

## Appendix IX-1-C

### SDG&E Transmission

#### Cost Estimates for Pipe Replacements and Pressure Tests

**CHAPTER IX PIPELINE WORKPAPER  
APPENDIX IX-1-C**

**SDG&E Transmission**

<b>Line</b>	<b>Workpaper Page</b>		<b>Line</b>	<b>Workpaper Page</b>
1600	WP-IX-1-C1		3010	WP-IX-1-C7

**San Diego Gas & Electric  
Pipeline Safety Enhancement Program - Workpaper Supporting Chapter IX**

<b>Company</b>	SDG&E	<b>Replacement Mileage</b>		
<b>Plant Category</b>	Trans	<b>Category 4</b>		
		<b>Criteria</b>	<b>Accelerated</b>	<b>Total</b>
<b>Line Number</b>	1600	-	53.6	53.6
<b>Diameter (in.)</b>	16			

**Cost Detail**

<b>Capital</b>		<b>O&amp;M</b>	
Direct Labor	\$ 5,988,400	Direct Labor	\$ -
Direct Non Labor	\$ 318,832,700	Direct Non Labor	\$ -
<b>Total Direct Capital</b>	<b>\$ 324,821,100</b>	<b>Total Direct O&amp;M</b>	<b>\$ -</b>



ACTIVITY AND LOCATION:		SPECIFICATION NO.	A/E FIRM NAME	SHEET					
PROJECT TITLE AND CLIENT:		ESTIMATED BY:	SPEC SERVICES	Sheet 1 of 1					
SOUTHERN CALIFORNIA GAS COMPANY PIPE CONSTRUCTION COST ESTIMATE		SPEC		DATE:	July 28, 2011				
		STATUS OF DESIGN		SPEC Project Number	5057				
		Completed							
DESCRIPTION		QUANTITY		MATERIAL COST		LABOR COST		TOTAL COST	Comments
		NUMBER	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL	TOTAL	
<b>INPUT IN ALL GREEN CELLS</b>									
<b>1 MATERIALS</b>									
<b>36 inch</b>									
Pipe	36	inch, 562 WT X-70	282764	Feet	\$ 242	\$ 68,544,821		\$ 68,544,821	
		Bends, 3R-Forged (minimum of 4, plus 1 bend/250 feet)	1135	Each	\$ 13,275	\$ 15,066,750		\$ 15,066,750	
Pressure Rating	300	lb Block Valve w/Electric Actuator (one per 4 miles)	13	Each	\$ 303,695	\$ 3,948,035		\$ 3,948,035	
		FBE Coating (5/ft)		\$	\$ 10.25	\$ 2,898,331		\$ 2,898,331	
		Miscellaneous Materials (5%)	1	Lot				\$ 4,377,980	
		Freight / Tax	12.5	%				\$ 11,854,490	
Pipe	n/a	Bends, 3R-Forged (minimum of 4, plus 1 bend/250 feet)	0	Feet	\$ -	\$ -		\$ -	
		Bends, 3R-Forged (minimum of 4, plus 1 bend/250 feet)	4	Each	\$ -	\$ -		\$ -	
Pressure Rating	n/a	lb Block Valve w/Electric Actuator (one per 4 miles)	0	Each	\$ -	\$ -		\$ -	
		FBE Coating (5/ft)		\$	\$ -	\$ -		\$ -	
		Miscellaneous Materials (5%)	1	Lot				\$ -	
		Freight / Tax	12.5	%				\$ -	
Pipe	n/a	Bends, 3R-Forged (minimum of 4, plus 1 bend/250 feet)	0	Feet	\$ -	\$ -		\$ -	
		Bends, 3R-Forged (minimum of 4, plus 1 bend/250 feet)	4	Each	\$ -	\$ -		\$ -	
Pressure Rating	n/a	lb Block Valve w/Electric Actuator (one per 4 miles)	0	Each	\$ -	\$ -		\$ -	
		FBE Coating (5/ft)		\$	\$ -	\$ -		\$ -	
		Miscellaneous Materials (5%)	1	Lot				\$ -	
		Freight / Tax	12.5	%				\$ -	
Casing	n/a		0	Feet	\$ -	\$ -		\$ -	
		Miscellaneous Materials (5%)	1	Lot				\$ -	
		Freight / Tax	12.5	%				\$ -	
<b>Total length</b>			<b>53.6</b>	<b>Miles</b>					
<b>Total Material Cost</b>								<b>\$ 106,690,500</b>	
<b>2 CONSTRUCTION</b> (See Appendix for construction type definitions)									
<b>36 inch pipe</b>									
Pipe Install - Type 1			62895	Feet		\$ 275	\$ 17,296,125	\$ 17,296,125	
Pipe Install - Type 2			133165	Feet		\$ 440	\$ 58,592,600	\$ 58,592,600	
Pipe Install - Type 3			84262	Feet		\$ 620	\$ 52,242,440	\$ 52,242,440	
Pipe Install - Type 4			1782	Feet		\$ 1,000	\$ 1,782,000	\$ 1,782,000	
Pipe Install - Type 5			630	Feet		\$ 1,200	\$ 756,000	\$ 756,000	Crossing HWY 15 at two locations
Pipe Install - Type 6			50	Feet		\$ 1,500	\$ 75,000	\$ 75,000	Crossing River
Pipe Install - Type 7			0	Feet		\$ 806	\$ -	\$ -	Facility Piping
n/a			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 1			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 2			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 3			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 4			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 5			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 6			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 7			0	Feet		\$ -	\$ -	\$ -	
n/a			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 1			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 2			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 3			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 4			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 5			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 6			0	Feet		\$ -	\$ -	\$ -	
Pipe Install - Type 7			0	Feet		\$ -	\$ -	\$ -	
Tie-ins Crew Rates			1	Each		\$ 60,000	\$ 60,000	\$ 60,000	
Purging Volume of Nitrogen (to obtain 3 atm (44 psig) on line)			7994964	SCF	\$ 0.19	\$ 1,519,043		\$ 1,519,043	
Purging Labor			2	LS		\$ 25,000	\$ 50,000	\$ 50,000	
95% Abandonment of Existing Pipeline (\$50/CY)			0	CY		\$ 95	\$ -	\$ -	
5% Removal of Existing Pipeline (75% of Construction Labor Cost)			0	%				\$ -	
Mobilization / Demobilization			1	Each		\$ 30,000	\$ 30,000	\$ 30,000	
Contaminated Soil			0	CY		\$ -	\$ -	\$ -	
Asbestos Abatement			0	Feet		\$ -	\$ -	\$ -	
Radiographic Inspection			615	Days	\$ 150	\$ 92,250	\$ 600	\$ 369,000	\$ 461,250
<b>Construction period</b>			<b>623</b>	<b>days</b>					
<b>Total Construction Cost</b>								<b>\$ 132,844,500</b>	
<b>3 SCG LABOR / INSPECTION</b>									
Projects < \$1 million - company labor is 10%			10	%			\$ -	\$ -	
\$1 million < Projects < \$10 million - company labor is 5%			5	%			\$ -	\$ -	
Projects > \$10 million - company labor is 2.5%			2.5	%			\$ 5,988,375	\$ 5,988,375	
<b>Total SCG Labor / Inspection Cost</b>								<b>\$ 5,988,400</b>	
<b>4 DESIGN / ENG. / CONST / ENVIRON.</b>									
Planning / Design / Eng / Coord / Procurement			10	%			\$ 23,953,500	\$ 23,953,500	
Construction Stake, As-Built Survey (2 man crew)			615	Days	\$ 100	\$ 61,500	\$ 1,400	\$ 861,000	\$ 922,500
ROW Acquisition			0	LS			\$ -	\$ -	
Construction Permits			0	LS			\$ -	\$ -	
Environmental Permits			0	LS			\$ -	\$ -	
Environmental Monitoring			0	LS			\$ -	\$ -	
As-Built Drawings (\$2000+\$1/ft)			1	LS			\$ 284,764	\$ 284,764	
<b>Total Design / Engineering / Construction Cost</b>								<b>\$ 25,160,800</b>	
<b>5 CONTINGENCY</b>									
Projects < \$2 million - Contingency is 30%			30	%			\$ -	\$ -	
Projects > \$2 million - Contingency is 20%			20	%			\$ 54,136,840	\$ 54,136,840	
<b>TOTAL PROJECT COST</b> (See Appendix for assumptions/clarifications)								<b>\$ 324,821,100</b>	

**San Diego Gas & Electric  
Pipeline Safety Enhancement Program - Workpaper Supporting Chapter IX**

<b>Company</b>	SDG&E	<b>Hydrotest Mileage</b>		
<b>Plant Category</b>	Trans	<b>Category 4</b>		
		<b>Criteria</b>	<b>Accelerated</b>	<b>Total</b>
<b>Line Number</b>	1600	29.732	14.968	44.700
<b>Diameter (in.)</b>	16			

**Cost Detail**

**O&M**

*Hydrotest*

<b>Direct Labor</b>	\$ 357,300
<b>Direct Non Labor</b>	\$ 9,073,500
<b>Total Hydrotest</b>	\$ 9,430,800

*Hydrotest Repairs*

<b>Direct Labor</b>	\$ 65,000
<b>Direct Non Labor</b>	\$ 585,000
<b>Total Repairs</b>	\$ 650,000

*In Line Inspection*

<b>Direct Labor</b>	\$ 30,000
<b>Direct Non Labor</b>	\$ 270,000
<b>Total ILI</b>	\$ 300,000

*In Line Inspection Repairs*

<b>Direct Labor</b>	\$ 402,000
<b>Direct Non Labor</b>	\$ 3,618,000
<b>Total Repairs</b>	\$ 4,020,000



**San Diego Gas & Electric  
Pipeline Safety Enhancement Program - Workshop Supporting Chapter IX**

**Existing Segments**

Category	Station		Criteria Miles	Diameter	Action	Decision Tree Box	Comments
	Start	Stop					
Cat 4	0	131.35	0.0249	16	Hydrotest	3	Env Impacts, Residential,
Cat 4	131.35	35503.54	3.1277	16	Hydrotest	3	To Rainbow Comp Station
Cat 2	35503.54	35547.54	-	16	Keep As Is		
Cat 2	35547.54	36042.54	-	16	Keep As Is		Under San Louis Rey River
Cat 2	36042.54	36086.74	-	16	Keep As Is		
Cat 4	36086.74	122769	6.7856	16	Hydrotest	3	Env Impacts, Residential
Cat 1	122769	122909	0.0265	16	Keep As Is		Under Flood Control Channel
Cat 4	122909	153775	5.4108	16	Hydrotest	3	Env Impacts, Residential, Cultural
Cat 1	153775	156275	0.4735	14	Keep As Is		Under Lake Hodges
Cat 4	156275	173881	3.3345	16	Hydrotest	3	Env Impacts, Residential, Cultural, Wetlands
Cat 1	173881	175183	0.2466	16			
Cat 4	175183	177794.36	0.4946	16	Hydrotest	3	Env Impacts, Residential, Golf Course
Cat 1	177794.36	178116.36	0.0610	16			
Cat 1	178116.36	179625.84	0.2859	16			
Cat 4	179625.84	179666.84	0.0078	16	Hydrotest	3	Crossing I-15,
Cat 1	179666.84	179867	0.0379	16	Hydrotest		Env Impacts, Residential,
Cat 4	179867	192033.84	2.3043	16	Hydrotest	3	Golf Course
Cat 1	192033.84	194894.23	0.5417	16			
Cat 4	194894.23	196153.23	0.2384	16	Hydrotest	3	Crossing HWY 56, Env Impacts
Cat 1	196153.23	196664.23	0.0968	16	Keep As Is		Crossing Rancho Penquitos Blvd
Cat 4	196664.23	208213.02	2.1328	16	Hydrotest	3	Env Impacts, Residential
Cat 2	208213.02	208277.02	0.0121	16			
Cat 2	208277.02	208443.02	0.0314	16			
Cat 2	208443.02	210718.02	0.4309	16			
Cat 4	210718.02	210879.6	0.0306	16	Hydrotest	3	
Cat 1	210879.6	210910.6	0.0059	16	Hydrotest		
Cat 4	210910.6	210936.6	0.0049	16	Hydrotest	3	Crossing Mira Mesa Blvd
Cat 1	210936.6	211004.6	0.0129	16	Hydrotest		
Cat 1	211004.6	211113.3	0.0206	16	Hydrotest		

Cat 1	211113.3	211121.6	0.0016	16	Hydrotest	
Cat 4	211121.6	213847.38	0.5162	16	Hydrotest	3
Cat 1	213847.38	215298.38	0.2748	16		
Cat 4	215298.38	232320.68	2.0926	16	Hydrotest	3
Cat 1	232320.68	235917.16	-	16		
Cat 4	235917.16	236463.16	-	16		
Cat 1	236463.16	237083.16	-	16		
Cat 4	237083.16	238112.54	-	16		
Cat 1	238112.54	238311.54	-	16		
Cat 4	238311.54	239898.54	-	16		
Cat 1	239898.54	240443.54	0.0830	16		
Cat 1	240443.54	241072.54	0.1191	16		
Cat 1	241072.54	241553.54	0.0911	16		
Cat 4	241553.54	242797.54	0.2356	16	Hydrotest	3
Cat 1	242797.54	244019.54	0.2314	16		
Cat 1	244019.54	245140.54	0.2123	16		
Cat 4	245140.54	260092.56	2.7572	16	Hydrotest	3
Cat 4	260092.56	261324	0.2332	16	Hydrotest	3

Military Base - Miramar, Env Impacts, Residential

Industrial Area

Montgomery Field Airport, Env Impacts,  
School, Rec Center



SHEET: Sheet 1 of 1  
 DATE: July 26, 2011  
 SPEC Project Number: 5057  
 SPEC SERVICES, INC.  
 ESTIMATED BY: SPEC SERVICES, INC.  
 STATE OF DESIGN: Conceptual

DESCRIPTION	QUANTITY		UNIT	MATERIAL COST		LABOR COST		TOTAL COST	COMMENTS
	NUMBER			UNIT COST	TOTAL	UNIT COST	TOTAL		
<b>1 MATERIALS</b>									
INPUT IN ALL BLUE CELLS									
Pipe	16	Actual OD (in)							
	0.250	Wall Thickness (in)							
	238983	Length (FT)	Water Volume						
	13	QTY	Baker Tank Volume						
Hydrotest Test Segment	0	QTY							
Pipe	n/a	Actual OD (in)							
	0.000	Wall Thickness (in)							
	0	Length (FT)	Water Volume						
	0	QTY	Baker Tank Volume						
Hydrotest Test Segment	0	QTY							
Pipe	n/a	Actual OD (in)							
	0.000	Wall Thickness (in)							
	0	Length (FT)	Water Volume						
	0	QTY	Baker Tank Volume						
Hydrotest Test Segment	0	QTY							
Total Hydrotest Length	44.7	Miles							
Total Hydrotest Segment(s)	13	QTY							
Purging - Volume of Nitrogen [to obtain 3 atm (44 psig) on line], minimum 4 miles per test segment	1,079,318	SCF							
Temporary Pig Launcher/Receiver (one/ OD change)	1	LS							
Water Injection Pump & Filter (capacity 1200 gpm)	5	day(s)							
On-Site Vacuum Truck(s) (minimum one per/ test segment)	13	each							
Baker Tank(s) =X	9	each							
Total Baker Tank(s) Rental days (\$/day per tank) =>X*Z	796	day(s)							
Total Hydrotest Water (\$19/bbl)	55,050	bbl							
Water Disposal Vacuum Truck(s) =A	9	each							
Vacuum Truck Water Disposal loads (capacity 120 bbl) =B	489	loads							
Disposal Time =C*B/(A*10)	6	day(s)							
Total Vacuum Truck(s) Rental days (\$/day per truck) =D=C*A	54	day(s)							
Treated Water Disposal (\$55/bbl)	55,050	bbl							
Miscellaneous Materials	5	%							
SCG Post Estimate Changes									
Additional Baker Tanks:	0	QTY							
Additional Test Segments:	0	QTY							
(due to elevation changes)									
<b>2 CONSTRUCTION</b>									
Construction Labor (25K/ test segment)	13	LS							
Hydrotest Labor (10K/ test segment)	13	day(s)							
Dewater/ Dry Pipeline (\$15,000/ test segment)	13	LS							
Tie-ins Crew Rates (\$25,000/ test segment)	13	Each							
3rd Party Witness (\$2,000/ test segment)	13	Each							
Test/Construction period (6 days per test segment+ Hydrotest Labor+ Disposal Time) =Z	84	day(s)							
<b>Total Construction Cost</b>									
Projects <\$1 million - company labor is 10%	10	%							
\$1 million < Projects < \$10 million - company labor is 5%	5	%							
Projects >\$10 million - company labor is 2.5%	2.5	%							
<b>Total SCG Labor / Inspection Cost</b>									
<b>4 DESIGN / ENG. / CONST. / ENVIRON.</b>									
Planning / Design / Eng / Coord / Procurement	5	%							
ROW Acquisition	0	LS							
Construction Permits	0	LS							
Environmental Permits	0	LS							
Environmental Monitoring	0	LS							
<b>Total Design / Engineering / Construction Cost</b>									
Projects <\$2 million - Contingency is 30%	30	%							
Projects >\$2 million - Contingency is 20%	20	%							
<b>TOTAL PROJECT COST (See Appendix for assumptions/certifications)</b>									



**San Diego Gas & Electric**  
**Pipeline Safety Enhancement Program - Workpaper Supporting Chapter IX**

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**Company**            SDG&E  
**Plant Category**    Trans

*Summary of remaining pipelines*

<b>Line Number</b>	<b>Replacement Mileage</b>			<b>Capital Cost Detail</b>		
	<b>Category 4 Criteria</b>	<b>Accelerated</b>	<b>Total</b>	<b>Direct Labor</b>	<b>Direct Non Labor</b>	<b>Total Direct Capital</b>
3010	0.048	-	0.048	\$ -	\$ -	\$ -