



Risk Assessment and Mitigation Phase

(Chapter SCG-Risk-4-WP)

**Incident Related to the Storage System
(Excluding Dig-in)**

Workpapers

May 17, 2021

2021 RAMP
 SCG-Risk-4-WP
 Risks Recorded and Forecast Units Workpaper
 Tab: Incurred\$

RAMP Chapter ID	RAMP Chapter Name	Control / Mitigation ID	Control / Mitigation Name	RECORDED DOLLARS										FORECAST DOLLARS										Shared Allocations (Yes/No)			
				O&M					Capital					O&M					Capital								
				2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2022		2023		2024		2022		2023			2024		
														\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High		\$ Low	\$ High	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	\$ 9,081	\$ 10,872	\$ 7,585	\$ 6,903	\$ 13,413	\$ 47,955	\$ 61,253	\$ 57,852	\$ 40,818	\$ 66,676	\$ 14,834	\$ 17,957	\$ 14,834	\$ 17,957	\$ 14,834	\$ 17,957	\$ 87,907	#####	\$ 87,907	\$ 106,413	\$ 87,907	\$ 106,413	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C2	Well Abandonment and Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,682	\$ 9,455	\$ 36,394	\$ 23,981	\$ 14,926	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 42,742	\$ 51,740	\$ 48,442	\$ 58,640	\$ 29,442	\$ 35,640	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C3	Pressure Monitoring and Alarming	\$ 668	\$ 489	\$ 1,077	\$ 574	\$ 284	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 387	\$ 468	\$ 387	\$ 468	\$ 387	\$ 468	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	\$ 2,741	\$ 5,670	\$ 6,489	\$ 8,699	\$ 7,913	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C5	Storage Field Maintenance	\$ 32,557	\$ 31,071	\$ 29,911	\$ 30,892	\$ 36,295	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31,670	\$ 38,337	\$ 32,620	\$ 39,487	\$ 33,599	\$ 40,672	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C6	Compressor Overhauls	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,299	\$ 3,778	\$ 5,166	\$ 4,140	\$ 1,959	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,377	\$ 5,922	\$ 4,478	\$ 6,058	\$ 4,377	\$ 5,922	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C7	Upgrade to Purification Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,081	\$ 3,140	\$ 3,801	\$ 3,042	\$ 1,136	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,440	\$ 6,007	\$ 6,794	\$ 9,192	\$ 5,836	\$ 7,896	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	\$ -	\$ 118	\$ 9	\$ 32	\$ 1,801	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,960	\$ 3,640	\$ 1,890	\$ 3,510	\$ 1,330	\$ 2,470	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,233	\$ 4,933	\$ 987	\$ 4,933	\$ 987	\$ 4,933	\$ 7,076	\$ 28,305	\$ 5,661	\$ 28,305	\$ 5,661	\$ 28,305	No	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,420	\$ 4,370	\$ -	\$ -	\$ -	\$ -	No	
NOTES:																											
[1] The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2020 dollars and have not been escalated to 2021 amounts.																											
[2] Costs are provided, where available, for all activities regardless of whether a RSE analysis was performed.																											

2021 RAMP
SCG-Risk-4-WP
Risks Shared Allocations Workpaper
Tab: Shared Allocations
(2020 Direct \$000)

RAMP Chapter ID	RAMP Chapter Name	Control / Mitigation ID	Control / Mitigation Name	Shared Allocations			
				Retained	SDG&E	Sempra Energy	Other
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C2	Well Abandonment and Replacement	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C3	Pressure Monitoring and Alarming	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C5	Storage Field Maintenance	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C6	Compressor Overhauls	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C7	Upgrade to Purification Equipment	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	100%	0%	0%	0%
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	100%	0%	0%	0%

2021 RAMP
 SCG-Risk-4-WP
 Risks Recorded and Forecast Units Workpaper
 Tab: After Allocations\$

RAMP Chapter ID	RAMP Chapter Name	Control / Mitigation ID	Control / Mitigation Name	RECORDED DOLLARS										FORECAST DOLLARS													
				O&M					Capital					O&M					Capital								
				2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2022		2023		2024		2022		2023		2024			
														\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	\$ 9,081	\$ 10,872	\$ 7,585	\$ 6,903	\$ 13,413	\$ 47,955	\$ 61,253	\$ 57,852	\$ 40,818	\$ 66,676	\$ 14,834	\$ 17,957	\$ 14,834	\$ 17,957	\$ 14,834	\$ 17,957	\$ 87,907	#####	\$ 87,907	\$ 106,413	\$ 87,907	\$ 106,413		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C2	Well Abandonment and Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,682	\$ 9,455	\$ 36,394	\$ 23,981	\$ 14,926	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 42,742	\$ 51,740	\$ 48,442	\$ 58,640	\$ 29,442	\$ 35,640		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C3	Pressure Monitoring and Alarming	\$ 668	\$ 489	\$ 1,077	\$ 574	\$ 284	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 387	\$ 468	\$ 387	\$ 468	\$ 387	\$ 468	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	\$ 2,741	\$ 5,670	\$ 6,489	\$ 8,699	\$ 7,913	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C5	Storage Field Maintenance	\$ 32,557	\$ 31,071	\$ 29,911	\$ 30,892	\$ 36,295	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31,670	\$ 38,337	\$ 32,620	\$ 39,487	\$ 33,599	\$ 40,672	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C6	Compressor Overhauls	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,299	\$ 3,778	\$ 5,166	\$ 4,140	\$ 1,959	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,377	\$ 5,922	\$ 4,478	\$ 6,058	\$ 4,377	\$ 5,922		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C7	Upgrade to Purification Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,081	\$ 3,140	\$ 3,801	\$ 3,042	\$ 1,136	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,440	\$ 6,007	\$ 6,794	\$ 9,192	\$ 5,836	\$ 7,896		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	\$ -	\$ 118	\$ 9	\$ 32	\$ 1,801	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,960	\$ 3,640	\$ 1,890	\$ 3,510	\$ 1,330	\$ 2,470	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,233	\$ 4,933	\$ 987	\$ 4,933	\$ 987	\$ 4,933	\$ 7,076	\$ 28,305	\$ 5,661	\$ 28,305	\$ 5,661	\$ 28,305		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,420	\$ 4,370	\$ -	\$ -	\$ -	\$ -		
NOTES:																											
[1] The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2020 dollars and have not been escalated to 2021 amounts.																											
[2] Costs are provided, where available, for all activities regardless of whether a RSE analysis was performed.																											

2021 RAMP
 SCG-Risk-4-WP
 Risks Recorded and Forecast Units Workpaper
 Tab: Units

RAMP Chapter ID	RAMP Chapter Name	Control / Mitigation ID	Control / Mitigation Name	Units Description		RECORDED UNITS										FORECAST UNITS													
				Capital	O&M	O&M					Capital					O&M				Capital									
				2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2022		2023		2024		2022		2023		2024					
				Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High				
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	# of wells having undergone integrity assessment	# of wells having undergone integrity assessment	41	44	40	17	52	41	44	40	17	52	58	70	58	70	58	70	58	70	58	70	58	70		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C2	Well Abandonment and Replacement	# wells abandoned	N/A	-	-	-	-	-	3	3	20	38	9	-	-	-	-	-	-	-	-	8	9	8	9	8	9
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C3	Pressure Monitoring and Alarming	N/A	# storage wells with annulus monitoring	4	4	118	118	118	-	-	-	-	-	112	112	110	112	108	112	-	-	-	-	-	-	-	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	N/A	# storage wells subject to wellhead leak detection and repair activities	4	4	118	118	118	-	-	-	-	-	106	112	110	112	108	112	-	-	-	-	-	-	-	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C5	Storage Field Maintenance	N/A	No Feasible Units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C6	Compressor Overhauls	# of Storage Fields	N/A	-	-	-	-	-	5	5	5	5	5	-	-	-	-	-	-	-	-	4	6	4	6	4	6
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	C7	Upgrade to Purification Equipment	# of Storage Fields	N/A	-	-	-	-	-	4	4	4	4	4	-	-	-	-	-	-	-	-	4	4	4	4	4	4
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	N/A	# of Storage Fields	-	4	4	4	4	-	-	-	-	-	1	4	1	4	1	4	-	-	-	-	-	-	-	
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	Wells	N/A	-	-	-	-	-	-	-	-	-	-	5	20	4	20	4	20	5	20	4	20	4	20	4	20
SCG-Risk-4	Incident Related to the Storage System (Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	Monitors	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248	317	-	-	-	-