	1,607			2,167
38	Mecca-Oasis (to "R" line double circuit)	200	500	3,400			4,100
	Mecca 230-kV line		100	1,000	6,640		7,740
	Avenue 58 (xfrm addition)			100	3,500		3,600
	Coachella Valley Sub Addition				1,095	4,364	5,459
39	Sub Total Existing Substations/Transmission	9,690	16,118	13,217	32,409	14,767	86,201
	Substation Capacitor Banks/Breaker Upgrade						
40	Pilot Knob Breaker	100	308				408
41	Capacitor Banks 92-kV Network, Ave 42	804					804
42	Capacitor Banks 92-kV Network, Ave 58	804					804
43	El Centro Switching Station Breaker	389					389
44	Ave 48 Feeder Breaker replacement		500				500
45	Ave. 52 Bank 2 Addition		50	2,450			2,500
46	Carreon Bank 2 Addition		50	2,450			2,500
47	Subst. Feeder Getaways			10,575		7,400	32,525
48	East Mesa I - H10 circuit breaker		180				180
49	ECSS 230/92-kv Transformer Addition		3,400	3,186			6,586
50	Francis Way Bank 2 Addition		50	2,450			2,500
51	Mecca Bank 2 Addition		2,320				2,320
52	Monroe Bank 2 Addition		50	2,450			2,500
53	Van Buren Feeder Breaker Replacement		500				500
54	Coachella Switching Station New 92-kV bay			300			300
55	Sky Valley Bank 2 Addition			180		2,320	2,500
56	Terminal, Cap Bank, El Centro		867				867
57	El Centro Switching Station-New 230 kv Bus		300				300
58	El Centro Switching Station-161 kv Modifice		200				200
59	Sub Total Substation Capacitor Banks/Break	3,463	5,408	24,041	16,870	7,400	57,182
	Transmission Line Extensions/Upgrades						
60	Transmission Line Expansion (Greenpath)		2,300	1,000			3,300
61	IID IV Sub Phase Shifter			1,820			1,820
62	San Felipe Sw/Station (IID's portion)				1,700	6,800	8,500
63	IV-San Felipe 500-kV (IID's portion)				2,140	8,500	10,700
64	A and B Line Conversion to 230-kV		100	9,800			10,000
65	KN/KS Line (Midway to CV)	500	1,000	7,000			8,500
66	KN/KS Cathodic Protection (Highline-Midw)		600				600
67	Coachella Valley KS Line Swap		253				275
68	"L" Line 230-kV Cutover (ECSS-Mecca 230)	50			858	43,842	44,750
69	"CE" Line	50					50
70	Sub Total Transmission Line Extensions/Upg	600	4,253	19,643	15,698	59,202	99,395

Barajas, David L

From: Barajas, David L
Sent: Friday, October 13, 2006 11:45 AM
To: Ainsworth, Sondra; Jaramillo, Corina
Cc: Najera, Raquel; Sandoval, Juan C
Subject: RE: 4 pending MWA requests

Sondra and Corina, below is the information required re to the pending MWA's.
Please call me if you have any questions.

Thanks,

	2006	2007	2008	
Kohl Ranch				
Engineering	\$ 58,000	\$ 353,000	\$ -	\$ 411,000
Lon Lead Item Equipment	\$ -	\$ 1,160,000	\$ -	\$ 1,160,000
Real Estate & Environmental	\$ -	\$ 67,000	\$ -	\$ 67,000
Total	\$ 58,000	\$ 1,580,000	\$ -	\$ 1,638,000
ECSS Bank 4				
Engineering	\$ 30,000	\$ 47,000	\$ -	\$ 77,000
Lon Lead Item Equipment	\$ 48,000	\$ 1,760,000	\$ 1,692,000	\$ 3,500,000
Real Estate & Environmental	\$ -	\$ 7,000	\$ -	\$ 7,000
Total	\$ 78,000	\$ 1,814,000	\$ 1,692,000	\$ 3,584,000
IV-Dixieland Interconnection				
Engineering	\$ 10,000	\$ 231,000	\$ -	\$ 241,000
Lon Lead Item Equipment	\$ 48,000	\$ 1,760,000	\$ 1,692,000	\$ 3,500,000
Real Estate & Environmental	\$ -	\$ 100,000	\$ -	\$ 100,000
Total	\$ 58,000	\$ 2,091,000	\$ 1,692,000	\$ 3,841,000
Gran Total	\$ 194,000	\$ 5,485,000	\$ 3,384,000	\$ 9,063,000

David L. Barajas

General Superintendent,
System Planning and Engineering
Imperial Irrigation District
(760) 482- 3450 - Office
(760) 427- 3292 - Cellular

From: Ainsworth, Sondra
Sent: Wednesday, October 11, 2006 12:05 PM
To: Jaramillo, Corina; Barajas, David L
Cc: Najera, Raquel
Subject: RE: 4 pending MWA requests

David,

When do you expect to have the figures to Corina? We need to get the Board memo request to Gloria Rivera by Tuesday.

Thanks,
Sondra

8/29/2007