[redacted]

SUMMARY SHEET	2014 Results Per Company Filing (1)	Summary of Adjustments (2)	Test Year Adjusted Total (3)	Requested Reveune Increase (4)	Adjusted Reults After Proposed Revenues (5)
Operating Revenues					
1 Natural Gas Sales	65,785,175	422,139	66,207,314	756,009	66,963,323
2 Gas Transportation Revenue	4,029,534	0	4,029,534		4,029,534
3 Other Operating Revenues	277,779	0	277,779		277,779
4 SUBTOTAL	70,092,488	422,139	70,514,627	756,009	71,270,636
5 LESS: Nat. Gas/Production Costs	39,527,958	(385,502)	39,142,456		39,142,456
6 Revenue Taxes	2,905,229	8,802	2,914,031	15,763	2,929,794
7 **OPERATING MARGIN**	27,659,301	798,839	28,458,140	740,247	29,198,387
Operating Expenses					
8 Production	100,207	2,104	102,311		102,311
9 Distribution	5,413,835	514,824	5,928,659		5,928,659
10 Customer Accounts	1,516,549	415,601	1,932,150	3,612	1,935,762
11 Customer Service	250,477	(135,082)	115,395		115,395
12 Sales	505	(58,370)	(57,865)		(57,865)
13 Administrative and General	5,700,762	(471,158)	5,229,604		5,229,604
14 Depreciation & Amortization	4,880,058	479,942	5,360,000		5,360,000
15 Regulatory Debits		0	0		0
16 Taxes Other Than Income	1,870,615	259,862	2,130,477		2,130,477
17 State & Federal Income Taxes	2,399,137	(34,146)	2,364,991	294,212	2,659,203
18 **Total Operating Expenses**	22,132,145	973,578	[redacted]	[redacted]	23,403,546
19 **Net Operating Revenues**	5,527,156	(174,738)	[redacted]	[redacted]	5,794,841
Rate Base					
20 Total Plant in Service	180,947,303	9,292,590	190,239,893		190,239,893
21 Total Accumulated Depreciation	(85,852,430)	(2,679,971)	(88,532,401)		(88,532,401)
22 Contributions in Aid of Construction	0	0	0		0
23 Customer Adv. For Construction	(537,712)	0	(537,712)		(537,712)
24 Deferred Accumulated Income Taxes	(25,739,617)	6,116	(25,733,501)		(25,733,501)
25 Deferred Debits		0	0		0
26 Working Capital Allowance	2,198,523	(16,804)	2,181,719		2,181,719
27 **TOTAL RATE BASE**	71,016,067	6,601,931	77,617,998	0	77,617,998
28 **Rate of Return**	7.78%		6.90%		7.47%

[redacted]

1	Adjusted Rate Base	$77,617,998
2	Rate of Return	7.47%
3	Required Return (ln 1 x ln 2)	$5,794,960
4	Adjusted Net Income	$5,352,418
5	Required Net Income Increase (ln 3 - ln 4)	$442,542
6	Conversion Factor	0.58537
7	Revenue Increase Required (ln 5 / ln 6)	**$756,009**
8	Test Year Adjusted Revenue	$70,514,627
9	Overal Revenue Increase	**1.0721%**

Cascade Natural Gas
Conversion Factor Calculation
Twelve Months Ended December 31, 2014

REVENUE SENSITIVE COSTS

Revenues	1.00000
Operating Revenue Deductions	
Uncollectible Accounts	0.00478
Taxes Other - Franchise	0.01835
OPUC Fees	0.00250
Interest expense	
State Taxable Income	0.97437
State Income Tax	0.07381
Federal Taxable Income	0.90056
Federal Income Tax @ 35%	0.31520
Total Income Taxes	0.38901
Total Revenue Sensitive Costs	0.41463
Net-to-Gross Factor	**0.58537**

Combo-State & Federal Income Tax	
State	0.07600
Federal	0.35000
State and Federal Effective Tax Rate	0.3994

[redacted]

		Uncollectibles Expense (a)	Removal 25% Membership Fees (b)	Officer Incentive Comp. Adj (c)	Promotional Advertising Adjustment (d)	Interest Coordination Adjustment (e)
1	**Operating Revenues**					
2	Natural Gas Sales					
3	Gas Transportation Revenue					
4	Other Operating Revenues					
5	SUBTOTAL	**$0**	**$0**	**$0**	**$0**	**$0**
6	LESS: Nat. Gas/Production Costs					
7	Revenue Taxes					
8	**OPERATING MARGIN**	**$0**	**$0**	**$0**	**$0**	**$0**
9						
10	**Operating Expenses**					
11	Production					
12	Distribution					
13	Customer Accounts	$29,400				
14	Customer Service					
15	Sales				(58,370)	
16	Administrative and General		(3,648)	(135,107)		
17	Depreciation & Amortization					
18	Regulatory Debits					
19	Taxes Other Than Income					
20	State & Federal Income Taxes	(11,742)	1,457	53,962	23,313	49,282
21	**Total Operating Expenses**	17,658	(2,191)	(81,145)	(35,057)	49,282
22	**Net Operating Revenues**	($17,658)	$2,191	$81,145	$35,057	($49,282)
24	**Rate Base**					
25	Total Plant in Service					
26	Total Accumulated Depreciation					
27	Contributions in Aid of Construction					
28	Customer Adv. For Construction					
29	Deferred Accumulated Income Taxes					
30	Deferred Debits					
31	Working Capital Allowance					
32	**TOTAL RATE BASE**	$0	$0	$0	$0	$0
33						
34	**Revenue Requirement Effect**	**$30,165**	**($3,743)**	**($138,623)**	**($59,889)**	**$84,191**

PGA Commodity Sharing Adj. (f)	Annualizing Wage Rate Adjustment (g)	Removal of Retiree Medical Credits (h)	2015 Revenue Adjustment (i)	2015 Wage Adjustments (j)	Pension Asset Adjustment (k)	Pipeline Inspection Cost Adj (l)	Labor Additions Adjustment (m)	Public Purpose Cost Reallocation (n)
			$422,139					
$0	**$0**	**$0**	**$422,139**	**$0**	**$0**	**$0**	**$0**	**$0**
(385,502)								
0			8,802					
$385,502	**$0**	**$0**	**$413,337**	**$0**	**$0**	**$0**	**$0**	**$0**
						0	457,924	
$0			$2,017					
								(135,082)
	25,051	0		164,572				
153,970	(10,005)	0	164,281	(65,730)	0	0	(182,895)	53,952
153,970	15,046	0	166,298	98,842	0	0	275,029	(81,130)
$231,533	($15,046)	$0	$247,039	($98,842)	$0	$0	($275,029)	$81,130
						0		
$0	$0	$0	$0	$0	$0	$0	$0	$0
($395,535)	**$25,703**	**$0**	**($422,025)**	**$168,855**	**$0**	**$0**	**$469,842**	**($138,598)**

[redacted]

2015 Plant Additions (o)	Reallocation of A&G Charges (p)	Rate Case Costs (q)	Inflation Factor Adj (r)	Depreciation Expense Adj (s)	Employee Incentive Plan Adj (t)	Environmental Remediation Adj (u)	Gas Storage Adjustment (v)	General Expenses (w)	**Total Adjustments (Base Rates) (x)**
		$0	$0	$0	$0	$0	$0	$0	422,139
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$422,139**
									($385,502)
									$8,802
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	$798,839
									$0
									$0
			2,104						$2,104
			56,900			0			$514,824
	$352,337		31,848						$415,601
			0						($135,082)
									($58,370)
	(474,566)	186,275	69,222		(98,091)			(204,866)	($471,158)
479,942				0					$479,942
									$0
137,633	122,229								$259,862
(246,659)	0	(74,398)	(63,933)	0	39,178	0	0	81,823	($34,146)
370,915	0	111,877	96,140	0	(58,913)	0	0	(123,042)	$973,578
($370,915)	$0	($111,877)	($96,140)	$0	$58,913	$0	$0	$123,042	($174,738)
9,292,590									$9,292,590
(2,679,971)									($2,679,971)
									$0
									$0
6,116									$6,116
									$0
							(16,804)		($16,804)
$6,618,735	$0	$0	$0	$0	$0	$0	($16,804)	$0	$6,601,931
$1,477,829	**$0**	**$191,123**	**$164,240**	**$0**	**($100,644)**	**$0**	**($2,143)**	**($210,197)**	**$1,140,550**

Cascade Natural Gas Corporation
Interest Coordination Adjustment
1-14 to 12-14

OREGON:

Rate Base 12/31/2014	Avg Cost of Debt	Subtotal	Test period Interest Expense	Adjustment	State and F.I.T.	**Total Adjust**
77,617,998	2.60%	2,014,187	2,137,578	(123,391)	0.39940	**49,282**

FERC		
427.0	2,090,629	Interest on Debt
428.0	37,633	Amort. of Debt Discount and Exp.
428.1	9,317	Amort. of Loss on Reacquired Debt
	2,137,578	

Note: The rate base component comes from Exhibit CNG/701, column 5, row 27

CASCADE NATURAL GAS CORPORATION
Oregon Public Utility Commission
Standard Data Requests

Request No. 243

Date prepared: August 24, 2015

Preparer: Mike Parvinen

Contact: Pamela Archer

Telephone: (509)-734-4591

243. In reference to SDR #104, please provide complete answers to 104a, 104b, 104c, 104d, and 104f using 2014 actual expenses.

Revised Response:

The revision provided a correction of two items in the tab labeled A243-244 that were previously identified as category C and are actually Category A expenses. The Value Pak inserts were 811 reminders and other safety tips that were distributed to all customers.

CASCADE NATURAL GAS CORPORATION
Citizens' Utility Board of Oregon
Standard Data Requests
UG 287

CUB Request No. 29

Date prepared: July 29, 2015

Preparer: Becky Mellinger

Contact: Pamela Archer

Telephone: (509)734-4591

CUB DR 29 TO CASCADE

CNG/100/Madison/4 line 10: Please provide a copy of the 5-year capital budget.

Response:

See PDF file CUB 29_A.pdf

MDU Utilities Groups

Amounts in $'s	2015	2016	2017	2018	2019
00047-Cascade Natural Gas Co.	**$63,579,136**	**$98,303,692**	**$89,408,623**	**$45,439,865**	**$41,946,811**
(NONE)	**$63,579,136**	**$98,303,692**	**$89,408,623**	**$45,439,865**	**$41,946,811**
FP-101164 - GP COMM EQUIP - INTERSTATE	$357,619	$337,502	$347,627	$358,055	$0
FP-101170 - MAIN-GROWTH-OREGON	$489,544	$496,887	$504,340	$511,905	$519,584
FP-101171 - MAIN-REINFORCE-OREGON	$122,853	$122,853	$122,853	$122,853	$122,853
FP-101172 - MAIN-RELO-REPL-OREGON	$339,192	$542,780	$542,780	$542,780	$542,780
FP-101173 - R STA-GROWTH-OREGON	$108,253	$76,564	$78,861	$81,227	$81,227
FP-101175 - R STA-RELO-REPL-OREGON	$122,687	$124,527	$126,395	$128,291	$130,215
FP-101176 - SERV-GROWTH-OREGON	$1,146,321	$1,202,849	$1,244,952	$1,288,527	$1,288,527
FP-101180 - IND M&R-GROWTH-OREGON	$98,197	$104,178	$107,303	$110,523	$110,523
FP-101181 - IND M&R-REMOVE&REPLACE-OREGON	$49,315	$40,951	$40,951	$40,951	$40,951
FP-101184 - GP TRAN. VEHICLE - OREGON	$709,846	$433,550	$287,416	$356,049	$177,156
FP-101186 - GP POWER EQUIP - OREGON	$287,968	$226,859	$176,904	$118,077	$123,527
FP-101190 - MAIN-GROWTH-WASHINGTON	$979,087	$993,774	$1,008,680	$1,023,810	$1,039,168
FP-101191 - MAIN-REINFORCE-WASHINGTON	$342,199	$307,262	$307,262	$318,018	$318,018
FP-101192 - MAIN-RELO-REPL-WASHINGTON	$1,180,130	$1,180,130	$1,180,130	$1,221,439	$1,221,439
FP-101194 - R STA-GROWTH-WASHINGTON	$288,674	$306,255	$315,442	$324,905	$324,905
FP-101196 - R STA-RELO-REPL-WASHINGTON	$294,689	$491,410	$491,410	$491,410	$491,410
FP-101197 - SERV-GROWTH-WASHINGTON	$3,439,938	$3,491,537	$3,543,910	$3,597,069	$3,651,025
FP-101200 - IND M&R-GROWTH-WASHINGTON	$432,069	$458,381	$472,133	$486,321	$486,321
FP-101201 - IND M&R-REMOVE&REPL-WASHINGTO	$122,853	$122,853	$122,853	$122,853	$122,853
FP-101202 - GP BUILDINGS - WASHINGTON	$10,818	$0	$0	$0	$0
FP-101204 - GP TRAN. VEHICLE - WASHINGTO	$895,392	$2,134,505	$938,627	$641,420	$721,307
FP-101206 - GP POWER EQUIP - WASHINGTON	$349,031	$406,197	$298,853	$283,707	$289,157
FP-101209 - INTANGIBLES - SOFTWARE	$129,262	$0	$0	$0	$0
FP-101210 - PRE-CAP MTR-GROWTH-INTERSTAT	$1,760,984	$1,598,362	$1,646,314	$1,695,703	$1,695,703
FP-101215 - GP TRAN. VEHICLE - INTERSTAT	$145,675	$421,037	$101,821	$59,856	$210,829
FP-101216 - GP TOOLS - INTERSTATE	$202,146	$0	$0	$0	$0
FP-101218 - GP TOOLS - BEND	$49,763	$0	$0	$0	$0
FP-101234 - GP BUILDINGS - PENDLETON	$38,945	$0	$0	$0	$0
FP-101237 - GP TOOLS - PENDLETON	$17,309	$21,636	$21,636	$21,636	$21,636
FP-101255 - GP TOOLS - ONTARIO	$29,533	$0	$0	$0	$0
FP-101259 - PRE-CAP REG-GROWTH-INTERSTAT	$263,204	$279,234	$287,610	$296,239	$296,239
FP-101261 - GP TOOLS - WENATCHEE	$5,734	$0	$0	$0	$0
FP-101285 - GP BUILDINGS - BELLINGHAM	$59,500	$0	$0	$0	$0
FP-101286 - GP OFFICE EQUIP - BELLINGHAM	$5,409	$0	$0	$0	$0

MDU Utilities Groups

Amounts in $'s	2015	2016	2017	2018	2019
FP-101288 - GP TOOLS - BELLINGHAM	$78,648	$0	$0	$0	$0
FP-101307 - GP TOOLS - MT VERNON	$30,832	$0	$0	$0	$0
FP-101323 - GP BUILDINGS - BREMERTON	$75,727	$0	$0	$0	$0
FP-101326 - GP TOOLS - BREMERTON	$111,426	$0	$0	$0	$0
FP-101344 - GP TOOLS - LONGVIEW	$43,337	$0	$0	$0	$0
FP-101359 - GP BUILDINGS - ABERDEEN	$35,159	$0	$0	$0	$0
FP-101362 - GP TOOLS - ABERDEEN	$22,610	$0	$0	$0	$0
FP-101398 - GP TOOLS - TRI - CITIES	$11,034	$0	$0	$0	$0
FP-101416 - GP TOOLS - WALLAWALLA	$7,789	$0	$0	$0	$0
FP-101449 - GP BUILDINGS - YAKIMA	$4,544	$0	$0	$0	$0
FP-101451 - GP TOOLS - YAKIMA	$4,111	$0	$0	$0	$0
FP-101472 - UG-INSTALL WORK MGT-GLE	$325,338	$190,896	$250,443	$0	$0
FP-101478 - AUTOMATED VEHICLE LOCATION SYS	$112,007	$112,087	$0	$0	$0
FP-101479 - UG MWM PROJECT - CNGC SHARE	$195,808	$43,272	$205,544	$0	$0
FP-101480 - UG WAM PROJECT - CNGC SHARE	$0	$291,497	$179,773	$191,685	$118,809
FP-101481 - UG GPSLS PROJECT - SOFTWARE	$28,923	$22,400	$179,877	$0	$0
FP-101505 - ARLINGTON GATE UPGRADE	$0	$2,466,081	$0	$0	$0
FP-101510 - UG GMS PURCHASE SOFTWARE	$110,086	$0	$0	$0	$0
FP-200059 - RF 6" PE MN @ YAKIMA AIRPORT	$192	$84	$0	$0	$0
FP-200064 - IVR-WEB IMPLEMENTATIION - DRCT	$257,382	$274,437	$0	$0	$0
FP-200076 - MN - HANFORD DOE PRELIMINARY	$2,460,855	$31,340,623	$29,880,350	$0	$0
FP-200080 - RPL 8" STEEL HP SHELTON	$8,869,521	$0	$0	$0	$0
FP-200122 - RP; R-58, ABERDEEN	$35,802	$0	$0	$0	$0
FP-200130 - RF; 12" HP, SHELTON	$0	$9,911,336	$0	$0	$0
FP-200155 - UG GPSLS PROJECT - HARDWARE	$332	$0	$0	$0	$0
FP-200162 - RPL; 4" STEEL HP MAIN, PASCO	$84,396	$0	$0	$0	$0
FP-200179 - R-166, MOUNT VERNON	$1,123	$0	$0	$0	$0
FP-200282 - R STA - SUN RIVER GATE UPGRADE	$2,317,813	$0	$0	$0	$0
FP-200352 - CC&B COSTS	$1,622,715	$1,081,810	$0	$0	$0
FP-200394 - RPL 10" SQUALICUM CRK EXPOSURE	$0	$902,108	$0	$0	$0
FP-200661 - DATA CENTER/NETWORKING EQUIP	$96,065	$81,136	$81,136	$81,136	$0
FP-200662 - PC SUPPORT EQUIPMENT	$508,451	$189,317	$189,317	$189,317	$0
FP-200663 - UG GIS ENHANCEMENTS CNG DIRECT	$668,571	$649,086	$129,817	$64,909	$64,909
FP-200686 - CRM RPL LONGVIEW BARE STEEL	$2,369,463	$2,696,788	$2,999,377	$0	$0
FP-200687 - CRM RPL ANACORTES BARE STEEL	$2,381,030	$2,538,805	$326,004	$347,606	$370,639
FP-200688 - BEND PIPE REPL	$2,450,964	$2,640,243	$2,815,193	$3,001,737	$3,200,642

MDU Utilities Groups

Amounts in $'s	2015	2016	2017	2018	2019
FP-200689 - RPL 12" BEND HP LINE #1	$1,551	$1,860,029	$0	$0	$0
FP-200691 - CRM REL ZILLAH @ MEYERS BRIDGE F	$763	$0	$0	$0	$0
FP-300233 - ARLINGTON 6" HP REINFORCEMENT	$0	$1,765,680	$0	$0	$0
FP-300234 - YAKIMA 8" HP REINFORCEMENT	$0	$0	$3,716,751	$0	$0
FP-300334 - MN, 4" STEEL HP, MOUNT VERNON	$338	$0	$0	$0	$0
FP-300336 - R-167, MOUNT VERNON	$367	$0	$0	$0	$0
FP-300337 - R-168, MOUNT VERNON	$517	$0	$0	$0	$0
FP-300338 - MN 6" HP STEEL, MT VERNON	$6	$0	$0	$0	$0
FP-300346 - RPL; 12" STEEL HP, KELSO	$0	$1,476,307	$1,995,933	$2,339,092	$2,494,088
FP-300363 - RPL; 2:PE MAIN, SHELTON	$53	$1,683,934	$1,683,934	$1,683,934	$1,683,934
FP-301808 - UG-Routing Software - Survey System	$0	$0	$79,037	$0	$0
FP-301811 - WR-GAS SCADA Cyber Security	$166,829	$0	$0	$0	$0
FP-301813 - WR-GAS SCADA Enhancements	$233,259	$127,467	$46,485	$49,444	$52,841
FP-302000 - Baker City Office Purchase	$43,272	$0	$0	$0	$0
FP-302369 - GB - GROUNDBED WASHINGTON	$1,347,884	$967,059	$967,059	$967,059	$967,059
FP-302370 - GB - GROUNDBED OREGON	$426,546	$360,843	$360,843	$360,843	$360,843
FP-302571 - CC&B Upgrade	$0	$504,035	$1,578,427	$0	$0
FP-302574 - CC&B Betterment	$0	$0	$0	$1,545,028	$0
FP-302579 - PII - Personal Info Security	$115,614	$41,758	$27,477	$0	$0
FP-302587 - WALLA WALLA 6" HP REINFORCEMENT	$79,918	$0	$0	$0	$0
FP-302588 - HILDEBRAND BLVD 6" HP MAIN	$820,770	$0	$0	$0	$0
FP-302594 - KELSO BARE STEEL REPLACEMENT	$0	$0	$0	$0	$2,477,834
FP-302595 - KITSAP PH V	$0	$619,459	$6,235,632	$0	$0
FP-302596 - 8" ATTALIA HP LINE REPLACEMENT	$0	$1,238,917	$1,568,795	$1,920,532	$2,047,792
FP-302609 - Business Intelligence	$0	$0	$0	$315,186	$178,478
FP-302613 - PowerPlan Upgrade	$0	$0	$0	$315,186	$0
FP-302616 - Human Capital Management	$35,693	$59,452	$0	$0	$0
FP-302621 - LV Customer Website	$11,842	$0	$0	$0	$0
FP-302626 - ECM Upgrade	$68,388	$0	$0	$0	$0
FP-302640 - 6" PILOT ROCK HP REPLACEMENT	$0	$495,567	$0	$0	$0
FP-302641 - 4" PILOT ROCK IP REINFORCEMENT	$0	$495,567	$0	$0	$0
FP-302645 - MCCLEARY GATE HEATER	$266,715	$0	$0	$0	$0
FP-302648 - SOUTHRIDGE GATE STATION	$1,182,085	$0	$0	$0	$0
FP-302650 - O-4 UMATILLA	$206,223	$0	$0	$0	$0
FP-302651 - O-6 ATHENA	$211,111	$0	$0	$0	$0
FP-302652 - BREMERTON R-26 RELOCATE	$366,685	$0	$0	$0	$0

MDU Utilities Groups

Amounts in $'s	2015	2016	2017	2018	2019
FP-302653 - BREMERTON R-64 REPLACE/RELOCAT	$0	$192,032	$0	$0	$0
FP-302656 - PENDLETON R-9 REPLACEMENT	$208,138	$0	$0	$0	$0
FP-302663 - CRM BELLINGHAM BRIDGE CROSSING	$983,565	$0	$0	$0	$0
FP-302664 - CRM WENATCHEE RIV. RR BRIDGE IP F	$1,190,194	$0	$0	$0	$0
FP-302665 - RICHLAND 4" IP CANAL/HWY CROSSIN	$360,935	$0	$0	$0	$0
FP-302666 - MT. WASHINGTON BRIDGE CROSSING	$0	$464,594	$0	$0	$0
FP-302668 - AMERICAN LANE BRIDGE CROSSING	$0	$309,729	$0	$0	$0
FP-302670 - BREMERTON R-47 RELOCATE	$147,295	$0	$0	$0	$0
FP-302672 - BREMERTON R-146 RELOCATE	$571,852	$0	$0	$0	$0
FP-302705 - BREMERTON V-22 REPLACEMENT	$213,312	$0	$0	$0	$0
FP-302713 - CHICO CHECK METER	$0	$216,810	$0	$0	$0
FP-302714 - PENDLETON V-23 REPLACEMENT	$67,109	$166,709	$0	$0	$0
FP-302715 - 16" N. WHATCOM VALVE VAULT	$151,968	$0	$0	$0	$0
FP-302724 - MCCLEARY GATE UPGRADE	$2,291,996	$0	$0	$0	$0
FP-303140 - YAKIMA BARE STEEL REPLACEMENT	$0	$0	$0	$2,415,888	$2,575,972
FP-303141 - MILTON-FREEWATER BARE STEEL REF	$0	$1,889,348	$2,014,543	$2,148,033	$0
FP-303142 - PENDLETON BARE STEEL REPLACEME	$0	$1,982,267	$2,113,618	$2,253,673	$2,403,009
FP-304020 - BELLINGHAM GATE UPGRADE	$1,285,419	$0	$0	$0	$0
FP-304022 - CRM 4" GRANDVIEW HP LINE #3 RPL	$1,207,944	$0	$0	$0	$0
FP-305740 - CRM College Place CARS Project	$2,951,026	$0	$0	$0	$0
FP-305780 - EMSION CNTRL EQU ON COMP STA	$457	$0	$0	$0	$0
FP-306601 - 4" PE Main Walla Walla	$119	$0	$0	$0	$0
FP-306840 - Remodel the Moses Lake CNG facility	$142,945	$0	$0	$0	$0
FP-306935 - Gas Analytics	$13,549	$138,666	$0	$0	$0
FP-306967 - District Office Access Control Sys	$334,285	$22,151	$0	$0	$0
FP-306980 - ERT Replacement	$0	$0	$7,799,993	$0	$0
FP-306981 - MCCLEARY 2" IP REINFORCEMENT	$0	$0	$334,508	$0	$0
FP-306982 - CRM VANCE CREEK EXPOSURE REPLA	$83,606	$1,147,906	$0	$0	$0
FP-306983 - CRM CAMP CREEK EXPOSURE REPLA	$86,050	$1,129,342	$0	$0	$0
FP-306984 - STANWOOD REINFORCEMENT	$0	$0	$117,697	$0	$0
FP-306985 - SEDRO WOOLLEY IP REINFORCEMENT	$0	$105,308	$0	$0	$0
FP-306986 - CRM 3" BURLINGTON HP LINE REPL	$49,120	$839,524	$0	$0	$0
FP-306987 - BURLINGTON REIN. @ PETERSON RO/	$0	$0	$297,340	$0	$0
FP-306988 - WALLA WALLA HP LINE	$0	$0	$1,610,592	$0	$0
FP-306989 - UMATILLA 2" REINFORCEMENT	$0	$0	$0	$619,459	$0
FP-306990 - PENDLETON 4" IP REINFORCEMENT	$0	$495,567	$0	$0	$0

MDU Utilities Groups

Amounts in $'s	2015	2016	2017	2018	2019
FP-306991 - PENDLETON 4" HP REINFORCEMENT	$0	$0	$0	$0	$371,675
FP-306992 - PENDLETON KORVOLA ROAD 4" PE RE	$0	$0	$0	$495,567	$0
FP-306993 - PORT ORCHARD 4" PE REINFORCEMEI	$0	$204,421	$0	$0	$0
FP-306994 - MANCHESTER 4" PE REINFORCEMENT	$0	$0	$247,783	$0	$0
FP-306995 - OTHELLO REYNOLDS RD REINFORCEI	$0	$361,764	$0	$0	$0
FP-306996 - CRM KELSO MILL STREET REPLACEME	$158,452	$0	$0	$0	$0
FP-306997 - 4" MADRAS HP LINE REPLACEMENT	$0	$619,459	$660,506	$704,273	$750,940
FP-306998 - NEW SOUTH WALLA WALLA GATE	$0	$0	$3,097,292	$0	$0
FP-306999 - V-13 BREMERTON REPLACEMENT	$0	$153,571	$0	$0	$0
FP-307002 - V-9 ABERDEEN REPLACEMENT	$0	$204,421	$0	$0	$0
FP-307003 - CRM DAKOTA CREEK BRIDGE RELOCA	$1,022,679	$0	$0	$0	$0
FP-307020 - Longview - New Operations Bldg 2015	$454,056	$1,286,793	$0	$0	$0
FP-307024 - CRM SUNNYSIDE 2" IP MAIN RPL	$284,285	$0	$0	$0	$0
FP-307025 - CRM SHELTON 4" IP BRIDGE REPLACE	$287,887	$0	$0	$0	$0
FP-307026 - ONTARIO 6" IP REPLACEMENT	$303,175	$0	$0	$0	$0
FP-307027 - CRM BREMERTON HWY 3 CASING REI	$200,951	$0	$0	$0	$0
FP-307044 - Aberdeen New Operations Building 20	$227,028	$1,277,319	$0	$0	$0
FP-307181 - OLSON ROAD 6" PE REINFORCEMENT	$739,104	$0	$0	$0	$0
FP-307211 - SILVERDAE REINFORCEMENT AT HWY	$0	$1,079,264	$0	$0	$0
FP-307212 - CRM KELSO GRADE ST BRIDGE RELOC	$312,508	$0	$0	$0	$0
FP-307213 - WOODLAND ROUNDABOUT FORCED R	$216,810	$0	$0	$0	$0
FP-307221 - 8" YAKIMA HP PIPELINE	$0	$929,188	$1,300,488	$1,386,662	$0
FP-307225 - RIVER ROAD REINFORCEMENT	$371,675	$0	$0	$0	$0
FP-308022 - ERT Replacement - 2018	$0	$0	$0	$7,799,993	$0
FP-308023 - ERT Replacment 2019	$0	$0	$0	$0	$7,799,993
FP-309001 - 2 IN STEEL IP BORE BELFAIR PL	$138,712	$0	$0	$0	$0
FP-309300 - REPLACE O-3 HERMISTON	$174,005	$0	$0	$0	$0
FP-309301 - YAKIMA TRAINING FACILITY	$564,300	$37,392	$0	$0	$0
	$63,579,136	**$98,303,692**	**$89,408,623**	**$45,439,865**	**$41,946,811**

CASCADE NATURAL GAS CORPORATION
Citizens' Utility Board of Oregon
Standard Data Requests
UG 287

CUB Request No. 11

Date prepared: 7/29/2015

Preparer: Renie Sorensen

Contact: Pamela Archer

Telephone: (509)-734-4591

CUB DR 11 TO CASCADE

Cascade's response to OPUC Staff DR 184: Please provide data, results and interpretation of all DIMP analysis on pipe replacement since 2011

Response:

Please see the four files entitled "CUB 11 - Copy of Bend Data and Results Main.xlsx" for the years 2011 – 2014. Also see the map of the DIMP results in the files entitled "CUB 11 - Bend DIMP map Run.pdf".

Title: **Distribution Integrity Management**

Department: Engineering

Procedure Number: **3451.2** Revision Date: July 15th, 2013

Revision Summary

Second Revision remove references to integrated standards numbers that were not implemented, a revision summary is in Appendix I

References:

Regulations

CFR 492 – Part 192 – Subpart P … Gas Distribution Integrity Management (IM)

Procedures

Leak Survey
Material and/or Component Failure

Programs

Distribution Integrity Management Program
Damage Prevention Program
Public Awareness Program

Forms

21760 … Additional or Accelerated Action Implementation
21761 … DIMP Review Summary
21762 … Subject Matter Expert Interview/Input
21763 …GIS Validation
21764 … SME Panel Decisions

REVISION CONTROL SHEET

Document Number: 3451.2

Title: Distribution Integrity Management Program

Document Location: Company Policies and Procedures (General Office Engineering)

Revision	Date	Comments
1	3/15/2013	Revisions to this plan were made as a result of a three state DIMP audit with Oregon, Washington and Idaho conducted on August 21-22, 2012. A summary of the revision is located in Appendix I.
2	7/15/2013	Revisions to this plan were made for a change in corporate plans to not roll out integrated standards with the new numbering system.

Table of Contents

1.0 INTRODUCTION

1.1 Overview

This Distribution Integrity Management Plan (Plan) will be used by Montana Dakota Utilities (MDU), Great Plains Natural Gas (GPNG), Intermountain Gas Company (IGC) and Cascade Natural Gas Corporation (CNGC) to meet the requirements of a Distribution Integrity Management Program (Program) as outlined by CFR Part 192, Subpart P. MDU, GPNG, IGC and CNGC are subsidiary companies operating under Montana Dakota Utility Resources and will be referred to as the "Company" throughout this Plan.

1.2 Purpose

The Company's Program includes all appropriate operating, maintenance and pipeline safety practices routinely performed in addition to the activities described in this written Plan. The Plan establishes the requirements and responsibilities necessary to ensure that the integrity management of natural gas distribution facilities owned and operated by the Company is performed in accordance with Subpart P of 49 CFR Part 192 - Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (Code). The Company's objective is to operate, maintain, and manage all of its natural gas distribution facilities in a safe and responsible manner without failures or other incidents that could affect public or employee safety, or that could generate service interruptions.

1.3 Scope

All Company operated gas distribution facilities, as defined in §192.3 of the Code, including mains, service lines, service regulators, district regulating facilities, high pressure distribution systems and low pressure distribution systems are subject to the Company's Program.

The Company's specific system facilities are identified in accordance with Section 2.0 of the Plan.

1.4 Program Elements

Seven elements have been identified as the essential components of the Company Program and are discussed in more detail throughout this Plan. These seven elements are as follows:

1) Demonstrate knowledge of distribution system
2) Identify threats
3) Evaluate and prioritize risk
4) Identify and implement measures to address risks
5) Measure performance, monitor results and evaluate effectiveness
6) Perform periodic evaluation and improvement
7) Report results

Distribution integrity management is a comprehensive and continuous process that requires the integration of data, processes and operational knowledge. The process shown in Figure 1.1 will be used by the Company to meet the requirements of the seven Program elements.

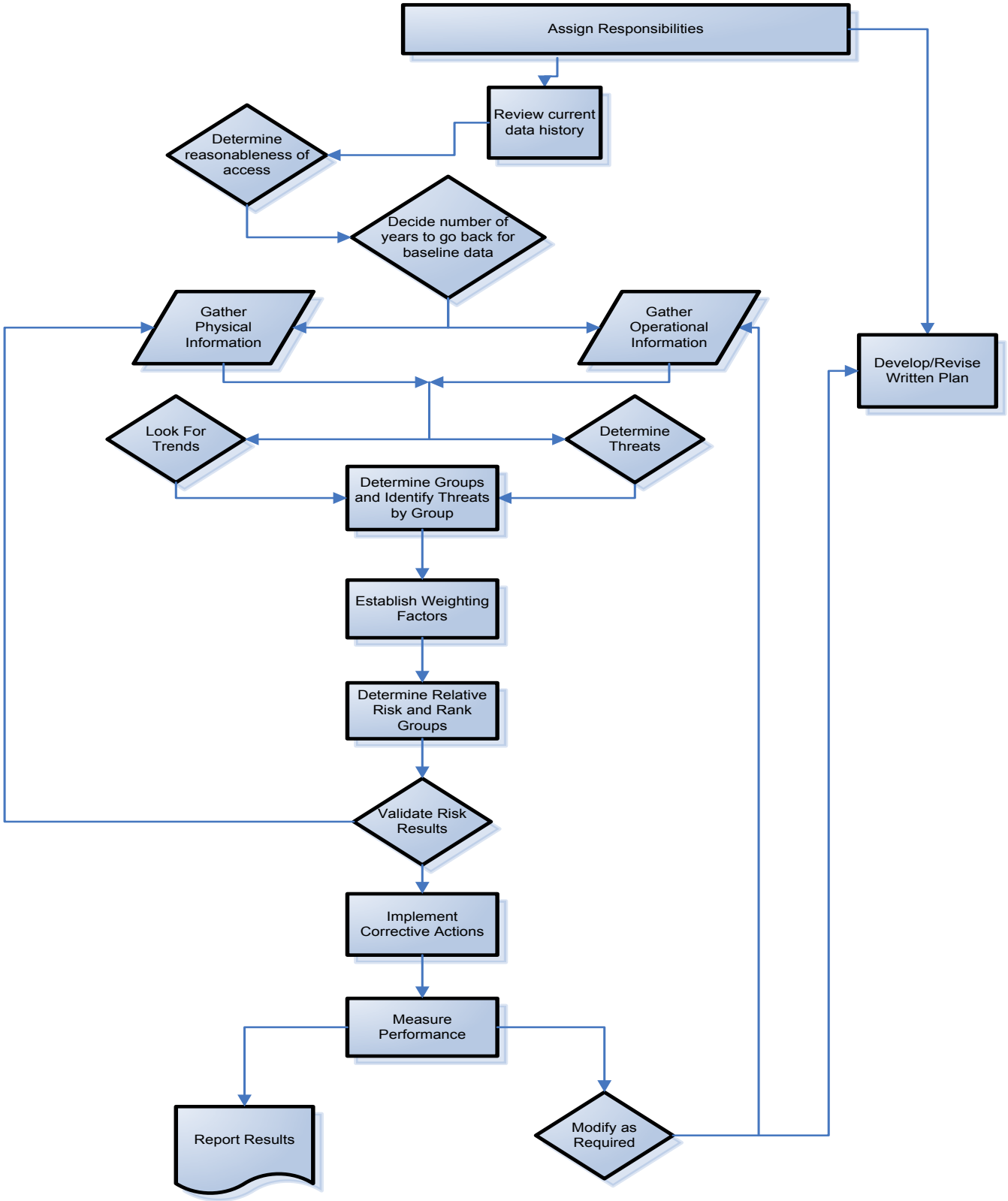


Figure 1.1: Distribution Integrity Management Program Process

1.5 Plan Appendices

This plan will consist of appendices specific to each Company. Information within each appendix will be compiled and updated by GO Engineering. Company appendices shall be reviewed annually for necessary updates. Information in appendices will be year specific and a copy of the current plan and current year appendices will be saved in a yearly plan edition. This plan edition will be compiled and stored by GO Engineering at each operating company. Annual updates shall be completed by March 31 and will be valid for one year.

1.6 Subject Matter Expert Involvement

Subject Matter Experts (SME) will be consulted throughout all sections of this plan. GO Engineering is responsible to qualify SMEs used in the Company's Program and provide documentation in Appendix G – *Subject Matter Expert*. SMEs may be consulted with regard to operational knowledge of distributions systems, threat identification, risk evaluation and ranking, and risk mitigation. Two types of SMEs will be utilized in this Program, Isolated SME and SME Panel.

1.6.1 Isolated Subject Mater Expert

Isolated SMEs will be used to identify and assess localized risk. Localized risk may apply to specific facilities, events or knowledge acquired through day to day operations and maintenance activities. Isolated SME information will be documented using Form 21762 which summarizes:

- Interview Date
- SME Information
- SME Experience
- Summary of Interview
- SME Signature

1.6.2 Subject Matter Expert Panel

The SME Panel will consist of selected individuals appointed by GO Engineering. The panel will be consulted to assist in making company decisions concerning the performance of the risk model, risk model scoring and weighting, threat subdivision and risk mitigation. SME Panel meetings shall be documented in the Appendix G - *Subject Matter Expert* and SME Panel decisions will be documented using form 21764: SME Panel Decisions; which will include at a minimum:

- Date of Panel Meeting
- Name (s) of SME Panel Members and Bios
- Objectives for Panel Meeting
- Decisions made by SME Panel
- Signatures of SME Panel Members

1.7 Definitions

1. **Code** – Code of Federal Regulations (CFR) 49, Part 192, Subpart P
2. **Company** – Montana Dakota Utilities, Great Plains Natural Gas, Intermountain Gas Company and Cascade Natural Gas Corporation
3. **DIMP** – Distribution Integrity Management Program
4. **GIS –** Geographical Information System
5. **Hazardous Leak** - leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous
6. **Transmission Pipeline** – A natural gas pipeline, other than a gathering line, that fits one of the following criteria:
    - Operates at a hoop stress of 20% or more of SMYS
    - Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center
    - Transports gas within a storage field
7. **Distribution Pipeline** – A natural gas pipeline other than a transmission or gathering line
8. **Subject Matter Expert (SME)** – Any individual knowledgeable about design, construction, operations, or maintenance activities, or the system characteristics of a particular distribution system. Designation as an SME does not necessarily require specialized education or advanced qualifications, some SMEs may possess these characteristics, but detailed knowledge of the pipeline system gained by working with it over time can also make someone an SME. SMEs may be employees, consultants, or contractors, or any appropriate combination.
9. **Specified Minimum Yield Strength (SMYS) –** The minimum yield strength of a steel pipeline in accordance with a listed specification or in accordance with 192.107
10. **Maximum Allowable Operating Pressure (MAOP) –** The maximum pressure at which a pipeline or segment may operate
11. **Plan –** Written document describing actions the Company will take to satisfy the requirements of a Distribution Integrity Management Program (CFR 192 Subpart P)
12. **Program –** The actions and/or activities the Company will take to satisfy the requirements of CFR 192 Subpart P

1.8 Responsibilities

1.8.1 IGC and CNGC

Responsibilities associated with the Program for IGC and CNGC are listed below. The Distribution Integrity Management Organization Structures for IGC and CNGC are shown in Figures 1.2 and 1.3 respectively.

1.8.1.1 Vice President of Operations

- Monitor the implementation and continuance of the Plan

- Ensure adequate budget and personnel are committed to effectively pursue the purpose of the Plan
- Perform oversight of the Plan
- Approve the Plan
- Approve changes to the Plan

1.8.1.2 Management Personnel

The Director of Engineering Services and the Director – Operations Services are responsible to:

- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed
- Program Approval

1.8.1.3 General Office (GO) Engineering

- Perform day-to-day implementation and management of Plan
- Communicate Plan requirements and activities to both Management and Regional Personnel
- Perform the documentation and communication responsibilities specified in the Plan
- Supervise service providers as necessary
- Review and make updates to the Plan as necessary or required

1.8.1.4 Regional Directors

- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed

1.8.1.5 Operations/District Managers

- Perform the documentation and communication responsibilities specified in this Plan
- Supervise service providers as necessary

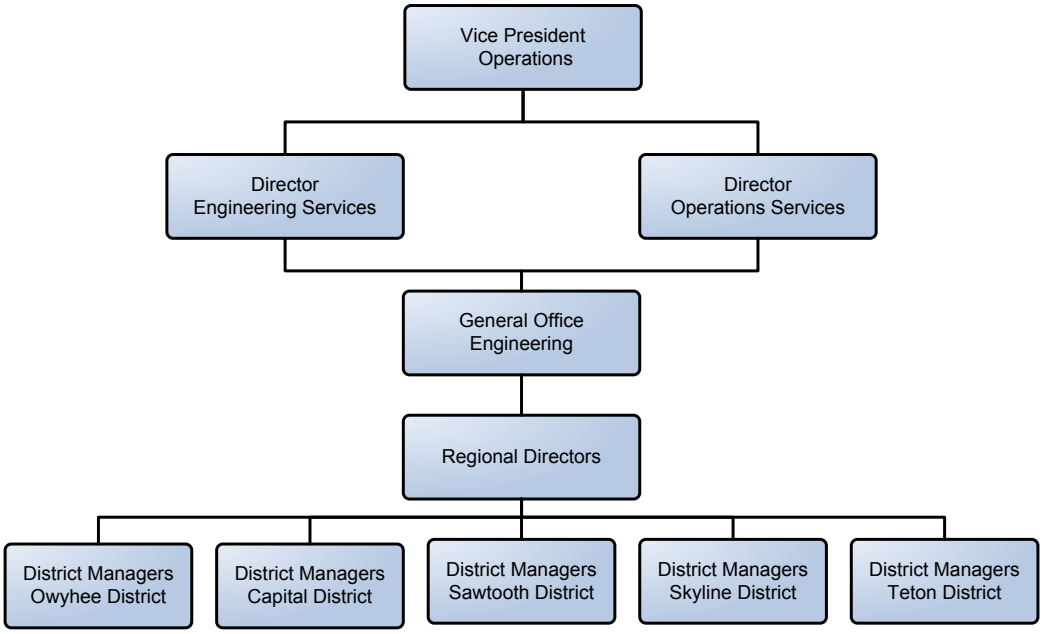


Figure 1.2: IGC Distribution Integrity Management Organization Structure

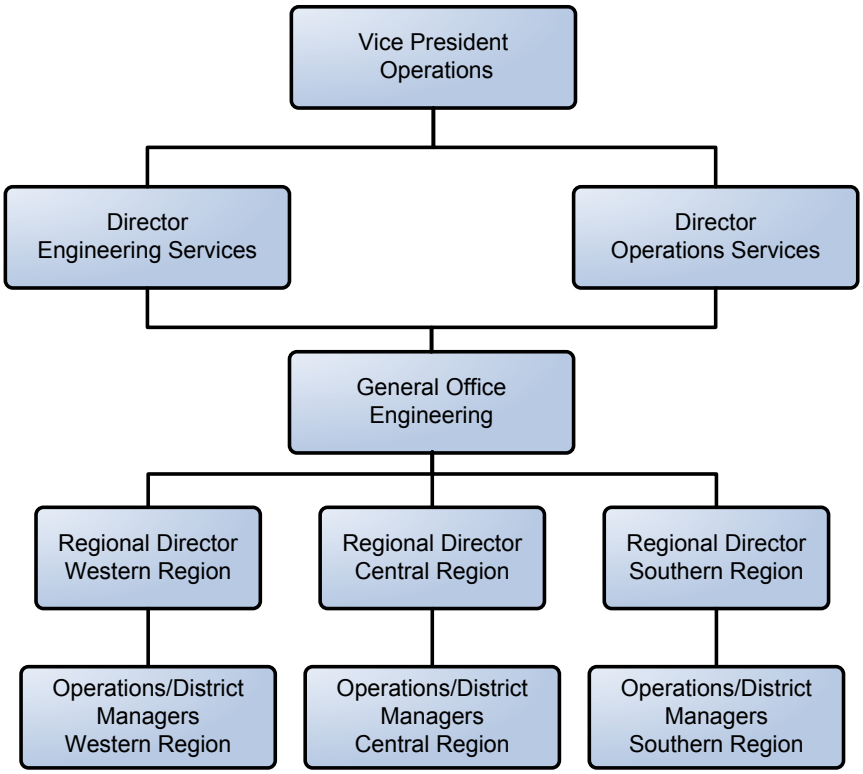


Figure 1.3: CNGC Distribution Integrity Management Organization Structure

1.8.2 MDU/GPNG

MDU/GPNG responsibilities as they relate to the Program are listed below. The Distribution Integrity Management Organization Structures for MDU/ GPNG is shown in Figure 1.4.

1.8.2.1 Vice President of Operations and Region Directors

- Monitor the implementation and continuance of the Plan within the company
- Ensure adequate budget and personnel are committed to effectively pursue the purpose of the Plan
- Perform oversight of the Plan
- Approve the Plan
- Approve changes to the Plan

1.8.2.2 Gas Distribution Engineering (General Office Engineering)

- Perform day-to-day implementation and management of the Plan
- Oversee and coordinate the implementation of the elements of the Plan
- Ensure all Documentation and Communications specified in the Plan are completed and submitted
- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed
- Review and make updates to the Plan as necessary or required

1.8.2.3 Regional Gas Superintendents

- Provide adequate personnel, tools, equipment and supervision necessary to conduct the Field activities described in the Plan.
- Ensure all Field documentation, Date collection, and Communications specified in the Plan are completed and submitted.

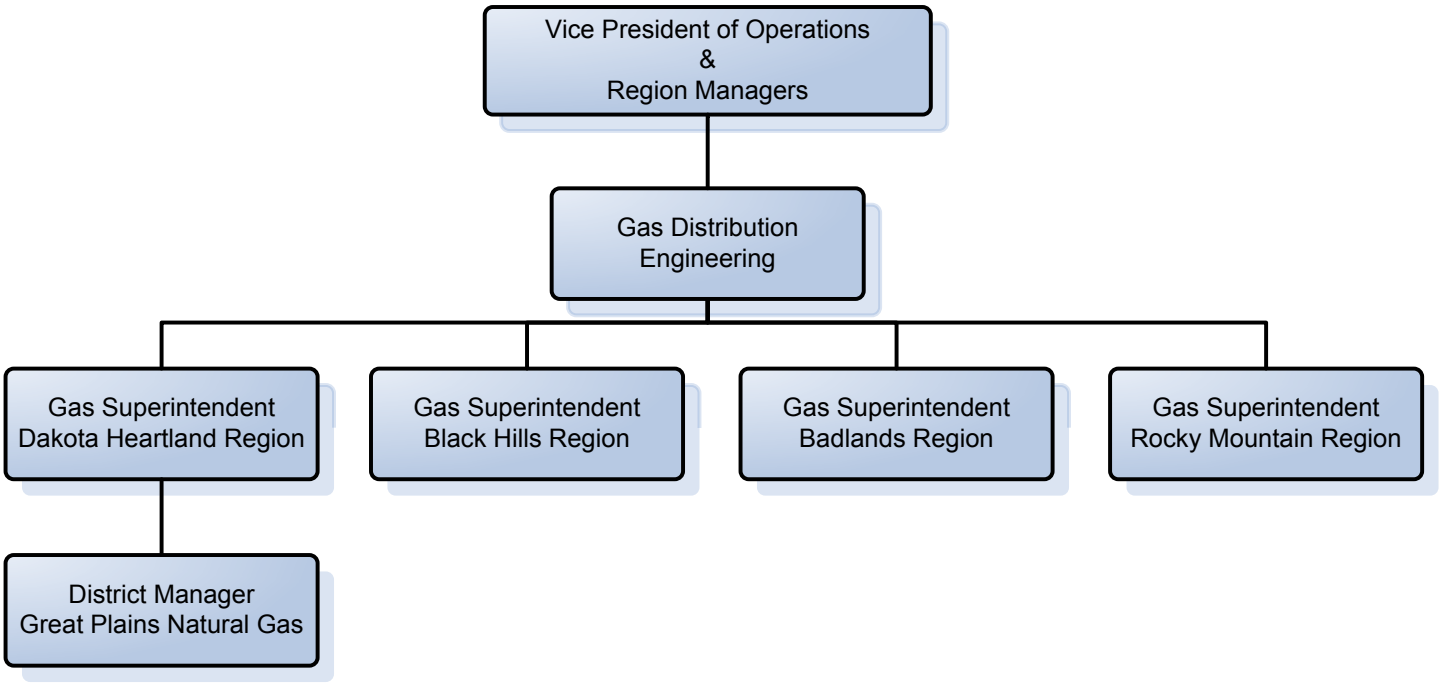


Figure 1.4: MDU Distribution Integrity Management Organization Structure

2.0 KNOWLEDGE OF DISTRIBUTION SYSTEM [§192.1007 (A)]

2.1 Overview

The purpose of this section is to demonstrate the Company's methodology for providing an understanding of its distribution system facilities.

In order to determine threats and assess risks on the distribution system, the Company begins by collecting appropriate information specific to the facilities within the distribution system. The information is found in two general categories: the physical make up of system components and the operating and maintenance history of those components.

The Company demonstrates knowledge of the system by considering the information outlined in Section 2.2 to the extent it currently exists in at least one of the Company record systems (e.g., maps, paper forms, cards, electronic data bases or files, photographs) or in the knowledge and experience of operations and maintenance personnel.

Appendix B – *Knowledge of System* will summarize the data and records collected by the Company in order to demonstrate the requirements of this section. Information included in the Appendix B may include:

- Record (Form #)
- Record Type (paper/electronic/database/GIS)
- Brief Summary of Data Collected
- Location of Record
- Is the Information used in risk model (Y/N)

2.2 Physical Infrastructure

Below is a list of distribution system characteristics that should be considered, at a minimum, when demonstrating system knowledge and identifying threats to the Company's distribution system.

2.2.1 Pipe Material

2.2.1.1 Plastic

- Plastic Polyethylene (PE)
- Poly Vinyl Chloride (PVC)
- Aldyl-A
- Others [either old or new]

2.2.1.2 Steel

- Grade
- Seam Type

2.2.2 Pipe Specifications

- Nominal Diameter

2.2.3 Construction

- Year Installed

- Location
- Casing size
- Highway/road crossing

2.2.4 Corrosion

- Below ground coating type

2.2.5 Valves

- Location
- Material or construction
- Year manufactured/installed

2.2.6 Environmental

- Water crossings
- Landslides
- Soil Characteristics
- Flood Zones
- Seismic zones

2.3 Historical Information

Below is a list of historical maintenance records that should be considered, at a minimum, when determining relevant knowledge to the integrity of the Company's distribution system.

2.3.1 Documentation of Leaks and Other Maintenance

- Repairs (categorized by cause)
- Leaks (categorized by cause)
- Exposed Pipe Inspection Reports
- Pipeline Patrol Records
- Corrosion Control Records
- Valve Maintenance Records

2.3.2 Excavation Activity

- Number of underground locate requests received

2.3.3 Operating Pressure

- Normal Operating Pressure

2.4 Outside Source Data

The Company may use data from outside sources to gain knowledge about facilities and identify threats. Such information may include flood zones, population data, wild fire zones, etc. When data

from an outside source is used, the following information must be collected and retained in Appendix B – *Knowledge of System*.

- Description of Data
- Geographic Coverage
- Data Source/Agency
- Source Format/File Type
- Source URL (if applicable)

2.5 Newly Installed Facilities

When new facilities are installed, facility information must include, at a minimum, the location and material of which it is constructed. A summary of current information collected on newly installed facilities will be listed in Appendix B – *Knowledge of System* and should include the following:

- Record
- Data Collected
- Format (Paper, Field Automation Database, GIS, etc.)

2.6 Information Evaluation

All data used in the risk model is reviewed for completeness and data accuracy through QA/QC efforts by GIS staff. The Company will continuously update and validate facility information during routine operational activities such as maintenance, construction and repairs.

2.6.1 Insufficient Data

General Office Engineering will review and evaluate the aggregated data to identify areas where data is insufficient or missing. When incomplete records and/or knowledge is identified, it will be summarized in Appendix B – *Knowledge of System* by including the following information:

- Record
- Date Identified
- Extent of Record
- Plan to Acquire Data
- Anticipated Completion Date
- Department Responsible

2.6.2 Developing Additional Information

When analysis and threat assessment indicate that additional infrastructure information may be useful or necessary, the Company will determine what additional information should be collected. Such determination may be triggered by (1) the desire to perform a more focused threat and risk analysis, (2) an indication that a different grouping would provide better understanding of risk, (3) indications that more information is required to evaluate future potential threats or (4) other currently unforeseen reasons.

Except in unusual cases, the additional information will be gathered through normal activities. In order to accomplish this, one or more of the following steps may be implemented:

- Forms or other methods used to collect information related to the physical attributes and/or operating and maintenance activities of distribution pipeline facilities are appropriately modified
- Personnel are trained to properly collect and record the expanded information and use the modified forms or data collection format
- Recordkeeping procedures and/or data management systems are updated to accept new data points
- Newly collected information is integrated into all other records
- Interviews with SMEs

2.7 Subject Matter Expert Involvement

In addition to distribution knowledge gained from company records, knowledge will be acquired from operating staff that are familiar with construction and maintenance practices, operating systems and history, and prior and present industry trends. SMEs will also be consulted to fill in operational record gaps. When SMEs are consulted for input, documentation will follow Section 1.6: Subject Matter Expert Involvement.

3.0 THREAT IDENTIFICATION [§192.1007 (B)]

3.1 Overview

This section's objective is to describe how the Company identifies relevant threats which could affect the integrity of the Company's distribution facilities. After gathering and evaluating the information outlined in Section 2, the Company will determine which threats, if any, could affect the current or future integrity of a particular facility segment. Primary threats for each facility segment will be categorized into the following:

- Corrosion
- Natural Forces
- Excavation Damage
- Other Outside Force Damage
- Material, Weld or Joint Failure
- Equipment Failure
- Incorrect Operation
- Missing Data
- Other – Forces unique to a particular area on the system

If data used for threat identification and categorization are insufficient or suspect, each threat covered by the missing or insufficient data is assumed to apply to the segment being evaluated until the process described in Section 2.6.1 is implemented and begins to produce adequate information. Unavailability of information is not justification for exclusion of a threat. Where data is missing or insufficient, conservative assumptions may be used in the risk assessment based on SME conversations and engineering decisions. Such assumptions will be documented in the Appendix D – *Risk Input*.

3.2 THREATS

This section provides threat definitions consistent with PHSMA F7100 Leak Classification definitions.

3.2.1 Corrosion

Corrosion results on pipe or other components due to galvanic, bacterial, chemical, stray current or other corrosion action. All metallic pipe and components are subject to the threat of external corrosion. The threat of internal corrosion will be identified only where the expectation of liquid water being present due to a documented event in the facility segment exists or when an internal pipe inspection has shown corrosion to be present on the inside surface of the facility. The Company does not transport corrosive gas in its distribution system therefore internal corrosion is unlikely. Atmospheric corrosion is a subset of external corrosion that will occur only on pipe and components that are not buried. For exposed pipe in areas where only a light surface oxide forms that does not affect the safe operation of the facility (§192.479), the threat of atmospheric corrosion will not be identified.

3.2.2 Natural Forces

The threat of natural forces result from earth movements, earthquakes, landslides, subsidence, lightning, heavy rains/floods, washouts, flotation, mudslide, scouring, temperature, frost heave, frozen components, high winds or similar natural causes. While Company facilities experience a wide range of atmospheric temperatures, the range is within the design limits of the materials of construction.

3.2.3 Excavation Damage

Excavation damage is damage to pipeline facilities caused by earth moving or other equipment, tools, or vehicles, including damage done by operator's personnel, contractor, or people not associated with the operator. All buried facilities in the Company's distribution system face the threat of being damaged by excavation activities. Consideration is given to piping within protective casings, inside underground structures such as basins or vaults which may be shielded or protected from excavation damage. Excavation damage can also be due to previous unknown damage on pipelines that were not repaired and result in corrosion.

3.2.4 Other Outside Force Damage

Other outside force damages are a result from fire or explosion, deliberate or willful acts, such as vandalism and vehicular damage. Only aboveground facilities are considered when determining if this threat is present. The primary concern is areas where gas piping is close enough to vehicular traffic such as automobiles, trucks, forklifts, snow plows, construction equipment, etc., where it may be reasonably expected that damage from vehicle movement could occur. Facilities in locations known to be subject to vandalism, destruction, wreckage, sabotage, or other harm (e.g., unauthorized adjustment or valve movement) may carry the other outside force damage threat.

3.2.5 Material, Weld or Joint Failure

This threat is identified by the Company when it is known or anticipated that potential defects in pipe, fittings, components and joints that were introduced during the manufacturing process may be present. Longitudinal pipe seams made by low frequency ERW before 1970, electric flash welding, lap welding, hammer welding, or butt welding and fittings or components fabricated by welding may pose a weld-related material threat. Defects within fittings and components from the manufacturing process are material threats. Certain plastic piping materials (e.g., Century Utility Products pipe, Low-ductile inner wall Aldyl A pipe manufactured before 1973, PE3306 pipe, PVC pipe and fittings, CAB pipe material) are subject to this threat. This threat also includes the failure of original sound material from force applied during construction that causes a dent, gouge, excessive stress or other defect. This includes faulty wrinkle bends, faulty field welds and damage sustained in transportation to the construction or fabrication site.

3.2.6 Equipment Failure

Equipment failure resulting from the malfunction of control/relief equipment including valves, regulators, or other instrumentation; stripped threads or broken pipe couplings on nipples, valves or mechanical couplings; or seal failures on gaskets, O-rings, seal/pump packing or similar failures. The Company will consider items of equipment exhibiting possible systemic problems as vulnerable to the equipment malfunction threat. Such items may include regulator or relief valves (e.g., failing to perform the intended task or operating outside of the manufacturer's specified tolerances), repeated history of failed

flange gaskets, repeated history of failed O-rings, repeated history of broken pipe or stripped threads, and equipment with a history of problems.

3.2.7 Incorrect Operation

The threat of incorrect operation may be applicable to either operating (e.g., start up or shut down of a pipeline, purging) or maintenance activities (e.g., ignition of escaping gas). This threat is associated with internal or external personnel. It does not include the designed operation of a device. Poor workmanship or outdated methods during the construction or installation process that constitutes a failure to follow current procedures or inadequate procedures or safety practices are considered within this threat category. Knowledge of instances where personnel have not followed approved procedures (e.g., modification of a mechanical coupling contrary to the manufacturer's recommendation, failure to install a stiffener) could lead to identification of an incorrect operation threat.

3.2.8 Other

The Company will determine if other threats are present around its distribution system that are not covered in the threats described above. Such threats will likely be attributable to special circumstances in specific locations on the system. Accelerated material deterioration not resulting from a material defect or corrosion could come under this threat category.

3.2.9 Missing Data

The Company considers missing data a threat to the distribution system. Missing data considered in this category applies to data necessary to identify threats on the system through use of the Company risk model (e.g. installation date, material type, leak cause).

3.3 Subdividing Threats

To further refine risk in threat categories, existing and potential threats may be subdivided within the primary threat categories. Decisions for subdividing threats will be based on data analysis, regional trends, industry trends, potential threat identification, Gas Piping Technology Committee (GPTC) Guidance, and SME input. Subdivided threat categories will be included with the risk model calculations documentation in Appendix D – *Risk Input* which should include the following information:

- Threat
- Subdivision Category
- Reason for Subdividing Threat
- Risk Breakdown of Subdivision

3.4 Potential Threats

This section describes how potential threats are identified, documented and added to the risk model. Potential threats are threats where the operator has not experienced a leak though conditions conducive to the threat exist. Potential threats are threats identified as having the possibility of affecting the integrity of the distribution system but have not yet been added to the risk model. Potential threats shall be company specific and a table of potential threats will be listed in Appendix C - *Threat Identification*. Prior to annual risk model runs GO Engineering will review the list of potential threats to determine if these threats are applicable to the risk model. Potential threats will be considered from external and internal sources.

3.4.1 External Sources

To stay informed of potential new threats to distribution systems, industry and regulatory recommendations will be routinely monitored from external sources including but not limited to:

- Industry and Trade Publications
- Nation Transportation Safety Board (NTSB) Reports and Recommendations
- Pipeline and Hazardous Materials Safety Administration (PHMSA) Recommendations
- State Pipeline Safety Recommendations
- Membership in American Gas Association (AGA), Northwest Operating Group (NWOG), Western Energy Institute (WEI), Gas Technology Institute (GTI), Gas Piping Technology Committee (GPTC), National Association of Corrosion Engineers (NACE)

3.4.2 Internal Sources

Concerns identified by SMEs within the operating company will also be reviewed to determine if it could be a potential threat. Isolated SME concerns brought to GO Engineering's attention following Section 1.6: Subject Matter Expert Involvement shall be summarized in Appendix G – *Subject Matter Expert,* summarizing:

- Concern
- District
- SME Name and Title
- Date Concerned Addressed to Engineering

Tracking isolated concerns in specific districts and towns will allow GO Engineering to see trending and be proactive towards emerging threats that may be affecting the entire distribution system.

3.4.3 Potential Threat Assessment

As GO Engineering identifies new potential threats they will determine if these threats are applicable to the Company distribution systems. The applicability of threats to an operator's distribution system may be identified by reviewing applicable operations and maintenance records, considering knowledge of operational personnel and evaluating relevant information.

If a threat is determined to affect the current or future integrity of the distribution system the threat will be added to the risk model and further documented in Appendix D – *Risk Input*. If additional data collection is required to effectively assign risk, Section 2.6.2 will be used to gather the information and until the data is robust enough to accurately reflect risk in the risk model, incomplete data shall be summarized as described in Section 2.6.1.

It is reasonable that some threats might not apply to the Company's system. When threats are considered but excluded from the Company's distribution system risk assessment, reasonable justification will be documented in Appendix C – *Threat Identification*.

4.0 RISK EVALUATION AND RANKING [§192.1007 (C)]

4.1 Overview

This section describes how the Company evaluates and ranks risks associated with the Company's distribution system. The Company approaches risk assessment through determining the relative risk of facilities grouped by mains and services of similar attributes and/or experiencing similar problems. The magnitude of the relative risk determination will lead to ranking of groups for the application of risk management measures. Relative risk is Company specific and only indicates a comparative value relative to other Company facilities.

All risk model weighting factors, including consequence and likelihood factors, as well as past and future considerations can be found in Appendix D – *Risk Input*.

4.2 Risk Model

The Company uses a GIS based risk model known as ESRI® Arc GIS ModelBuilder to calculate relative risk scores for facilities. The risk model is broken down into a series of sub-models that represents each threat category. Each sub-model is designed to use applicable facility data collected in Section 2 to calculate risk for facilities grouped by mains and services. Specific risk model information for each threat is outlined in Appendix D – *Risk Input*.

4.2.1 Responsibilities

GO Engineering is responsible for identifying and updating all factors and inputs that are used in the risk model and communicating any changes to the Company GIS department. Changes to the models as wells as generating the results will be completed by the GIS department when directed by GO Engineering. The Company GIS Department will execute risk model calculations when directed by General Office Engineering. The Risk Model will be run annually not to exceed 15 months from the date of the last run. Each model run will be stored and archived by the GIS Department.

4.2.2 Determination of Risk Weighting Factors

GO Engineering determines appropriate likelihood (category scores) and consequence factors (impact score) through the use of employees who are knowledgeable in the operation, maintenance, design and construction of its distribution system (i.e. SME Panel). All SME Panel decisions concerning risk weighting factors shall be documented following the process outlined in Section 1.6.2. Operational history and maintenance records will also be used when determining risk factors. Outside consultants and trade associations or other operators with expertise in gas distribution industry trends or historical methods are used when it is determined to be necessary.

Adjustment of weighting factors is allowable, appropriate and expected. One reason may be a validation of risk calculation results with actual field experience as described in Section 4.2.5. Weighting factors may also be adjusted for each operational area as opposed to applying global numbers to all Company facilities when deemed necessary by GO Engineering. Improvement of the distribution system and the Plan over time is expected and will likely require modification to some of the weighting factors. All revisions to the model weight factors will be documented in Appendix I – Periodic Evaluation using the following information:

- Date
- What was changed
- Reason for change

4.2.3 Likelihood Factors

Likelihood factors represent the possibly of a specific threat occurring on the distribution system. Numerical weightings of likelihood factors are determined as a result of facility attributes represented by the group. A zero to ten scale on one tenth intervals is used with the following levels of severity:

- 7 – 10 = High Likelihood of Failure
- 3 – 6.9 = Medium Likelihood of Failure
- 0 – 2.9 = Low Likelihood of Failure

4.2.4 Consequence Factors

Company assigns numerical weighting factors to represent consequences that may be anticipated in case of an integrity issue involving the facility groups.

Consequence factors are based on the location of the facility in relation to population density as well as the amount of gas that could potentially be released. Additional consideration may be given to "Critical Infrastructures" as defined in the Homeland Security Act (P.L. 107-56) depending on the availability and accuracy of the data. The consequence factors are generally assigned into three categories:

1) Population density and location
2) Potential Energy of Pipeline based on the operating pressure and pipe size
3) Critical infrastructure size and location

A higher number represents a greater relative consequence that could result from a failure. The numbers from the three categories are then added to create an overall consequence factor.

4.2.5 Factors for Missing Data

In the case that facility attributes are missing or unknown as identified through the process outlined in Section 2.6 within a group feature, factors will be determined for "unknown" data where it is used by the risk model. The generally accepted risk approach to "unknown" data is that because of the uncertainty it should add risk to the overall risk calculation. The Company may choose to assign higher numerical weights or likelihood factors to data fields directly used in the risk model calculations. The Company will identify and evaluate these gaps in the data and use the processes indicated in Section 2.6.2 to determine and gather the missing data over time.

4.2.6 Relative Risk Calculation

Risk is the product of the likelihood of an event occurring multiplied by the consequence of the event. In equation form:

Risk = ***Likelihood*** (category score) **x** ***Consequence*** (impact score)

The risk model sums the assigned likelihood scores for each threat to calculate a total likelihood factor within a 50 foot grid (raster). The same summing calculation is also done for each of the assigned consequence factors within the same 50 foot grid. The total Likelihood is then multiplied by the total consequence factor to establish a total relative risk score for the grid.

In order to obtain better processing and risk analysis, the final rasters are overlaid on facility poly lines and the risk is assigned at the line segment level within the GIS database. This is repeated for each segment to determine the relative facility segment risk ranking within each group in the Company distribution system.

After the relative risk is calculated for all threats for all groups, comparison of the relative risk numbers leads to those groups of the system where risk management practices should be implemented in order to improve the overall safety of the distribution system based on performance metric trending.

4.3 Risk Ranking

Using the risk results from the model run, GO Engineering will rank each threat by state. A summary of the current risk ranking will be included in Appendix E - *Risk Analysis* and should include the following information:

- Primary Threat Total Risk Scores
- Primary Threat Total Risk Scores by State
- Primary Threat Total Risk Scores by District

4.4 Risk Model Validation

The purpose of model validation is to confirm that the risk output from the model accurately reflects what is known about the Company's system in order to identify and prioritize known risks. Risk model validation will be led by GO Engineering with SME Panel consultation following Section 1.6.2. A model validation summary will be summarized in Appendix E – *Risk Analysis* and will include:

- Model Run Date
- Date of Model Validation
- Summary of Validation Results

Prior to the SME Panel meeting, GO Engineering will compile applicable model results, performance metrics and operational data trending, including leak reports, to assist and facilitate SME Panel with model validation.

If model changes and results are of no consequence from year to year GO Engineering may decide that model validation by the SME Panel is unnecessary. If model validation is decided to be unnecessary, GO Engineering shall document that no model validation is required in the Model

Validation Summary in Appendix E – *Risk Analysis* with statistics showing inconsequential data from last model validation along with signature from the Company's Director – Engineering Services.

If the SME Panel does not agree with the results of the model, the SME Panel may assist with making model calculation, threat subdivision and weighting factor adjustments to refine/calibrate the model. All model refinements shall be documented in the Appendix I – *Periodic Evaluation*, similar to Section 4.2.2. Once adjustments are complete the model will be rerun and the Model Validation process will be reiterated until model results are validated by the SME Panel.

5.0 SELECT AND IMPLEMENT RISK MANAGEMENT ACTIONS [§192.1007 (D)]

5.1 Overview

This section describes the existing and proposed measures to address the threats and associated risk to the Company's distribution system as outlined in Sections 3.0: Threat Identification and 4.0: Risk Evaluation and Ranking.

Risk management is accomplished by taking actions to reduce the likelihood of an occurrence, by alleviating the consequences of an occurrence or both. Appropriate actions are dependent on the group being addressed, the associated threat, whether the threat is current or potential in the future and the viability of the actions in managing the relevant risk factors.

5.2 Existing Programs Addressing Risk Management

This section summarizes existing plans and programs implemented by the Company that are currently in place to manage risks. Each established program contributes to the management and mitigation of risk to the distribution system. Details for each program are contained in Company Operations and Maintenance procedures and are available upon request.

5.2.1 Damage Prevention

The prevention of damage to natural gas distribution facilities by excavation is one of the most effective ways of increasing the integrity of the gas system and improving public safety relative to natural gas. The Company has implemented and maintains a Damage Prevention program that meets the following criteria:

- Meets or exceeds the requirements of §192.614 – Damage Prevention Program
- Participates in one-call programs within service territory
- Supports the Common Ground Alliance (CGA) efforts to reduce excavation damage through the publication and dissemination of best practices

5.2.2 Leak Management

The Company recognizes that managing leaks from its distribution system is an important part of addressing the integrity of the system and reducing risk by reducing the potential consequences of a leak. The Company has and effective leak management program that includes the following elements.

5.2.2.1 Locate

Leaks are located through routine and specially scheduled leakage surveys with leak detection equipment. Additionally, all leak and gas odor complaints are responded to and investigated to locate leaks that occur which are not present at the time of a leakage survey.

Leakage surveys are performed with flame ionization and/or optical methane detector equipment in locations outside of buildings. Intrinsically safe gas detection instruments may be used indoors as a screening tool for detection of the actual leak location.

5.2.2.2 Evaluate

The Company evaluates each leak detected in accordance with company leak survey procedures. Leaks are located, confirmed and classified when a sustained reading is obtained on a combustible gas indicator.

Based on the classification of the leak, additional actions may be required per company leak survey procedures. For the purpose of reporting under Section 9.1 of this Plan, the company uses the following criteria to define a hazardous leak:

- Leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous (§192.1001)

5.2.2.3 Act

Take appropriate action to mitigate these hazardous leaks. Confirmed leaks are repaired or monitored as specified in company leak survey procedures. All leaks classified as hazardous leaks are repaired or eliminated before company personnel leave the scene. Leaks considered non-hazardous may be immediately repaired, scheduled for repair or monitored depending on perceived potential of becoming more severe.

5.2.2.4 Keep records

Every confirmed leak is given a unique identifier and is tracked until it is repaired and subsequently cleared. Leak locations are tied to an address and are initially "assigned" to a main, service pipe or other unit such as a district regulating station or meter number. Leak records, including repair action and clearing confirmations, are retained at the local operating area. All leak records are retained for the life of the affected facility**.**

5.2.2.5 Self-assess

The Company determines if additional actions are necessary to keep people and property safe. Appropriate District Operations personnel routinely review leak survey, classification and repair results to ensure that all leaks discovered receive proper response. The Company reviews and trends the overall results of the leak management program per Section 6 of the Plan. When appropriate implementation of additional risk control practices or modifications to the leak management program are evaluated.

5.2.3 Maintenance Programs

Annual maintenance ensures critical system components are adequately maintained and operational as designed. Annual maintenance is performed on all regulator stations, compressor stations, and critical valves to ensure no adverse operating conditions are present. Regulator stations are checked to ensure set points are correct to achieve regulator lockup and relief set pressures are confirmed that the relief will open at desired set pressures to protect MAOP. Valves are checked annually to ensure the valve is able to open/close and lubricated/greased if needed and/or applicable.

5.2.4 Public Awareness

The awareness of the public of pipelines in their vicinity and the public's understanding of how pipelines are operated contributes to the continued safe operation of those pipelines. The knowledge that pipelines may exist in close proximity and the hazards that may result from uninformed activities nearby reduces the likelihood factor of risk. The familiarity with being able to recognize a leak and knowing how to report such an event lessens the consequences of a potential emergency condition.

The Company's Public Awareness Program contains provisions consistent with Table 2-2 in the API Recommended Practice 1162, Public Awareness Programs for Pipeline Operators. The overall Public Awareness Program meets or exceeds all requirements of §192.616 and API RP 1162.

5.2.5 Operator Qualification Program

The Operator Qualification (OQ) Program developed and administered by the Company ensures that personnel performing covered tasks on distribution pipeline facilities have the necessary knowledge, skills and abilities to safely perform those tasks with a minimum possibility of human error.

The evaluation and qualification of personnel reduces both the likelihood and consequences of a pipeline incident caused by human error. The Operator Qualification Program meets or exceeds the requirements of Part 192, Subpart N for such programs. The intervention of knowledgeable and skilled personnel in an impending or actual pipeline failure can reduce the consequence segment of the risk equation.

5.2.6 Drug and Alcohol Misuse Prevention Plan

The Company recognizes that the use of controlled substances and the misuse of alcohol may be contributing factors to human error. The reduction of an individual's normal capabilities while under the influence of drugs or alcohol can cause inferior performance of covered functions that affect both the likelihood and consequences factors in the risk equation. The Company's drug and alcohol control plans are in full compliance with Part 199 and Part 40 requirements.

5.3 Additional or Accelerated Actions

Additional or Accelerated (A/A) actions are implemented when existing compliance activities and procedures need to be supplemented to address risk identified to the integrity of the Company's distribution system. A/A actions that may be implemented to mitigate risk are included, but not limited to those listed in Table 5.1.

Table 5.1: Additional or Accelerated Actions

Threats		Possible A/A Actions
Primary	**Subcategory**	
Corrosion	External Corrosion	• Increase frequency of leak surveys • Pipeline replacement • Provide additional cathodic protection devices (e.g. anodes, rectifiers, etc.) • Correct cathodic protection deficiencies
	Internal Corrosion	• Increase frequency of leak surveys • Pipeline replacement • Install liquid collection components (e.g. drips, strainers, etc.) • Install pipe liners • Evaluate gas quality at supply inputs, take corrective action with supplier
	Atmospheric Corrosion	• Increase frequency of atmospheric corrosion surveys • Pipeline/component replacement • Apply/refurbish coating • Relocate
Natural Forces	• Outside Force • Weather • Flooding • Extreme Temperatures • Land Movement	• Relocate pipe from high risk location • Replace pipe in high risk location • Install slip or expansion joints to allow for movement • Install and monitor strain gauges on pipe • Install automatic shut-off component (e.g. excess flow valve) • Conduct leak survey after earth movement events (e.g. earthquake, flood, etc.
Excavation Damage	• Third-party damage • Operator Damage	• Conduct enhanced awareness education • Request regulatory intervention (e.g. implement fines for occurrences) • Inspect targeted excavation and backfill activities • Inspect for facility support • Improve accuracy of locating • Participate in pre-construction meetings with project engineers and contractors in high-risk areas • Use warning tape • Expand the use of excess flow valves • Improve system map accuracy and availability • Recruit support of public safety officials (e.g. fire department) • Install additional pipeline markers

Threats		Possible A/A Actions
Primary	**Subcategory**	
Other Outside Force Damage	Fire/Explosion	• Provide first responder training • Install curb valves • Improve response capability • Expand the use of excess flow valves
	Vehicular	• Expand policy on when and how to install protection • Increase frequency of patrols/inspections of high-risk facilities • Evaluate the need to relocate hard-to-protect facilities • Expand the use of excess flow valves
	Leakage (previous damage)	• Inspect exposed pipe prior to backfill • Increase frequency of leak surveys
	Vandalism	• Install or improve fences/enclosures • Increased surveillance • Relocate hard-to-protect or critical facilities
	Blasting	• Perform leak survey after blasting • Relocate away from frequent blast areas (e.g. mines) • Re-establish MAOP after blasting (e.g. pressure test)
Material Weld or Weld Failure	• Manufacturing Defects • Construction/Workmanship defects • Mechanical Damage: ➢ Pipe Material Pipe Component	• Increase frequency of leak surveys • Replace or repair • Revise construction procedures • Revise material standards • Track/trend material failures
Equipment Malfunction	• Malfunction of System Equipment • Obsolete equipment	• Replace or repair • Increase frequency of inspection/monitoring • Investigate if equipment being used is appropriate for the situation/location • Improve installation procedures • Track/trend equipment failure
In-Appropriate Operation	• Inadequate procedures • Inadequate safety practices • Failure to follow procedures	• Improve procedures • Improve training • Evaluate other locations where inadequate practices may have been used • Perform internal audits or inspections
Other	Odorant issues Missing or unknown data	• Increase frequency of leakage survey • Increase odorant levels • Increase frequency of odorant testing • Improve locations for odorant testing • Perform pipe or facility exposure to collect missing or unknown data

5.3.1.1 Additional or Accelerated Action Implementation

When A/A actions are implemented to address identified integrity threats, they shall be documented using Form 21760 – *Additional or Accelerated Action Implementation*. Documentation will at a minimum contain the following information:

- Description of A/A action being implemented
- Threat(s) that the A/A action addresses
- Description of the location where the A/A action is being implemented
- Date that the A/A action is to be implemented
- Date the A/A action is completed (if applicable)

Completed Additional or Accelerated Action forms will be stored in Appendix F – *Accelerated Actions*.

5.3.2 Additional or Accelerated Action Documentation

A summary of all active/implemented A/A actions shall be stored in Appendix F – *Accelerated Actions* and will include the following information:

- A/A Title
- Implementation Date
- Threat A/A Addresses
- Performance Metric
- Operating Region/District
- Assigned By

6.0 MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS [§192.1007 (E)]

6.1 Overview

The Company uses performance measures to provide a means to measure, communicate and improve the Program over time. The measures will provide a basis for implementing improvement efforts, including the actions described in Section 5, to support the Program goal of maintaining the integrity of the Company's distribution system.

All Performance metric statistics will be documented in Appendix H - *Performance Measures*. Performance metrics will be compiled by GO Engineering on annual model runs by March 31. Performance metrics will be compiled using Excel spreadsheet templates and all data trending techniques will be documented in the appendix.

6.2 Required Performance Measures

The required measures below are collected annually for each state and Company.

- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired, categorized by cause (cause categories will match those of the annual distribution report)
- Number of excavation damages
- Number of excavation notification tickets received from Company service territory one call centers by state (see Table 9.1)
- Total number of leaks either eliminated or repaired, categorized by cause
- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired by material

The baseline statistics used for the above metrics will be the trend over the previous five (5) years from the effective date of this Plan.

6.3 Additional Performance Measures

Performance measures the Company will collect in addition to those described in Section 6.2 are listed in table 6.1.

Table 6.1: Additional Performance Measures

Metric Description		Reporting Frequency	Metric Baseline
Company Total Relative Risk of Mains by state		Annual	January 2012
Company Total Relative Risk of Services by state		Annual	January 2012
Risk by Threat Category	• Corrosion • Equipment Failure • Excavation Damage • Incorrect Operation • Material Failure • Natural Forces • Outside Forces • Weld or Joint Failure • Other	Annual	January 2012

Risk added due to missing or unknown data	Annual	January 2012
Company Excavation Damages per 1000 locates by State	Annual	2006-2011

Additional performance measures are not limited to those listed in Table 6.1. The Company may choose to collect, track and trend other measures based on the results of activities required by this Plan. When information is collected to track and trend the results of implemented A/A actions, it should be collected on a schedule commensurate with the performance activity being measured.

6.4 Information Gathering

GO Engineering will use the GIS as the primary means for gathering information pertinent to the performance measures listed in Sections 6.2 and 6.3. If the information is not available in the GIS, paper documents and/or other electronic sources may be used to collect the necessary information. Once the information is gathered, it shall be kept in a central electronic location (e.g. Excel, Access, etc,) where the statistical data can be trended over time. The gathered information shall be available upon request from GO Engineering.

6.5 Monitoring Results to Evaluate Effectiveness

Results of the performance measures are analyzed to determine if the goals of the Program and A/A actions are being achieved. The Company has established the baseline for comparison as the beginning of the effective date of this Plan. Subsequent data will be collected annually prior to March 31.

Trends are monitored over time by GO Engineering to ensure they are moving in the appropriate direction based on the measure being evaluated.

6.5.1 Performance Metric Effectiveness Review and Trending Criteria

Performance metrics trending will be reviewed by GO Engineering to determine if implementation of an A/A action is necessary to mitigate increasing risk. This review will be summarized in the Performance Metric Trending Summary in Appendix H – *Performance Measures* and a table will consist of:

- Performance Metric
- Past Metric Values For Trending
- Data Obtained in Trending Process
- Is A/A action review necessary for performance metric? (Y/N)

A performance metric will require A/A action implementation when company specific trending criteria are triggered. Trending criteria are found in Appendix H – *Performance Measures*. When A/A action implementation is required based on performance metric trending, GO Engineering will perform an investigation and assign an A/A action to mitigate increasing integrity risks to the Company's distribution systems.

In addition to trending criteria that can trigger implementation of an A/A action, GO Engineering can also initiate an A/A action regardless of trending in an attempt to be proactive at addressing risk in operating system.

Performance metric trending will be completed by GO Engineering in conjunction with compiling the metrics and will be completed annually prior to March 31.

6.5.2 Additional or Accelerated Action Effectiveness Review and Criteria

Performance measures for implemented A/A actions will be trended and evaluated for effectiveness. GO Engineering will be responsible to trend data annually in collaboration with Performance metric compilation by March 31. This trending will be documented in Appendix F - *Accelerated Actions* in the Implemented A/A Action Trending Table and will contain:

- A/A Action Title
- A/A Action Performance Metric
- A/A Action Performance Metric Trending Values
- A/A Action Current Year Performance Metric
- Data Obtained in Trending Process
- Is A/A Action being effective at reducing risk (Y/N)

For an implemented A/A action to be considered effective at reducing risk the A/A action performance metric analyzed for a given year must meet company specific criteria which can be found in Appendix F – *Accelerated Action*. If an implemented A/A action is deemed ineffective at reducing risk in a specific year, increased efforts must be made and documented in Appendix F – *Accelerated Action* to reduce risk. Analysis of A/A performance metrics will be summarized in Appendix F – *Accelerated Action* with the following information:

- A/A Action Title
- A/A Action Performance Metric
- Company Specific Trending Data
- Can A/A action be discontinued?

Even though an A/A action can be discontinued due to meeting trending requirements, GO Engineering may decide to keep an A/A action active. Performance metric trending can be A/A action specific and will only need to be collected while the action is still ongoing.

7.0 PERIODIC EVALUATION AND IMPROVEMENT OF THE PROGRAM [§192.1007 (F)]

7.1 Review of Written Plan

GO Engineering will review the written Plan in its entirety and make updates or revisions as needed in its content a minimum of every five years from the date of previous review. The review will normally occur in the first quarter of the review year; there will be a creation date and a review date.

Starting the calendar year following effective date of this Plan (2012), appropriate GO Engineering personnel from each operating company under this Plan will meet every four (4) years to complete a review of the Program and written Plan. The review will be documented using Form 21761 – *DIMP Review Summary* and shall be retained in Appendix I - *Periodic Evaluation*.

7.1.1 Review of Appendices

Appendices in this plan contain information specific to the Company and shall be reviewed by GO Engineering annually, prior to March 31.

7.2 Revisions to the Written Plan

If changes or modifications to the Plan document are made, with the exception of appendices, a record of that change or modification will be noted on the revision control sheet and documented on Form 21761 - *DIMP Review Summary*. The revision number will only change if a revision takes place.

Changes made to the Plan will be relayed to the appropriate field personnel for dissemination to their staff for implementation. If required, the local State regulating authority will be notified and/or furnished with an updated version of the Plan document.

7.2.1 Revisions to Appendices

Revisions made to appendices do not require a new written plan revision. When changes or modifications are necessary, the revision information shall be contained within the appendix being updated or modified.

7.3 Program Improvement

Improvement of the Plan is made based primarily on the results of the risk management technique or practice. During the review, data that supports the performance of these actions should be collected and analyzed. Analysis may range from simple side-by-side comparisons to sophisticated statistical data processing. The frequency of this review is not pre-set but will be within five years of the prior results evaluation or revision. The frequency depends on an appropriate time frame for which meaningful results can be recorded. For example damage prevention methods may show results within a season where corrosion control enhancements may not provide measurable improvement for many years.

These reviews will also be used to determine if additional information about the distribution system is needed or would help identify areas for improvement. When such needs are identified, the Company will design and institute enhanced information collection activities as described in Section 2.6.2.

Program improvements may include modification of facility groups, adjustment of likelihood or consequence factors, selection of different A/A actions, or determination of additional or alternative performance measures. Overall effectiveness of integrity management in reducing risks is the governing principle.

8.0 MECHANICAL COUPLING FAILURE REPORTING [§192.1009]

8.1 Overview

The Company reports failures resulting in hazardous leaks (as defined in Section 5.2.2.2) of mechanical couplings that are in service in its distribution system at the time of the failure. Detailed information is listed in Appendix J – *Mechanical Coupling Failures*.

8.2 Reporting

All failures of any in-service mechanical coupling are reported to GO Engineering. When it can be done through normal repair or replacement procedures, the failed mechanical coupling is collected and retained for examination. At the time of the coupling failure, as much of the information listed in Section 8.2.1 is recorded and sent along with the specimen. Required information not collected during the time of failure shall be obtained by GO Engineering through further investigation.

8.2.1 Minimum Required Reportable Information

The following information is required at a minimum for mechanical fitting failures:

- Location of the failure in the system
- Nominal pipe size
- Material type (of coupling body)
- Nature of failure including contribution of local pipeline environment [soil type, contaminants]
- Coupling manufacturer
- Model number
- Lot number
- Decade of manufacture
- Other information that can be found in markings on the failed coupling

8.2.2 Additional Failure Information

Additional information collected for a mechanical fitting failure may include but is not limited to the following:

- Location of failure on the specimen (e.g., body, gasket, threads or bolts)
- Date of installation
- MAOP
- Operating pressure at time of failure
- Normal annual operating pressure range

8.3 Failure Analysis

The information listed in Sections 8.2.1 and 8.2.2 is reviewed by GO Engineering and collected by calendar year for inclusion in the Mechanical Fitting Failure annual report to PHMSA. At the end of reporting period, GO Engineering analyzes the data for the year, determines the number of similar failures for each failure reported and includes that information on the annual report. A "similar failure" is identified when one or more of the Minimum Required Reportable Information items as required in Section 8.2.1 is the same and applies only to the current calendar year data. A copy of the annual report is sent to the pipeline safety office of the State in which the failure occurred.

Except for isolated cases, the Company uses the results of the analysis as a factor in its periodic updates of threat and risk analysis. When higher or shifted relative risk is determined, the appropriate sections of the Plan are implemented.

9.0 PERIODIC REPORTS TO GOVERNMENT AGENCIES [§192.1007 (E)]

9.1 Federal AGENCY(S)

The Company reports the following information to the Pipeline and PHMSA annually by March 15th of each year. These data represent occurrences within the previous calendar year and are part of the annual report submitted by the Company to PHMSA. Statistics are recorded separately by state and Company to facilitate reporting under Section 9.2 of this Plan. For operating Companies that have facilities in multiple states, one annual report will be submitted to PHMSA covering all Company facilities. Appendix K- *Reports to Government Agencies* may be used to store completed annual reports.

- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired, categorized by cause
- Number of excavation damages
- Number of excavation notification tickets received from all operation state's one call centers listed in Table 9.1

Table 9.1: Company One Call Centers

State	Locate Ticket Center	Contact Information
Idaho	Dig Line, Inc.	Office: (208) 342-1585
Minnesota	Korpartner, Inc.	Office: (952) 368-1911
Montana	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
Oregon	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
North Dakota	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
South Dakota	Korpartner, Inc.	Office: (952) 368-1911
Washington	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
Wyoming	Password, Inc.	Office: (509) 624-5235

- Total number of leaks either eliminated or repaired, categorized by cause. This total number does not include leaks that are being monitored pending future action.
- Mechanical fitting failure data

9.2 Submitting Reports

Reports will be submitted by one of the following methods:

- Via the internet to the PHMSA on-line reporting system which is accessible through the PHMSA home page at:

  http://phmsa.dot.gov

  or

- By facsimile to:

  202-493-2311

  or

- Through US mail to:

  Pipeline and Hazardous Materials Safety Administration
  Information Resource Manager
  US Department of Transportation-East Building
  1200 New Jersey Avenue, SE
  Washington, DC 20590

9.3 State Agency(s)

Annual counts of reportable items listed in Section 9.1 for the appropriate state are sent annually by March 15th of each year to the states of South Dakota, Minnesota, North Dakota, Wyoming, Washington, Idaho, Oregon and Montana regulatory agency.

Table 9.2: State Agency Contact Information

State	State Agency Website Address	Contact Information
Idaho	http://www.puc.state.id.us/	1-208-334-0300
Minnesota	http://www.puc.state.mt.us/puc	1-800-422-0798
Montana	http://psc.mt.gov	1-406-444-6199
Oregon	http://www.oregon.gov/PUC/	1-503-373-7394
North Dakota	http://www.psc.nd.gov	1-701-328-2400
South Dakota	http://www.puc.sd.gov	1-605-773-3201
Washington	http://www.utc.wa.gov	1-360-664-1234
Wyoming	http://psc.state.wy.us	1-307-777-7427

10.0 RECORDKEEPING [§192.1011]

10.1 Overview

The Company maintains records sufficient to display compliance with CFR 49, Part 192 Subpart P. Such records are retained for a minimum of ten (10) calendar years from the year in which they are produced. GO Engineering is responsible for the retention and availability of the following records:

- Written Plan
    - Current version of the Plan
    - Past revisions of the Plan
    - Description of significant changes between versions
    - Reason each significant change was made
- Likelihood and consequence factors
    - Any supporting documentation used to determine the factors (e.g. construction and maintenance records, SME input, industry data, etc.)
- Outside source data and related information in Appendix B
- Risk management activities implemented as a result of the Program
- Performance measure results and analysis
- Appropriate documentation produced if deviations from required periodic inspections are requested
- Other applicable reports to PHMSA or local State regulatory agency

11.0 DEVIATIONS FROM PART 192-MANDATED PERIODIC INSPECTIONS [§192.1013)]

11.1 Overview

The Company reviews the risk evaluation results and the effects of implemented risk management practices for positive influences toward the reduction of risk on its distribution system. Improvements may encourage the Company to decide that a reduction in the frequency of one or more inspections or tests required by Part 192, when accompanied by appropriate actions under this Plan, will provide an equal or greater overall level of safety of its distribution system.

In such a case, an analysis is made that includes a description of safety improvement afforded by applicable risk management measure(s), the reason(s) why a particular inspection or test is selected for a reduced frequency of performance, how the available resources are used to mitigate risk in other areas and a demonstration through risk evaluation as described in Section 6.0 of the Plan that risk values are not compromised.

11.2 Documentation

A proposal similar in format to a waiver request will be submitted to the pipeline safety authority of the state in which the proposal is requested. Appropriate follow-up data are provided when requested.

The Company reviews any conditions or limitations that are associated with acceptance of the proposal. If they are acceptable, the Company begins implementation of the revised frequency schedules through the following:

- Company Management of Change Process
- Revision of appropriate O & M procedures
- Notification and training of affected personnel and/or contractors
- If necessary under its OQ plan, revising evaluations for Operator Qualification for those tasks
- Performing re-evaluations when required
- Monitoring distribution integrity management performance measures

APPENDIX A
FORMS

Appendix A – Forms

1.0 OVERVIEW OF FORMS APPENDIX

This appendix is used to keep blank copies of the forms that are used in the DIMP Plan.

1.1 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
5.3.1.1 A/A Action Implementation	Form 21760	N/A
7.1 Review of Written Plan	Form 21761	N/A
7.2 Revisions to the Written Plan	Form 21761	N/A

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table A2.1: Appendix A Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised BY
3/15/2013	Creation	New appendix created to store forms used by the DIMP plan.	Renie Sorensen & Kathleen Chirgwin

FORM 21760: ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

Operating Company:_____ **Completed By:**_____

Operating Region/District:_____ **Completed Date:**_____

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: _____

Threat(s) A/A Addresses:_____

Reason for A/A Action:_____

Description of locations that A/A will be implemented: _____

A/A Implementation Date:_____

List A/A Performance Metric to determine A/A Effectiveness and when A/A can be discontinued:

_____

Does A/A Action require added A/A performance metrics? ☐ YES ☐ NO

If yes, describe new metric(s) and collection schedule:

Supporting Documentation:_____

Additional Comments:_____

FORM 21761: DIMP REVIEW SUMMARY

Date Started:_____
Review Completion Date:_____
Review Completed By:_____

Reason/s for Program review: _____

Changes to the Written Plan required? ☐YES ☐NO **If Yes, complete the Change Summary Table and approval is required**

Changes to Risk Model required? ☐YES ☐NO **If Yes, include a summary of recommended changes and approval is required**

Summary of recommended changes: _____

Written Plan: Change Summary

Plan Section	Reason For Change	From	To

New Plan Revision Number Required? ☐YES ☐NO **If Yes, Revision number to be updated:**_____

VP –Operations (CNGC): _____ **Date:** ____/____/____

VP –Operations (IGC): _____ **Date:** ____/____/____

VP – Operations (MDU/GPNG):_____ **Date:** ____/____/____

Changes Implemented By:_____ **Date Implemented:**_____

FORM 21762: SUBJECT MATTER EXPERT INTERVIEW/INPUT

Person(s) Conducting the Interview:_____ **Interview Date:**_____

Purpose of SME Interview: _____

SME Information:

SME Name:_____ SME Job Title:_____

Operating Company:_____ Years of Experience:_____

Operating Region:_____

Other relevant information:_____

Audit Results and Conclusions:

Summary of interview results: _____

Are Changes Required to the Program? ☐YES ☐NO **If yes, changes to:** ☐Risk Model ☐Plan ☐ GIS ☐ Other (Describe)

Describe Changes: _____

Interviewer: _____ **Date:** ____/____/____

SME: _____ **Date:** ____/____/____

FORM 21764: SME PANEL DECISIONS

Person(s) Conducting the Panel Meeting:_____ **Panel Date:**_____

Purpose of SME Panel Meeting:

☐ RISK MODEL CALCULATION CHANGES ☐ MODEL VALIDATION ☐ RISK MITIGATION ☐ RISK MODEL PERFORMANCE ☐ OTHER (EXPLAIN)

Meeting was conducted using:

☐ IN PERSON ☐ WEB/CONFERENCE CALL ☐ IN PERSON & WEB/CONFERENCE CALL ☐ OTHER (EXPLAIN)

Summary of Panel Decisions:

Are Changes Required to the Program? ☐ YES ☐ NO

If yes, changes to: ☐ Risk Model ☐ Plan ☐ GIS ☐ Performance Metrics ☐ Other (Describe)

Describe Changes (include implementation plan/schedule):

SME Panel Members (if more than 7, include another page)

1) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

2) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

3) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

4) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

5) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

6) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

7) SME Name:_____ SME Job Title:_____
   Operating Company:_____ Years of Experience:_____
   Operating Region:_____
   Other relevant information:_____

Signatures (if more than 7 SME's, include another page):

Interviewer: _____ **Date:** ____/____/____

1) **SME:**_____ **Date:** ____/____/____

2) **SME:**_____ **Date:** ____/____/____

3) **SME:**_____ **Date:** ____/____/____

4) **SME:**_____ **Date:** ____/____/____

5) **SME:**_____ **Date:** ____/____/____

6) **SME:**_____ **Date:** ____/____/____

7) **SME:**_____ **Date:** ____/____/____

APPENDIX B
KNOWLEDGE OF DISTRIBUTION SYSTEM

Appendix B - Knowledge of Distribution System

Table of Contents

1.0 SUMMARY OF DISTRIBUTION SYSTEM KNOWLEDGE

1.1 Overview

The purpose of this appendix is to provide a summary of CNG's knowledge of the distribution system. The following sections are created from past and present construction as-builds, daily operations, and maintenance documents to demonstrate CNG's knowledge of the distribution system. In addition a summary of the company's missing or incomplete data is present to show where continuous improvement is possible.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as follows:

Plan Section	Appendix Section	Table number
2.1 Overview	3.0 Operational Data	B3.1
2.4 Outside Source Data	4.0 Outside Source Data	B4.1
2.5 Newly Installed Facilities	5.0 Newly Installed Facilities	B5.1
2.6.1 Insufficient Data	6.0 Insufficient/Missing Data	B6.1

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table B2.1: Appendix B Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	New appendix created to summaries the company's knowledge of the distribution system.	Renie Sorensen & Kathleen Chirgwin
3/17/2015	Update	Updated outside source table	Renie Sorensen

3.0 OPERATIONAL DATA

3.1 Overview

This section gives a summary of the operational information that is collected during normal pipeline operation including: continuing surveillance records, maintenance

records, and new construction records. All listed records have been considered for use within the DIMP model by GO engineering. For the records that not currently being used in the risk model, GO engineering has reviewed and determined that the currently do not provide useful data toward the risk model, but will be reconsidered for future enhancements to the model.

Table B3.1: Operational Data

Record (form)	Record Type (Paper/ electronic/ database/ GIS)	Summary	Record Location	Used in Risk Model
Geographic Information System (GIS)	Electronic/GIS	All company information used in the risk model is stored in GIS.	Company Server	Yes
As-Built/ Construction Drawing Records	Paper/ Electronic	Plans and design drawings showing: material, date of installation, location, pipe size, construction method, MAOP, pressure test information,	Paper-GO Archives/ electronic-electronic archives	Yes
Leak Investigation/ Leak Record (CNG 293A, B, C)	Electronic	This form provides information on the leak location, leak cause and if the leak is repaired or monitored.	Electronic Archives, SharePoint	Yes
Exposed Pipe Report (CNG 625)	Paper/ Electronic	Provides a snapshot of the coating and pipe condition. Also provides source to collect missing or unknown data.	Paper- GO Archives/ Electronic-SharePoint	No
Material and Component Failure Report (21713)	Electronic	Provides information on location and root cause of the failure. Includes Mechanical Fitting Failures	SharePoint	No
Continuing System Surveillance and system Patrol(CNG 286, 297)	Paper/ Electronic	Surveillance occurs during: Periodic maintenance, quarterly patrols and inspections, cathodic protection checks and leak surveys. Records: construction activity, exposed pipe condition, pipeline markers, presence of erosion, condition of ROW, new high occupancy structures, and identifies any AOCs present on the pipeline.	Paper- GO Archives/ Electronic-SharePoint	No

Record (form)	Record Type (Paper/ electronic/ database/ GIS)	Summary	Record Location	Used in Risk Model
Leak Survey	Paper/ Electronic	Records areas that have been surveyed and the presence of any leaks	Paper- GO Archives/ Electronic- SharePoint	No
Pressure Log (CNG 347)	Paper/ Database	Records High and low pressures at select points in the distribution system	Paper- GO Archives/ Database- SharePoint	No
Regulator/ Valve Maintenance (CNG 287A, B)	Paper/ Electronic	Records the condition of the Regulator and valve stations and ensures they are at their proper operating settings.	Paper- GO Archives/ Electronic- SharePoint	No
Distribution Line Reports (CNG 336)	Electronic	Records the location, date of installation, materials used, pipe size, construction method, MAOP, and pressure test of distribution mains installed.	Electronic Archives	Yes
Facility Installation Diagram (CNG 315)	Electronic	Records the location, date of installation, materials used, pipe size, construction method, MAOP, and pressure test of services installed.	Electronic Archives	Yes
PHMSA Annual Report	Electronic	Records and tracks excavation damage, locate tickets, and leaks repaired by cause.	PHEMSA.dot.gov	No
Sub-Damage Report (CNG 293, Subdam Report)	Paper/ Electronic	Records the location and cause of excavation damage sustained by the distribution system, and tracks the number of locate tickets for a given area	Paper- GO Archives/ Electronic- SharePoint	Yes
One Call Tickets	Electronic	Records the location of excavation tickets for use in the model	SharePoint	Yes
Pipeline Lowering	Paper	Documentation on all pipeline lowering projects	G.O Engineering Archive	No
Pressure Increase Plans	Paper	Documentation on all pressure increase plans.	G.O Engineering Archive	No
Uprating Plans	Paper/Electronic	Documentation on all pressure uprating plans.	G.O Engineering	No

Record (form)	Record Type (Paper/ electronic/ database/ GIS)	Summary	Record Location	Used in Risk Model
			Archive	
Cathodic Protection Annual Survey	Electronic	Documents CP readings at selected points around the system to verify adequate CP protection on distribution system	SharePoint	No
MAOP Review	Electronic	Record of System MAOPs. Pressure recording devices or electronic pressure monitoring used to monitor system pressure at specific points in the system based on HI/LOW set points given to Gas Control from Engineering.	SharePoint	Yes
MAOP Validation Records	Electronic	All high pressure line records have been reviewed and summarized in a spreadsheet. Grade, wall thickness, pressure test, etc. is included.	Sharepoint	No

4.0 OUTSIDE SOURCE DATA

4.1 Overview

Outside source data provides additional data that is applicable to identifying risk within the distribution system.

Table B4.1: Outside Source

Data	Geographic Coverage	Source Agency	Source Type	Source Format	Source/URL
Line Locates	Oregon/Washington	One Call	PCAD	Excel Spread Sheet	Oregon/Washington Utility Notification Center
Flood Zones	By County/Oregon	University of Oregon	Digital Q3 Flood Data	DLG, ARC/INFO, MapInfo	http://libweb.uoregon.edu/map/gis_data/fema.html
Flood Zones	By County/Washington	Washington Dept. of Ecology	DFIRMS, Digital Q3 Flood Data	zip file/shape file	http://www.ecy.wa.gov/services/gis/data/flood/flood.htm
Oceans/Lakes/Rivers/Creeks	Oregon/Washington	BLM	Hydrography Publication Dataset	zip file/gdb	http://www.blm.gov/or/gis/data.php
Wild Fires	Nationwide	USDA Forest Service	MODIS Fire Detection Data	zip file/shape file	http://activefiremaps.fs.fed.us/gisdata.php

Landslides	Nationwide	ESRI	USA Landslide Susceptibility	ESRI data Layer	http://www.arcgis.com/home/item.html?id=cc5e9da58860460188705c545e86c871
Railroad Network	Nationwide	ESRI	Federal Railroad Administration	ESRI data layer	ESRI Data & Maps DVD
Street Data	Nationwide	TomTom North America, Inc., ESRI	Street Map North America	shape file, MapInfo	ESRI Data & Maps
Census Block Population Data	Nationwide	ESRI	U.S. Census Block Group Data Set	ESRI data layer	ESRI Data & Maps DVD
Schools	Nationwide	Institute of Education Sciences	National Center for Education Statistics	Excel Spread Sheet	ELSI - Elementary and Secondary Information System
Hospitals	Nationwide	ESRI	Annual Survey Database	ESRI data layer	ESRI Data & Maps DVD (2009)
Soil Data	Nationwide	National Resources Conservation Service (NRCS)	Soil Survey Geographic Database (SSURGO)	ESRI shape file, Access database	http://soildatamart.nrcs.usda.gov
Precipitation Data	Nationwide	National Resources Conservation Service (NRCS)	NRCS PRISM Dataset	ASCII raster grid	http://www.prism.oregonstate.edu/
Shorelines	Nationwide	NOAA's Ocean Service, Office of Coast Survey (OCS)	U.S. Vector Shoreline Data	ESRI shape file	http://www.nauticalcharts.noaa.gov/csdl/ctp/cm_vs.htm
Marine Shorelines	Washington	Washington State Department of Ecology	Washington State Marine Shorelines	ESRI shape file	http://www.ecy.wa.gov/services/gis/data/shore/shore.htm

5.0 NEWLY INSTALLED FACILITYES

5.1 Overview

This section provides a summary of the information collected during the installation of new pipeline facilities.

Table B5.1: New Facilities Data

Record	Summary of data Collected	Format
As-Built/ Construction Drawing Records	Plans and design drawings showing: material, grades, date of installation, location, pipe size, construction method, MAOP, design pressure, pressure test information, joining method	Paper/Electronic/GIS
Distribution Line Reports (CNG 336)	Records the location, date of installation, materials used, pipe size, construction method, MAOP, and pressure test of distribution mains installed.	Paper/Electronic/GIS
Facility Installation Diagram (CNG 315)	Records the location, date of installation, materials used, pipe size, construction method, MAOP, and pressure test of services installed	Paper/Electronic/GIS

6.0 INSUFFICIENT/MISSING DATA

6.1 Overview

This section summarizes the additional information in regards to the knowledge of the distribution system that can be used to assess applicable threats and risk to the system. As well as describing current plans to collect/find this information.

Table B6.1: Insufficient/Missing Data

Record	Date Identified	Extent of Record	Plan to Acquire Data	Anticipated Completion Date	Responsible Department
625 Pipeline Integrity Reports	1/1/2013	All paper records (2011-2013 Scanned on SharePoint)	Paper records will be digitized and mapped spatially in GIS	12/31/2016	Engineering/ Enterprise GIS

Record	Date Identified	Extent of Record	Plan to Acquire Data	Anticipated Completion Date	Responsible Department
Repair Records	1/1/2013	CNCG does not have good records on repairs made to non-leaking events. (ex wrapping pipe during normal maintenance activities)	CNGC will be improving the 293 and 625 forms specifically to address maintenance repair documentation.	12/31/2014	G.O Engineering, Operations, and Compliance
Sewer Cross Bores	1/1/2013	CNGC has no data available on sewer cross bore incidents.	Collect sewer cross bore data and start identifying risk.	12/31/2017	G.O. Engineering, Operations.
Asbuilt Records	1/1/2013	CNGC has some problematic towns where not all the information in main and services is mapped in GIS.	GIS Staff is mapping paper asbuilt that were not mapped in original GIS conversion. GIS staff is working on tracking down asbuilt not in GIS and mapping data. Primary focus is mains and the secondary focus will be services.	12/31/2015	GIS Department
Shorted Casings	2/12/2013	Paper records in Cathodic Protection folder on SharePoint	Compile list of known shorted casings and map locations in GIS to assign corrosion risk	12/31/2014	GO Engineering, GIS Department, Corrosion Manager
Vault Locations	2/12/2013	Regulator and valve vaults are not currently mapped in	This information can be mapped using annual maintenance forms to identify the facilities that are	12/31/2014	GIS Department

Record	Date Identified	Extent of Record	Plan to Acquire Data	Anticipated Completion Date	Responsible Department
		GIS. The information is contained within maintenance forms.	located in vaults.		
Pressure Test Records on High Pressure Mains.	3/26/2015	Input pressure test on High Pressure mains records to GIS	High Pressure Lines that we do not have a pressure test on would be assigned risk in the model.	12/31/2016	GIS Department

APPENDIX C
THREAT IDENTIFICATION

Appendix C - Threat Identification

Table of Contents

1.0 SUMMARY OF THREAT IDENTIFICATION

1.1 Overview

The purpose of this appendix is to record potential threats that have been identified within CNG's system. It also provides a location to document information that was excluded from the risk model with a justification for their exclusion.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
3.4 Potential Threats	4.0 Potential Threats	C4.1
3.4.3 Potential Threat Assessment	5.0 Records/Threats not Included in Risk Model	C5.1

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table C2.1: Appendix C Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	New appendix created to summaries threats to the distribution system.	Renie Sorensen & Kathleen Chirgwin

3.0 THREAT AND SUB-THREAT

3.1 Overview

Primary and sub-threats are not provided in this appendix. Primary threats were identified in the plan body in section 3.2. Sub-Threat divisions are shown in Appendix D Table D2.1 and include a brief explanation. Weighting of these sub-threats, within the model, is also identified in Table D2.1 of Appendix D.

4.0 POTENTIAL THREATS

4.1 Overview

The potential threat section provides a location for the monitor and recording of external sources that identify potential threats that could affect the distribution system.

Table C4.1: Potential Threat

Potential Threat	Source	Date of Review	Applicable to CNGC	Currently in Risk Model
Driscopipe 8000 pipe	PHMSA Docket # PHMSA-2012-0044	3/9/2012	Yes	No
Failure of Mechanical Fittings	PHSMA Docket # 2012-0079	12/31/2012	Yes	No
Polykan Wrap	SME Panel weighting Review	2/12/2013	Yes	No
Flooding Vaults-ability to access	SME Panel weighting Review	2/12/2013	Yes	No
Powder Coated meter bar Corrosion(Received between xx-xx)	SME Panel weighting Review. More information needed on Date range	2/12/2013	Yes	No
Future utility/road improvement projects	WUTC	2/14/2013	Yes	No
Customer Built structures over existing pipelines	WUTC	2/14/2013	Yes	No
Access to pipeline in water Areas	Filed Knowledge (Steve Kessie)	2/14/2013	Yes	No
Trenchless Technologies (Sewer Cross Bores)	WUTC/ Industry	2/14/2013	Yes	No
Facilities in Tsunami Zones	State Tsunami Designation Zones (Steve Kessie)	2/14/2013	Yes	No

5.0 RECORDS/THREATS NOT INCLUDED IN RISK MODEL

5.1 Overview

This section provides a location to identify records/threats that are unused or do not apply to the risk model and give a justification as to why the exclusion from the model was made. The exclusion from the model does not mean the information was not considered or reviewed, but that the information is unavailable at this time to include in the model.

Table C5.1: Non-Applicable Threats/Unused Records

Threat/ Records	Justification for Exclusion From Model
Aldyl-A Pipe	Not found in CNGC's distribution system
Cast Iron Pipe	Not found in CNGC's distribution system
Material Failure Reports	Material failure reports are reviewed by Director of Operation Services following Company Procedure 722, Director of Operator Services is responsible to bring material/component failure to resolution and ensure all responsible parties are notified as a result of the investigation. All material failure report investigations will be assessed for potential threats on the integrity of distribution system and assigned risk if applicable.
Continuing Surveillance Records	Per Cascade Procedures all abnormal operating conditions are reported on AOC forms to district management and are resolved at district level and do not represent long term risk to system integrity concerns for Cascade.
Regulator/Valve Maintenance Records	Records are not mapped and thus cannot be added to risk model. These forms are reviewed by District Management and Engineering and immediate action is taken to resolve operating issues.
Pipeline Lowering Records	Currently CNGC does not map Areas that have been Lowered. Engineering is responsible to prepare all Lowering plans following CNGC Procedure 622and all HP mains /services lowered are supervised by Construction Services. Lowering pipelines pose no integrity risk to Cascade distribution systems.
MAOP Uprating records and Pressure Increase Plans	Currently CNGC does not map Areas that have had a MAOP Uprate. Uprates plan are completed by Engineering following CNGC Procedure 620 and all Uprates are approved by State Pipeline Commissions. Uprates pose no integrity risk to Cascade distribution systems.
Cathodic Protection Records	Cathodic Protection records are reviewed by Corrosion Manager. All cathodic protection issues are resolved by Corrosion Manager, posing no long term risk to CNCG distribution systems.

Threat/ Records	Justification for Exclusion From Model
Pressure Log Charts	MAOP of pipeline are used in risk calculation for consequence, pressure charts are used to monitor daily pressure fluctuations to evaluate growth potential and monitor low pressure areas for necessary reinforcements, low pressure concerns have no effect on pipeline integrity.
PHMSA Annual Reports	Information from the PHMSA Annual Report is used to trend leaks by cause. This information is pulled into the risk model from other sources.
System Over Pressurizations	All over pressurizations and abnormal operating conditions are reported to engineering and engineering determines immediate corrective action. After corrective action is taken no long term risk is applicable to system integrity.

APPENDIX D
RISK MODEL INPUT

Appendix D - Risk Input

Table of Contents

1.0 SUMMARY OF RISK INPUT

1.1 Overview

The purpose of this appendix is to summarize the risk factors that CNG applies to the risk model.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
3.1 Overview	3.0 Summary of Risk Model Weighing factors	Table D3.1
3.3 Subdividing Threats	3.0 Summary of Risk Model Weighing factors	Table D3.1
3.4.3 Potential Threat Assessment	3.0 Summary of Risk Model Weighing factors	Table D3.1
4.1 Overview	3.0 Summary of Risk Model Weighing factors	Table D3.1
4.2 Risk Model	3.0 Summary of Risk Model Weighing factors	Table D3.1

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table D2.1: Appendix D Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Creation of new appendix to hold company specific information about risk input information including: Weighting factors, and VB Script text for the model.	Renie Sorensen & Kathleen Chirgwin
2/24/2014	2014 Updates	Updates to model code logic and minor changes to weighting factors.	Kathleen Chirgwin
3/17/2015	2015 Updates	Updated to model code logic.	Renie Sorensen

3.0 SUMMARY OF RISK MODEL WEIGHTING FACTORS

3.1 Overview

This section of Appendix D includes a summary of the DIMP risk model weightings for each of the threat categories and their subcategories. A summary of revisions to the risk model, including weighting factors, are included in Section 3.0 of Appendix I – *Periodic Evaluation*.

Risk Likelihood of Failure (LOF) factors are assigned based on three levels of severity

1. High LOF factor = 7 - 10
2. Medium LOF factor = 3 - 6.9
3. Low LOF factor = 0.1 - 2.9
4. No LOF = 0
5. Reduces LOF < 0

All assigned LOF factors from this document are multiplied by 10 in the model in order to avoid using decimals in ESRI Model Builder.

All facilities are 'active'. No analysis was performed on abandoned Mains or Services. All Leaks are considered to have been repaired or are monitored until repair.

The data available in our system extends back to the mid 1950s. Some information such as categorized leak causes has changed over time and is expected change into the future as new threats and causes come into view.

In an effort to shorten the 'run-time' of the DIMP model, the queries listed in each category are run against a pre-selected set of features. This eliminates the need to assign a high score to potentially missing data within each model. The model assigns elevated risk to missing data in a separate 'Missing Values' category.

All external data used in the DIMP model is listed in a Appendix B, Table B4.1

Table D3.1: Current Weight Factors

Primary Threat	Sub-threat	Factor	Weighting	Comments
Corrosion	Previous Leaks (All)	Monitored Leak	10	Leak and repair data was taken to the extent it is available in the GIS with thought that the corrosion cause has always been defined the same. Facilities that have experienced corrosion in the past influence the probability of a failure happening in the future. Leaks or repairs that have a repair date prior to the installation date of the main or service will be excluded.
		Repaired Leak	8	
		Maintenance Repair	4	
	Exposed Pipe Inspections	Poor	5	Pipe inspections are added to the GIS and indicate the condition of the coating as observed by onsite personnel. Poor and fair coating conditions pose additional risk of corrosion. Model is currently coded to leak report data on external pipe condition, internal pipe condition, and coating condition.
		Fair	2.5	
		Good	0	
	Atmospheric Corrosion	Above ground Regulator Stations, Odorizer Stations, and valve sets within 1 mile of salt water bodies (oceans, estuaries, rivers under tidal influence)	1	Salt in atmosphere is highly corrosive to above ground steel piping.
		Above Ground Facilities experiencing high annual rainfall levels (30 in/yr or greater)	1	Wet conditions on Westside of WA accelerate corrosion rates on above ground facilities. Cascade operates systems in two very different climates, the Westside experiences heavy rainfall conditions while the eastside experiences arid desert conditions with very low rainfall
		Steel Pipe on bridges	1	Bridge crossing lack pipe coating and cathodic protection posing corrosion risk.

Primary Threat	Sub-threat	Factor	Weighting	Comments
Corrosion (Continued)	Material Age (Steel Pipe Only)	PRE-CNG or FISH OR Pipe Installed prior to 1958 (over 20 years of no CP in pipe life)	3	Cathodic protection mandated federally in 1970 and all of Cascade's distribution systems were fully protected by 1978, pipe is assigned risk based on the number of decades in its operating life it lacked CP, which poses corrosion risk. Xtru pipe coat came to Cascade in 1967, so all steel pipe prior to 1979 is coal tar wrap. Risk is given to steel pipe prior to 1979 due to lack of cathodic protection and coal tar wrap which can become fragile and disbonded from pipe allowing pipe to be exposed from moisture and rocks causing corrosion. Coal tar wrapped steel also takes higher CP Voltages to adequately protect than Xtru Coat. Corrosion is time and condition independent, a pipe lacking CP can be unprotected for one year and experience the same amount of corrosion as a piece of pipe lacking CP protection for 20 years.
		Pipe Installed from 1958 to 1968 . (10- 20 years of no CP in pipe life)	1	
		Pipe Installed from 1968 to 1978 . (less than 10 years of no CP in pipe life)	0.5	
	Ability to provide Cathodic Protection in Arid Climates	Below ground steel pipe in Arid Climates (annual rainfall <= 15 in/yr)	0.2	Steel pipe in arid climates is difficult to protect with Cathodic protection due to very dry soil conditions in rocky/sandy soils.
	Bare Steel	Bare Steel	4	CNGC has two methods to protect pipe from corrosion, pipe wrap and CP protection. Since bare steel pipe lacks one of CNGCs two corrosion protection measures, bare steel is assigned additional corrosion risk. Bare steel also takes significant more CP voltage to protect than coal tar wrap or Xtru coat.

Primary Threat	Sub-threat	Factor	Weighting	Comments
Natural Forces	Previous Leak (10 years)	Monitored Leak	10	Leak and repair data was taken to the extent it is available in the GIS with thought that the Natural Forces cause has always been defined the same. Facilities that have experienced a failure due to a natural force in the past influence the probability of a failure happening in the future. Leaks or repairs that have a repair date prior to the installation date of the main or service will be excluded
		Repaired Leak	8	
		Maintenance Repair	2	
	Flooding – Regulator Stations and Valves	Base Flood (Floodway)	1	Risk is added to regulator stations based on Federal Emergency Manual Agency (FEMA) Flood hazard zone designations. These designations are used to assign risk to facilities in flood zones where flood insurance purchase is mandatory. See FEMA flood hazard zone designations shown on a Flood Insurance Rate Map (FIRM): FEMA DFIRMs
		Base Flood (Non-Floodway)	0.5	
		Base Flood (Floodway) w/ BFE Zone	1	
		Base Flood (Non-Floodway) w/ BFE Zone	0.5	
		Base Flood w/ Sheet-flow Shallow Flooding	0	
		Base Flood w/ Water-Surface Elevation (ponding 1-3 ft)	0	
	Flooding – Mains and Services	Base Flood (Floodway)	0.5	Risk is added to regulator stations based on Federal Emergency Manual Agency (FEMA) Flood hazard zone designations. These designations are used to assign risk to facilities in flood zones where flood insurance purchase is mandatory. See FEMA flood hazard zone designations shown on a Flood Insurance Rate Map (FIRM): FEMA DFIRMs
		Base Flood (Non-Floodway)	0.3	
		Base Flood (Floodway) w/ BFE Zone	0.5	
		Base Flood (Non-Floodway) w/ BFE Zone	0.3	
		Base Flood w/ Sheet-flow Shallow Flooding	0	
		Base Flood w/ Water-Surface Elevation (ponding 1-3 ft)	0	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Natural Forces (Continued)	Water Crossing	Yes	1	All segments crossing significant waterways such as lakes, rivers, streams and canals are given added risk. The National Hydrography dataset is the external data source used to identify the location of such waterways.
	Frost Upheaval – Mains and Services	Service – "High" Susceptibility to Frost Upheaval - Bare Steel, Coated Steel, Unknown Material	0.5	CNG has had several failures due to frost upheaval, the threat does exist and an element of risk is given to facilities with soil attribute data specific to having a higher susceptibility to frost upheaval. CNG uses soil attribute data supplied by the National Resources Conservation (NRCS). Services are given a slightly higher score as they are generally shallower than main.
		Service – "High" Susceptibility to Frost Upheaval - Plastic Material	0.3	
		Main – "High" Susceptibility to Frost Upheaval- Bare Steel, Coated Steel, Unknown Material	0.3	
		Main – "High" Susceptibility to Frost Upheaval- Plastic Material	0.2	
	Wild Fires	Moderate Chance	0.5	Wild fires pose a significant threat to above ground facilities. The Northwestern United States ranks high on the list for potential wildfires. Wild Fire data used for analysis in the DIMP model is based on US Forest Service regional fire maps of the past 10 years. Areas are identified by kernel density of wild fires in CNG's operating region. The resulting regions are intersected with regulator stations and risk scores are assigned based on likelihood of wild fires at those locations.
		High Chance	1	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Natural Forces (Continued)	Landslides	High Incidence (>15% Area)	2	Gas pipelines are often threatened by impact and displacement from landslides. Landslide hazard areas used for analysis in the DIMP model are obtained from the digital compilation of the USGS National Landslide Overview Map. Areas which are defined by susceptibility of landslides are intersected with mains and service lines. Risk scores are assigned based on likelihood of landslides occurring at those locations.
		Moderate Incidence (1.5-15% Area)	1	
		High Susceptibility & Moderate Incidence	1.5	
		High Susceptibility & Low Incidence	0.5	
		Moderate susceptibility & Low Incidence	0.3	
Excavation Damage	Previous Leaks (10 years)	Monitored Leak	10	Historical excavation damages are not necessarily indicative of future events. This is why historical leaks and repairs are given a lower score when compared to other leaks such as corrosion. Leaks or repairs that have a repair date prior to the installation date of the main or service will be excluded.
		Repaired Leak	8	
		Maintenance Repair	2	
	Line Locate Activity	Line Locate within 50 ft radius	2 (Per Ticket)	Currently all pipe that falls within a 50 foot radius of a Line Locate Ticket location is given an added risk. The risk score remains assigned to the pipe for a period of six months after the completion date of the ticket. In the Line Locate data is provided by One Call.
	District Damages/1000 Locate Tickets	Damages/1000 Locates >10	3	Added risk is given to facilities based on the ratio of excavation damages per 1,000 locate tickets from the previous Calendar Year. The assigned risk will be based on the Common Ground Alliance national average as of 2011. The national average from the 2011 CGA report is 5.10 damages per 1,000 locate tickets.
		Damages/1000 Locates >5.1 & <=10	2	
		Damages/1000 Locates >3 & <=5.1	1	
		Damages/1000 Locates >1.5 & <=3	0.5	
		Damages/1000 Locates <1.5	0	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Excavation Damage (Continued)	Cased Pipe	Yes	-1	Risk is reduced for pipe that is installed in a casing as the carrier pipe has a reduced risk for Excavation Damage
	Recent Install Date on Main	Installed within 1 year	2	A comparison of Excavation Damage and Install Date on Mains and Services reveals that excavation damage occurs predominantly during the first few years after installation.
		Installed within 2 year	0.5	
		Installed within 4 year	0.5	
		Installed within 6 year	0	
	Recent Install Date on Service	Installed within 1 year	2	
		Installed within 2 year	1	
		Installed within 4 year	0.3	
	Ability to Locate PE Mains/Services	PE Installed Prior to 1995	4	When Cascade first started installing PE mains and services in until 1995 they had a poor tracer wire installation procedure with poor splice kits, which have the potential of being disconnected which adds excavation risk to these early PE systems. Several district in CNGC have expressed this concern since they have experienced these conditions where PE mains and services are very difficult to locate which could lead to poor locates leading to excavation damage incidents.
Other Outside Force Damage	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date prior to the installation date of the main or service will be excluded.
		Repaired Leak	8	
		Maintenance Repair	2	
	Major Road Crossing	Main	0.5	Significant road crossings add an element of Outside Force risk to facilities due to weight and vibration. Risk is added to segments that cross roads designated as highways or interstates using Navteq center line data.
		Service	0.5	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Other Outside Force Damage (Continued)	Vehicular Damage	Riser (25 ft)	0.5	Above ground facilities have a higher susceptibility to vehicle damage. Risers, Rural Taps (High Pressure Service Sets) and Regulator Stations within 25 feet of a road right of way will get added risk.
		Regulator Stations (25 ft)	1	
		High Pressure Service Set (25 ft)	1	
	Casing	Steel Casing < 50 years Old	-2	While casings are not desired for corrosion related reasons, they due add an element of protection to the outside force threat. Because casings are not protected for corrosion, they can break down over time. For this reason, casings less than 25 years old will have a reduced risk while casings older than 50 years will be assumed to have no added outside force protection. This was based on an average corrosion rate of 3 mills per year with a casing wall thickness of 0.188".
Material Failure	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date prior to the installation date of the main or service will be excluded. Historically, CNG used the Material and Welds failure cause code in GIS to identify failures that groups Material failures with weld/joint failures. For this reason, leaks and repairs with Facility Types as Girth Weld or Longitudinal Weld are excluded.
		Repaired Leak	8	
		Maintenance Repair	2	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Weld or Joint Failure	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date prior to the installation date of the main or service will be excluded. Historically, CNG used the Material and Welds failure cause code in GIS to identify failures that groups Material failures with weld/joint failures. For this reason, leaks and repairs with Facility Types as Girth Weld or Longitudinal Weld are used for this category.
		Repaired Leak	8	
		Maintenance Repair	4	
	Weld Standards	Steel pipe installed prior to 1980	1	In 1980 Cascade significantly increased weld standards and welder qualifications.
	Non Controllable Fitting	Coupling, Elbow, End Cap, Expansion Joint, Flange, Reducer, Full Open Tee, Transition, Insulted Coupling	0.3	The non-controllable fittings increases the number of welds and thus increases the likelihood of failure
Equipment	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date that is prior to the installation date of the main or service will be excluded.
		Repaired Leak	8	
		Maintenance Repair	2	
	Age of Valve	FISH or PRE-CNGC	3	Risk is added to the Equipment failure on valves based on the age due to the increased likelihood failure. Risk is only added to steel valves or valves on unknown material, no risk is added to plastic valves.
		>= 60 years	2	
		>= 40 years & <60 years	1	
		>= 30 years & <40 years	0.5	
		>= 20 years & <30 years	0	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Equipment (Continued	High Pressure Service Set Present	Yes	2	High Pressure Service Sets (Farm Taps/ Rural Taps) are not on regular maintenance schedule like District Regulator Stations (annual) so piping with a HPSS point feature will receive added risk.
Incorrect Operation	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date that is prior to the installation date of the main or service will be excluded.
		Repaired Leak	8	
		Maintenance Repair	2	
Other	Previous Leaks (10 Years)	Monitored Leak	10	The Company will use the previous ten years of leak history in order to reflect current risk on the distribution system. Leaks and repairs are remediated when found, or monitored until remediated, and those that have a repair date prior to the installation date of the main or service will be excluded. Repairs for this category are given less risk when compared to other threat categories. The thought behind this is because repairs categorized as Other are generally used for maintenance activities such as installing anodes and lowing pipe.
		Repaired Leak	8	
		Maintenance Repair	2	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Missing Values	Leak Information	Leak Type	8	If required information on leaks and repairs used in the risk model is missing, added risk will be assigned.
		Repaired	2	
		MDU Leak Number	4	
		Repair Date	1	
	Repair Information	Leak Type	4	
	Install Information	Date Installed	4	If required information on newly installed mains and services used in the risk model is missing, added risk will be assigned.
		Material Type-'SubtypeCD'	4	
	Valve Information	Valve Material	3	If required information on newly installed valves used in the risk model is missing, added risk will be assigned.
		Installation Date	3	

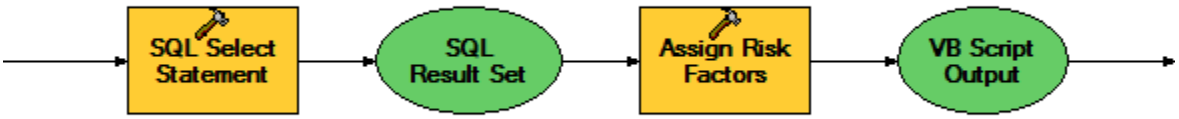
Primary Threat	Sub-threat	Factor	Weighting	Comments
Consequence	Population Density	Square Mile <100	0	The Census Block Group data is included with the ESRI Data & Maps media kit and contains estimated population per square mile value. This value is used as a measure to calculate the impact of a gas system failure on the user community adjacent to the gas system.
		Square Mile >=100 & <500	0.5	
		Square Mile >=500 & <1000	1	
		Square Mile >=1000 & <2000	2	
		Square Mile >=2000 & <5000	3	
		Square Mile >=5000 & <10000	4	
		Square Mile >=10000	5	
	Pressure and Diameter	Diameter^2 * Pressure Class <240	1	The Main and Service Pressure Class and Nominal Pipe Size represent a measure of the potential severity of a gas system failure. Rather than assigning risk factors to pressure classes and pipe sizes individually, relative risk was calculated based on potential severity of a gas release with PE = D^2 * P. Where *D* is the nominal diameter and P is the pressure class. Current pressure classifications are as follows. • Low Pressure = 1 psig • Distribution Pressure = 60 psig • Intermediate Pressure = 250 psig • High Pressure = 500 psig If no pressure class inputted then we assume 60 psig for Potential Energy calculation. If no diameter is inputted then we give score of 5 as worst case scenario.
		Diameter^2 * Pressure>=240 & <4,000	2	
		Diameter^2 * Pressure>=4,000 & <16,000	3	
		Diameter^2 * Pressure>=16,000 & <32,000	4	
		Diameter^2 * Pressure >= 32,000	5	

Primary Threat	Sub-threat	Factor	Weighting	Comments
Consequence (Continued)	Steel Tapping Ability	Steel D>=2 in	2	All CNGC districts can stop and tap 2" IP/HP steel mains, some districts can stop and tap 4" IP/HP steel mains. When incidences occur inserting linestoppers are necessary to stop the flow of blowing gas and repair incidence outside of gas envelope, risk is added to steel 2" and greater since Division must respond with correct tapping equipment which adds time to response. No risk is assigned to PE or 2" steel since all districts have the ability to make a squeeze or pinch in emergency response.
	Critical Infrastructure	Near Critical Infrastructure	1	A Critical Infrastructure is defined in the Homeland Security Act and includes public health and emergency services among others. Hospitals and schools are identified within the CNG's operating region and a buffer zone is created for each, based on average daily occupancy. The buffer is calculated on a curve, such that a minimal buffer is assigned even where occupancy numbers were not reported. Buffer ranges from 30 to 300 ft based on occupancy data.
	Service Line EFV	EVF on Service Line	-3	Excess flow valves (EFVs) respond to an excessive flow of gas such as may occur as a result of a leak by automatically closing and restricting the gas flow. This in turn reduces the consequence of a failure where EFV's are installed. The company complies with Current federal regulation requirements and a reduced consequence is given to segments where EFV's are installed.

4.0 MODEL CALCULATIONS

4.1 Overview

This section includes the Visual Basic (VB) scripts specific to each threat. The script identifies the correct ESRI Model Builder language used to assign the risk factors listed in Section 1 of this appendix. In each case the script is preceded by a relevant SQL Select Statement. The Select Statement extracts a certain set of records from the database that fulfill a specific criterion. The string of geoprocessing tools shown below is typical of the workflow used in the DIMP model to assign risk factors. A Company GIS Analyst performs all necessary updates and changes to the scripts and all historical scripts will be archived on the Engineering SharePoint page.



4.2 Corrosion

4.2.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='COR'

Dim Score
If [SUBTYPECD] > 0 then              'leak report
  If [REPAIRED] = "MON" then           'monitored leak
    Score = 10
  Else                                 'repaired leak
    Score = 8
  End If
Else                                  'maintenance repair
  Score = 4
End if
Risk = Score
```

4.2.2 Exposed Pipe Inspections

```
SELECT *
FROM LeaksAndRepairs
WHERE INTERNALCONDITION='F' OR INTERNALCONDITION='P' OR
EXTERNALCONDITION='F' OR EXTERNALCONDITION='P' OR COATCOND='F' OR
COATCOND='P'

Dim Score
If ([INTERNALCONDITION] = "P" OR [EXTERNALCONDITION] = "P" OR [COATCOND]
="P") then       'poor
   Score = 5
```

```
ElseIf ([INTERNALCONDITION] = "F" OR [EXTERNALCONDITION] = "F" OR [COATCOND] =
"F") then     'fair
   Score = 2.5
Else
   Score = 0
End If
Risk = Score
```

4.2.3 Atmospheric Corrosion

4.2.3.1 Above Ground Facilities within 1 mile of Marine Shoreline

```
SELECT *
FROM AboveGroundFacilities, MarineShoreLine
WHERE ST_Intersects(AboveGroundFacilities.Shape,
ST_Buffer(MarineShoreLine.Shape, 5280))  = 1

Risk = 1
```

4.2.3.2 Above Ground Facilities in High Annual Rainfall Areas

```
SELECT *
FROM AboveGroundFacilities, HighAnnualRainfallArea
WHERE ST_Intersects(AboveGroundFacilities.Shape, HighAnnualRainfallArea.Shape)  =
1

Risk = 1
```

4.2.3.3 Steel Pipe on Bridges

```
SELECT *
FROM Main, hyd_pub_Merg
WHERE (SUBTYPECD=1 OR SUBTYPECD=3) AND ST_Intersects(Main.Shape,
ST_Buffer(hyd_pub_Merg.Shape, 10))  = 1

Risk = 1
```

4.2.4 Bare Steel

```
SELECT *
FROM Main
WHERE SUBTYPECD = 1

Risk = 4
```

4.2.5 Material Age (Steel Pipe Only)

```
SELECT *
FROM Main
WHERE SUBTYPECD <> 5

Dim Score
If ([WORKORDERID] = "PRE-CNG" OR [WORKORDERID] = "FISH") then
  Score = 3
```

```
ElseIf [DATEINSTALLED] >= #01-01-1948# AND [DATEINSTALLED] < #01-01-1958# then
 Score = 3
ElseIf [DATEINSTALLED] >= #01-01-1958# AND [DATEINSTALLED] < #01-01-1968# then
 Score = 1
ElseIf [DATEINSTALLED] >= #01-01-1968# AND [DATEINSTALLED] < #01-01-1978# then
 Score = 0.5
Else
 Score = 0
End If
Risk = Score
```

4.2.6 Lack of Cathodic Protection in Arid Climate

```
SELECT *
FROM Main
WHERE SUBTYPECD <> 5 AND ST_Intersects(Main.Shape, LowAnnualRainfallArea.Shape)  = 1

Risk = 0.2
```

4.3 Equipment Failure

4.3.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='EQ' AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE -
REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
 Else                                'repaired leak
  Score = 8
 End If
Else                                 'maintenance repair
 Score = 2
End if
Risk = Score
```

4.3.2 Age of Valve

```
SELECT *
FROM GasValve

Dim Score
Dim Age
Age = DateDiff ( "yyyy", [INSTALLATIONDATE] , Date)
If ([WORKORDERID] = "PRE-CNG" OR [WORKORDERID] = "FISH") then
 Score = 3
ElseIf Age >= 60 then
 Score = 2
```

```
ElseIf ( Age >= 40 AND Age < 60) then
 Score = 1
ElseIf ( Age >= 30 AND Age < 40) then
 Score = 0.5
ElseIf ( Age >= 20 AND Age < 30) then
 Score = 0
ElseIf Age < 20 then
 Score = 0
Else
 Score = 0
End If
Risk = Score
```

4.3.3 Rural Tap

```
SELECT *
FROM RuralTap

Risk = 2
```

4.4 Excavation Damage

4.4.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='EQ' AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE -
REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
 Else                                'repaired leak
  Score = 8
 End If
Else                                 'maintenance repair
 Score = 2
End if
Risk = Score
```

4.4.2 Line Locate Activity

```
SELECT *
FROM Main, CNG_OneCall
WHERE ST_Intersects(Main.Shape, ST_Buffer(CNG_OneCall.Shape, 50)) = 1

Risk = 2
```

4.4.3 District Damages per 1,000 Locate Tickets

```
SELECT *
FROM Main, MainExcavationLeaks_Districts
WHERE ST_Intersects(Main.Shape, MainExcavationLeaks_Districts.Shape) = 1
```

```
Dim Score
If [EXCDAMAGES_PER1000LOC] > 10.0 then
 Score = 3
ElseIf ( [EXCDAMAGES_PER1000LOC] > 5.1 AND [EXCDAMAGES_PER1000LOC] <= 10.0 )
then
 Score = 2
ElseIf ( [EXCDAMAGES_PER1000LOC] > 3.0 AND [EXCDAMAGES_PER1000LOC] <= 5.1 )
then
 Score = 1
ElseIf ( [EXCDAMAGES_PER1000LOC] > 1.5 AND [EXCDAMAGES_PER1000LOC] <= 3.0 )
then
 Score = 0.5
Else
 Score = 0
End If
Risk = Score
```

4.4.4 Cased Pipe (includes Inserts & Sleeves)

```
SELECT *
FROM GasPipeCasing

Risk = -1
```

4.4.5 Recent Install Date

4.4.5.1 Main

```
SELECT *
FROM Main
WHERE (Current_Date - DATEINSTALLED) < 365.0 * 6.0

Dim Score
Dim Age
Age = DateDiff ("yyyy", [DATEINSTALLED] , Date)
If Age <= 1 then            '1 year since install
 Score = 2
ElseIf (Age > 1 AND Age <= 2) then    '2 years since install
 Score = 0.5
ElseIf (Age > 2 AND Age <= 4) then    'btw 3 & 4 years since install
 Score = 0.5
Else
 Score = 0
End If
Risk = Score
```

4.4.5.2 Service

```
SELECT *
FROM Service
WHERE (Current_Date - DATEINSTALLED) < 365.0 * 6.0
```

```
Dim Score
Dim Age
Age = DateDiff ("yyyy", [DATEINSTALLED] , Date)
If Age <= 1 then            '1 year since install
 Score = 2
ElseIf (Age > 1 AND Age <= 2) then    '2 years since install
 Score = 1
ElseIf (Age > 2 AND Age <= 4) then    'btw 3 & 4 years since install
 Score = 0.3
Else
 Score = 0
End If
Risk = Score
```

4.4.6 Ability to locate PE

```
SELECT *
FROM Main
WHERE SUBTYPECD = 5 AND DATEINSTALLED < date '1995-01-01'

Risk = 4
```

4.5 Incorrect Operation

4.5.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE (LEAKTYPE='OP' OR LEAKTYPE='CD') AND (CUTOFFDATE - REPAIRDATE) >= 0
AND (CUTOFFDATE - REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
 Else                                'repaired leak
  Score = 8
 End If
Else                                 'maintenance repair
 Score = 2
End if
Risk = Score
```

4.6 Material Failure

4.6.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE ((LEAKTYPE='MAT' AND (LEAKDESCRIPTION NOT LIKE '%WELD%' AND
LEAKDESCRIPTION NOT LIKE '%SEAM%')) OR  (LEAKTYPE='MAT' AND LEAKDESCRIPTION
IS NULL)) AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE - REPAIRDATE) <=
365.0 * 10.0
```

```
Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
 Else                                'repaired leak
  Score = 8
 End If
Else                                 'maintenance repair
 Score = 2
End if
Risk = Score
```

4.7 Natural Forces

4.7.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='NF' AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE -
REPAIRDATE) <= 365.0 * 10.0
```

```
Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
 Else                                'repaired leak
  Score = 8
 End If
Else                                 'maintenance repair
 Score = 2
End if
Risk = Score
```

4.7.2 Flooding – Regulator Stations and Valves

```
SELECT *
FROM RegulatorStation, WA_OR_Floodzone
WHERE ST_Intersects(RegulatorStation.Shape, WA_OR_Floodzone.Shape) = 1
```

```
Dim Score
If ( [ZONE] = "A" AND [FLOODWAY] = "FW" ) then          'base flood (floodway)
 Score = 1
ElseIf ( [ZONE] = "A" AND [FLOODWAY] <> "FW" ) then     'base flood (non-
floodway)
 Score = 0.5
ElseIf ( [ZONE] = "AE" AND [FLOODWAY] = "FW" ) then     'base flood (floodway)
w. BFE zones
 Score = 1
ElseIf ( [ZONE] = "AE" AND [FLOODWAY] <> "FW" ) then    'base flood (non-
floodway) w. BFE zones
 Score = 0.5
```

```
ElseIf [ZONE] = "AO" then              'base flood w. sheet-flow shallow flooding
 Score = 0
ElseIf [ZONE] = "AH" then             'base flood w. constant water-surface elevation
(ponding)
 Score = 0
Else
 Score = 0
End If
Risk = Score
```

4.7.3 Flooding – Mains and Services

```
SELECT *
FROM Main, WA_OR_Floodzone
WHERE ST_Intersects(Main.Shape, WA_OR_Floodzone.Shape) = 1

Dim Score
If ( [ZONE] = "A" AND [FLOODWAY] = "FW" ) then            'base flood (floodway)
 Score = 0.5
ElseIf ( [ZONE] = "A" AND [FLOODWAY] <> "FW" ) then         'base flood (non-
floodway)
 Score = 0.3
ElseIf ( [ZONE] = "AE" AND [FLOODWAY] = "FW" ) then          'base flood (floodway)
w. BFE zones
 Score = 0.5
ElseIf ( [ZONE] = "AE" AND [FLOODWAY] <> "FW" ) then         'base flood (non-
floodway) w. BFE zones
 Score = 0.3
ElseIf [ZONE] = "AO" then              'base flood w. sheet-flow shallow flooding
 Score = 0
ElseIf [ZONE] = "AH" then             'base flood w. constant water-surface elevation
(ponding)
 Score = 0
Else
 Score = 0
End If
Risk = Score
```

4.7.4 Water Crossings

```
SELECT *
FROM Main, hyd_pub_Merg
WHERE ST_Intersects(Main.Shape, hyd_pub_Merg.Shape) = 1

Risk = 1
```

4.7.5 Frost Upheaval

4.7.5.1 Steel Mains

```
SELECT *
FROM Main, soilmu_a_frost
WHERE ST_Intersects(Main.Shape, soilmu_a_frost.Shape) = 1
```

```
Dim Score
Select CASE [SUBTYPECD]
 CASE 1          'Bare Steel Main
    Score = 0.3
 CASE 3          'Coated Steel Main
    Score = 0.3
 CASE 5          'Plastic Main
    Score = 0.2
 CASE 7          'Unknown
    Score = 0.3
 CASE ELSE
    Score = 0
 End Select
Risk = Score
```

4.7.5.2 Services

```
SELECT *
FROM Service, soilmu_a_frost
WHERE ST_Intersects(Service.Shape, soilmu_a_frost.Shape) = 1

Dim Score
Select CASE [SUBTYPECD]
 CASE 1          'Bare Steel Service
    Score = 0.5
 CASE 3          'Coated Steel Service
    Score = 0.5
 CASE 5          'Plastic Service
    Score = 0.3
 CASE 7          'Unknown
    Score = 0.5
 CASE ELSE
    Score = 0
 End Select
Risk = Score
```

4.7.6 Wild Fires

```
SELECT *
FROM RegulatorStation, MODIS_WildFires
WHERE ST_Intersects(RegulatorStation.Shape, MODIS_WildFires.Shape) = 1

Dim Score
Select CASE [GRIDCODE]
 CASE 1          'moderate chance of wild fire
  Score = 0.5
 CASE 2          'high chance of wild fire
  Score = 1
End Select
Risk = Score
```

4.7.7 Landslides

```
SELECT *
FROM Main, LandSlides
WHERE ST_Intersects(Main.Shape, LandSlides.Shape) = 1

Dim Score
If [INC_SUS] = "high" then          'high landslide incidence (>15% of area involved)
 Score = 2
ElseIf [INC_SUS] = "mod" then       'moderate landslide incidence (1.5 - 15% of area
involved)
 Score = 1
ElseIf [INC_SUS] = "combo-hi" then      'high susceptibility and moderate incidence
 Score = 1.5
ElseIf [INC_SUS] = "sus-high" then      'high susceptibility and low incidence
 Score = 0.5
ElseIf [INC_SUS] = "sus-mod" then       'moderate susceptibility and low incidence
 Score = 0.3
Else
 Score = 0
End If
Risk = Score
```

4.8 Other Outside Force

4.8.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='OUT' AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE -
REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then             'leak report
 If [REPAIRED] = "MON" then             'monitored leak
  Score = 10
 Else                                   'repaired leak
  Score = 8
 End If
Else                                'maintenance repair
 Score = 2
End if
Risk = Score
```

4.8.2 Major Road Crossing

```
SELECT *
FROM Main, ESRIStreets_ORWA
WHERE ST_Intersects(Main.Shape, ST_Buffer(ESRIStreets_ORWA.Shape, 35)) = 1

Risk = 0.5
```

4.8.3 Vehicular Damage

4.8.3.1 Regulator Station

```
SELECT *
FROM RegulatorStation, RightOfWay
WHERE ST_Intersects(RegulatorStation.Shape, ST_Buffer(RightOfWay.Shape, 25)) = 1

Risk = 1
```

4.8.3.2 Farm Tap

```
SELECT *
FROM RuralTap, RightOfWay
WHERE ST_Intersects(RuralTap.Shape, ST_Buffer(RightOfWay.Shape, 25)) = 1

Risk = 1
```

4.8.3.3 Riser

```
SELECT *
FROM GasServicePoint, RightOfWay
WHERE ST_Intersects(GasServicePoint.Shape, ST_Buffer(RightOfWay.Shape, 25)) = 1

Risk = 0.5
```

4.8.4 Casings (includes Inserts and Sleeves)

```
SELECT *
FROM GasPipeCasing
WHERE (Current_Date - INSTALLATIONDATE) < 365.0 * 50.0

Dim Score
Select CASE [MATERIAL]
 CASE "ST"            'steel
  Score = -2
 CASE ELSE
  Score = 0
End Select
Risk = Score
```

4.9 Weld or Joint Failure

4.9.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE (LEAKTYPE='MAT' AND (LEAKDESCRIPTION LIKE '%WELD%' OR
LEAKDESCRIPTION LIKE '%SEAM%')) AND (CUTOFFDATE - REPAIRDATE) >= 0 AND
(CUTOFFDATE - REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then              'leak report
 If [REPAIRED] = "MON" then          'monitored leak
  Score = 10
```

```
  Else                                    'repaired leak
    Score = 8
  End If
Else                                    'maintenance repair
  Score = 4
End if
Risk = Score
```

4.9.2 Non Controllable Fitting

```
SELECT *
FROM NonControllableFitting

Risk = 0.3
```

4.9.3 Controllable Fitting (Extension Stoppers)

```
SELECT *
FROM ControllableFitting
WHERE SUBTYPECD = 1

Risk = 0.3
```

4.9.4 Weld Standards

```
SELECT *
FROM Main
WHERE SUBTYPECD <> 5

Dim Score
If [DATEINSTALLED] < #01-01-1980# then
  Score = 1
Else
  Score = 0
End If
Risk = Score
```

4.10 Other

4.10.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE LEAKTYPE='OTH' AND (CUTOFFDATE - REPAIRDATE) >= 0 AND (CUTOFFDATE -
REPAIRDATE) <= 365.0 * 10.0

Dim Score
If [SUBTYPECD] > 0 then              'leak report
  If [REPAIRED] = "MON" then            'monitored leak
    Score = 10
  Else                                  'repaired leak
    Score = 8
  End If
```

```
Else                                    'maintenance repair
 Score = 2
End if
Risk = Score
```

4.11 Missing Values

4.11.1 Leaks and Repairs

```
SELECT *
FROM LeaksAndRepairs
WHERE MDULEAKNO IS NULL OR REPAIRED IS NULL OR LEAKTYPE IS NULL OR
REPAIRDATE IS NULL

Dim Mdulk
Dim Rprdt
Dim Reprd
Dim Lktyp
If [SUBTYPECD] > 0 then                 'leak report
 If IsNull( [MDULEAKNO] ) then
  Mdulk = 4
 Else
  Mdulk = 0
 End If
 If IsNull( [REPAIRDATE] ) then
  Rprdt = 1
 Else
  Rprdt = 0
 End If
 If IsNull( [REPAIRED] ) then
  Reprd = 2
 Else
  Reprd = 0
 End If
 If IsNull( [LEAKTYPE] ) then
  Lktyp = 8
 Else
  Lktyp = 0
 End If
Else                                    'maintenance repair
 If IsNull( [LEAKTYPE] ) then
  Lktyp = 4
 Else
  Lktyp = 0
 End If
End if
Risk = Mdulk + Rprdt + Reprd + Lktyp
```

4.11.2 Mains and Services

```
SELECT *
FROM Main
```

```
WHERE SUBTYPECD = 7 OR DATEINSTALLED IS NULL OR DATEINSTALLED >
Current_Date

Dim DateIns
Dim PressCl
Dim WOID
Dim Subtyp
If IsNull( [DATEINSTALLED] ) then
   DateIns = 4
ElseIf DateDiff("d", [DATEINSTALLED], Date) < 0 then
   DateIns = 4
Else
   DateIns = 0
End If
If [SUBTYPECD] = 7 then
   Subtyp = 1
Else
   Subtyp = 0
End If
Risk = DateIns+Subtyp
```

4.11.3 Valves

```
SELECT *
FROM GasValve
WHERE MATERIAL IS NULL OR INSTALLATIONDATE IS NULL

Dim Mat
Dim InsDate
Dim WOID
If IsNull( [MATERIAL] ) then
   Mat = 3
Else
   Mat = 0
End If
If IsNull( [INSTALLATIONDATE] ) then
   InsDate = 3
Else
   InsDate = 0
End If
Risk = Mat+ InsDate
```

4.12 Consequence Factors

4.12.1 Population Density

```
SELECT *
FROM WA_OR_CensusBlk
WHERE STCOFIPS IN ( '41001', '41009', '41013', '41017', '41031', '41035', '41045',
'41049', '41059', '53001', '53005', '53007', '53011', '53015', '53017', '53021', '53025',
'53027', '53029', '53035', '53045', '53057', '53061', '53071', '53073', '53077')
```

```
Dim Score
If [POP10_SQMI] < 100 then
 Score = 0
ElseIf [POP10_SQMI] >= 100 AND [POP10_SQMI] < 500 then
 Score = 0.5
ElseIf [POP10_SQMI] >= 500 AND [POP10_SQMI] < 1000 then
 Score = 1
ElseIf [POP10_SQMI] >= 1000 AND [POP10_SQMI] < 2000 then
 Score = 2
ElseIf [POP10_SQMI] >= 2000 AND [POP10_SQMI] < 5000 then
 Score = 3
ElseIf [POP10_SQMI] >= 5000 AND [POP10_SQMI] < 10000 then
 Score = 4
ElseIf [POP10_SQMI] >= 10000 then
 Score = 5
Else
 Score = 0
End If
Risk = Score
```

4.12.2 Pressure and Diameter

4.12.2.1 Potential Energy Calculation (Main)

```
SELECT *
FROM Main
WHERE [POTENTIAL_ENERGY] = [PIPESIZE]^2 * Pressure

Static Pressure as variant
Dim PS
If [MAOP] > 0 Then
 PS = [MAOP]
Else
 PS = 0
End If
Pressure= PS
```

4.12.2.2 Potential Energy Calculation (Service)

```
SELECT *
FROM Service
WHERE [POTENTIAL_ENERGY] =[PIPESIZE]^2 * Pressure

Static Pressure as variant
Dim PS as Integer
Select CASE [PRESSURECLASS]
 CASE "LP"       'Low Pressure
 PS = 1
 CASE "DP"       'Distribution Pressure
 PS = 60
 CASE "IP"       'Intermediate Pressure
 PS = 250
```

```
 CASE "HP"        'High Pressure
 PS = 500
 CASE ELSE
 PS = 60
End Select
Pressure= PS
```

4.12.2.3 Risk Calculation

```
SELECT *
FROM Main

Dim Score
If [POTENTIAL_ENERGY] > 0 AND [POTENTIAL_ENERGY] < 240 then
 Score = 1
ElseIf [POTENTIAL_ENERGY] >= 240 AND [POTENTIAL_ENERGY] < 4000 then
 Score = 2
ElseIf [POTENTIAL_ENERGY] >= 4000 AND [POTENTIAL_ENERGY] < 16000 then
 Score = 3
ElseIf [POTENTIAL_ENERGY] >= 16000 AND [POTENTIAL_ENERGY] < 32000 then
 Score = 4
ElseIf [POTENTIAL_ENERGY] >= 32000 then
 Score = 5
Else
 Score = 5
End If
Risk = Score
```

4.12.3 Steel Tapping Ability

```
SELECT *
FROM Main
WHERE (SUBTYPECD =1 OR SUBTYPECD =3 OR SUBTYPECD =7) AND (PRESSURECLASS = 'IP' OR
PRESSURECLASS = ‘HP’)

Dim Score
If [PIPESIZE] >= 2 then
 Score = 2
Else
 Score = 0
End If
Risk = Score
```

4.12.4 Critical Infrastructure

4.12.4.1 Schools

```
SELECT *
FROM Main, Schools
WHERE ST_Intersects(Main.Shape, ST_Buffer(Schools.Shape, Log(( STUDENT_TOT +
FTE_TEACHER ) + 2) * 100)) = 1

Risk = 1
```

4.12.4.2 Hospitals

SELECT *
FROM Main, Hospitals
WHERE ST_Intersects(Main.Shape, ST_Buffer(Hospitals.Shape, Log(((TOTAL_ADM + INPATIENT + OUTPATIENT + EMERG_RM)/365 + EMPLOYEES) + 2) * 100)) = 1

Risk = 1

4.12.5 Excess Flow Valves

SELECT *
FROM ExcessFlowValve

Risk = -3

APPENDIX E
RISK ANALYSIS AND RANKING

Appendix E - Risk Analysis

Table of Contents

1.0 SUMMARY OF RISK ANALYSIS

1.1 Overview

The purpose of this appendix is to summarize the risk rankings determined from the results generated by the risk model.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
4.3 Risk Ranking	3.0 Risk Ranking	Table E3.1, E3.2
4.4 Risk Model Validation	4.0 Model Validation Summary	Table E4.1

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table E2.1: Appendix E Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Creation of new appendix to summaries risk rankings and record model validation.	Renie Sorensen & Kathleen Chirgwin
2/25/2014	Addition	Added Standard Deviation Analysis on Total Risk (Section 5) and Added Time Dependent and Time Independent Risk Evaluation (Section 6)	Kathleen Chirgwin

3.0 RISK RANKING

3.1 Overview

This ranking is taken directly from the risk model. CNG has specified the rankings for the complete system and divided the system into the different operating states and districts. These scores and rankings will be updated after each model run. All risk in table is combination of mains and services.

Table E3.1: Company Risk Score and Ranking

Threat	Total Score	Ranking
Corrosion	129,968,723	2
Natural Forces	56,267,973	5
Excavation Damage	312,613,190	1
Other Outside Force	8,888,081	6
Material	385,137	8
Weld/Joint	71,047,990	4
Equipment	1,325,511	7
Incorrect Operations	20,564	10
Other	78,969	9
Missing Value	117,824,264	3

Table E3.2: Risk Score and Ranking by State

Threat	Washington		Oregon	
	Total Score	Ranking	Total Score	Ranking
Corrosion	109,110,852	2	20,857,871	3
Natural Forces	47,712,853	5	8,555,120	5
Excavation Damage	226,911,865	1	85,701,325	1
Other Outside Force	6,920,183	6	1,967,898	6
Material	216,185	8	168,952	8
Weld/Joint	57,777,281	4	13,270,709	4
Equipment	1,013,223	7	312,288	7
Incorrect Operations	20,130	10	434	10
Other	59,835	9	19,134	9
Missing Value	93,849,435	3	23,974,829	2

Table E3.3: Risk Score/Foot and Ranking by District Western Region

Threat	Aberdeen		Bellingham		Bremerton		Longview		Mt. Vernon	
	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking
Corrosion	3.063	3	2.038	2	1.918	3	7.270	1	2.075	3
Natural Forces	0.878	5	0.598	5	4.691	2	0.251	5	0.546	5
Excavation Damage	4.929	2	5.590	1	7.471	1	1.371	3	3.244	1
Other Outside Force	0.168	6	0.175	6	0.173	6	0.243	6	0.140	6
Material	0.001	8	0.015	8	0.003	8	0.002	9	0.006	8
Weld/Joint	1.554	4	1.226	4	1.357	4	0.975	4	1.161	4
Equipment	0.027	7	0.030	7	0.029	7	0.023	7	0.025	7
Incorrect Operations	0.000	9	0.001	10	0.001	10	0.000	10	0.000	10
Other	0.000	9	0.002	9	0.003	9	0.002	8	0.001	9
Missing Value	5.081	1	1.990	3	0.631	5	5.600	2	2.423	2
Total Risk	15.700		11.664		16.276		15.736		9.622	

Table E3.4: Risk Score/Foot and Ranking by District Central Region

Threat	Kennewick		Walla Walla		Wenatchee		Yakima	
	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking
Corrosion	2.204	2	2.982	2	5.431	2	3.012	2
Natural Forces	1.158	4	0.550	5	0.762	5	0.367	5
Excavation Damage	9.590	1	9.014	1	2.779	3	5.039	1
Other Outside Force	0.148	6	0.267	6	0.203	6	0.353	6
Material	0.001	8	0.001	9	0.010	8	0.190	8
Weld/Joint	1.106	5	2.412	3	2.406	4	1.911	4
Equipment	0.013	7	0.024	7	0.051	7	0.208	7
Incorrect Operations	0.000	9	0.001	9	0.000	9	0.188	10
Other	0.000	9	0.003	8	0.001	10	0.189	9
Missing Value	1.644	3	0.575	4	5.622	1	2.482	3
Total Risk	15.863		15.831		17.265		12.244	

Table E3.5: Risk Score/Foot and Ranking by District Southern Region

Threat	Bend		Eastern Oregon		Pendleton	
	Total Score	Ranking	Total Score	Ranking	Total Score	Ranking
Corrosion	1.018	3	2.509	2	2.658	2
Natural Forces	0.654	5	0.603	5	0.712	5
Excavation Damage	8.921	1	0.922	4	3.903	1
Other Outside Force	0.114	6	0.292	6	0.163	6
Material	0.018	8	0.008	8	0.002	8
Weld/Joint	0.881	4	1.301	3	1.236	4
Equipment	0.028	7	0.013	7	0.021	7
Incorrect Operations	0.000	10	0.000	9	0.000	10
Other	0.002	9	0.000	9	0.001	9
Missing Value	1.295	2	3.665	1	2.192	3
Total Risk	12.931		9.312		10.887	

4.0 STANDARD DEVIATION ANALYSIS ON TOTAL RISK MAINS

4.1 Overview

This section provides the standard deviation results for the Company for each model run. The Standard deviations are colored by severity in the model to evaluate and prioritize risk, green is used for low risk and red is used for high risk with color escalation from green to red. This analysis allows us to see how the standard deviation has changed between model runs and compare results. It also allows for uniform coloring for risk comparison.

Table E4.1: Standard Deviation Ranges

Standard Deviation	Coloring	2011 Model Run	2012 Model Run	2013 Model Run	2014 Model Run
< -0.5	green	0 - 4.65	0 - 5.56	0.0– 6.33	0.0 - 8.20
-0.5 to -0.17	Light green	4.66 - 8.81	5.56 - 9.61	6.33 – 12.16	8.20 – 14.01
-0.17 to .17	Green-yellow	8.82 - 12.96	9.61 - 13.66	12.16 – 18.0	14.01- 19.82
0.17 to 0.50	yellow	12.97 - 17.11	13.66 - 17.70	18.0 - 23.84	19.82-25.63
0.50 to 0.83	Yellow-orange	17.12 - 21.26	17.71 - 21.75	23.84 - 29.64	25.63-31.43
0.83 to 1.2	Bronze/gold	21.27 – 25.41	21.75 - 25.79	29.64 - 35.5	31.43-37.24
1.2 to 1.5	Light orange	25.42 – 29.57	25.80 - 29.84	35.5 - 41.36	37.24-43.05
1.5 to 1.8	orange	29.58 – 33.72	29.85 - 33.88	41.36 – 47.2	43.05-48.86
1.8 to 2.2	Dark orange	33.73 – 37.87	33.88 – 37.93	47.2 – 53.0	48.86-54.66
2.2 to 2.5	Orange-red	37.88 - 42.02	37.94 – 41.97	53.0 – 58.9	54.66-60.47
> 2.5	red	46.18 - 429	41.98 - 309	58.9 - 321	60.47-326.4

5.0 TIME DEPENDANT AND TIME INDEPENDENT RISK EVALUATION

5.1 Overview

This section provides the primary threat categories that fall into time dependent and time independent risk.

Table E5.1: Time Dependency Risk Categories

Time Dependent Risk	Time Independent Risk
Corrosion	Outside Force
Equipment Failure	Excavation Damage
Incorrect Operation	
Material	
Natural Force	
Weld/Joint Failure	
Other	
Missing Values	

6.0 MODEL VALIDATION SUMMARY

6.1 Overview

This section provides a summary of the model validations that have taken place. For additional information on the personnel involved in the validation see Appendix J – *Subject Matter Expert*

Table E4.1: Model Validation Summary

Date of Model Run	Is Validation Needed (Yes/No)	Date of Model Validation	Comments
3-11-2013	Yes	3-25-2013	Model Validated by comparing model risk category scoring weighting to CNGC leak history trending.
3-1-2014	No	N/A	No major changes to risk inputs beside Missing value, determined that no validation was needed.
3-4-2015	No	N/A	No major changes to risk inputs, no validation needed.

APPENDIX F
ACCELERATED ACTIONS

Appendix F – Accelerated Action

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1.0 SUMMARY OF ACCELERATED ACTION

1.1 Overview

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
5.3.1.1 A/A Action Implementation	6.0 Completed Additional or Accelerated Action Forms	N/A
5.3.2 Accelerated Action Documentation	3.0 Additional or Accelerated Action	F3.1
6.5.2 Accelerated Action Effectiveness Review and Criteria	4.0 Performance Measures Specific to A/A's 5.0 Additional or Accelerated Action Review	F4.1 F5.1, F5.2

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded and summarized in the following table. Annual data updating does not need to be recorded here.

Table F2.1: Appendix F Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised BY
3/15/2013	Creation	Creation of new appendix for AA Summary and Effectiveness tracking includes: AA summaries, effective summery, AA specific performance measures, and storage for active AA forms.	Renie Sorensen & Kathleen Chirgwin
2/25/2014	Updates	Added discontinue criteria of trending down 25% in one year to Section 5.3. Added WA excavation damage Accelerated Action implemented.	Kathleen Chirgwin
3/30/2015	Updates	Added column to table F4.1 to track baseline model	Renie Sorensen

3.0 ADDITIONAL OR ACCELERATED ACTION

3.1 Overview

This section contains a summary of all implemented Accelerated Actions currently in effect at CNG.

Table F3.1: Accelerated Action Summary

Accelerated Action	Implementation Date	Threat	Performance Metric	Operating Region/District	Assigned By
Anacortes Pipe Replacement	Jan 10, 2012	Corrosion	Corrosion risk score in Anacortes	NW Region/Mt. Vernon	Renie Sorensen
Bend Pipe Replacement	Mar 5, 2012	Corrosion	Corrosion Risk score in Bend	Southern Region/Bend	Kathleen Chirgwin
Longview Pipe Replacement	Jan 10,2012	Corrosion	Corrosion risk score in Longview	NW Region/Longview	Renie Sorensen
GIS Cleanup	Nov 2011	Missing Values	Total Missing Values Risk Score	System Wide	Kathleen Chirgwin
Pilot Rock Testing	May 18, 2012	Investigation only	Investigation only	Southern Region, Pendleton	Kathleen Chirgwin
Shelton Pipe Replacement	Feb, 1 2013	Corrosion	Corrosion Risk score in Shelton	NW Region/ Aberdeen	Renie Sorensen
WA Excavation Damage Outreach	June 15, 2013	Excavation Damage	Excavation Risk in WA	Western and Central Region	Kathleen Chirgwin & Renie Sorensen
OR Excavation Damage Outreach	June 15, 2015	Excavation Damage	Excavation Risk in OR	Southern Region	Kathleen Chirgwin & Renie Sorenson

4.0 PERFORMANCE MEASURES SPECIFIC TO A/A'S

4.1 Overview

Some Accelerated Actions cannot be evaluated using the standard set of performance measures, thus it becomes necessary to temporarily gather and trend additional data. A summary of this collected data is provided in this section. Trending Baseline will either be an average of the previous 5 years of data or the baseline established from the August 2011 data using current model calculations, depending on type of metric chosen.

Percent Change= (Current yr-Trending Baseline)/Trending Baseline*100

Table F4.1 A/A Performance Measure Trending

Metric	Associated Accelerated Action	Baseline Model	Current Trending Baseline	Current metric Value	% Change Baseline	% Change Previous year	Trending Observations
Corrosion Risk/ foot in Anacortes	Anacortes Pipe Replacement	Aug 2011	2.719	2.276	-16.3%	14.6%	Increase due to no pipe removal
Corrosion Risk/ foot in Longview	Longview Pipe Replacement	Aug 2011	10.674	7.814	-26.8%	-11.5%	Decreasing
Corrosion Risk/ foot in Bend	Bend Pipe Replacement	Aug 2011	1.224	0.994	-18.8%	2.2%	Slight increase from previous year
Corrosion Risk/ foot in Shelton	Shelton Pipe Replacement	Aug 2011	3.369	4.511	33.9%	3.0%	slight increase from previous year
Missing Value Risk in Company	GIS Cleanup	March 2014	126,856,530	117,824,278	-7.1%	-7.1%	Decreasing
Excavation Risk in WA	WA Excavation Damage Outreach	March 2013	5771.720	6408.231	14.5%	11.0%	Increase

5.0 ADDITIONAL OR ACCELERATED ACTION REVIEW

5.1 Overview

This section provides a location to record the annual review of accelerated actions and record.

5.2 Effectiveness Criteria

For an implemented A/A to be considered effective at reducing or maintaining risk the A/A performance metric analyzed for a given year cannot have a percent change greater than 10%.

Table F5.1: Implemented Accelerated Action Effectiveness Review

Accelerated Action	Performance Metric	Effective at Risk Reduction (Yes/No)	Previous Year Trending/ Comments	Reviewed By
Bend Pipe Replacement	Corrosion Risk In Bend	Yes	Slight increase in previous year trending but no concerns since 18.8% lower than the baseline run corrosion numbers. Bend Phase 1, 2, 3 were mapped in 2014 model run and Phase 4 will be completed in 2015.	Kathleen Chirgwin
Longview Pipe Replacement	Corrosion risk in Longview	Yes	Phase 3 of the replacement caused a percent change of -26.8% from Base Line and - 11.5% from Previous year	Renie Sorensen
Anacortes Pipe Replacement	Corrosion risk in Anacortes	Yes	Phase 2 Replacement did not cause much change due to no pipe removal during this phase.	Renie Sorensen
GIS Cleanup	Missing Value Risk Score	N/A	Change of -7.1 from new Baseline	Renie Sorensen
Shelton Pipe Replacement	Corrosion Risk in Shelton	N/A	No action has been taken at this point	Renie Sorensen
Excavation Risk in WA	WA Excavation Damage Outreach	Yes	Excavation Risk in WA increased 14.5% from baseline and 11% from previous year	Renie Sorensen

5.3 Discontinue A/A Criteria

For an A/A to be discontinued and considered effective at addressing risk, the A/A performance metric percent change compared to the established baseline must trend down at least 5% for three consecutive years or trend down 25% in single year.

Table F5.2: A/A Discontinue Trending

Accelerated Action	Performance Metric	Can A/A Be Discontinued (Yes/No)	3 Years Trending Results			Reviewed By
			2012	2013	2014	
Bend Pipe Replacement	Corrosion Risk In Bend	No	-17.5%	-3.6%	2.2%	Kathleen Chirgwin
Longview Pipe Replacement	Corrosion risk in Longview	No	-11.7%	-6.4%	-11.5%	Renie Sorensen
Anacortes Pipe Replacement	Corrosion risk in Anacortes	No	N/A	-22.8%	14.6%	Renie Sorensen
GIS Cleanup	Missing Value Risk Score	No	-23.7%	N/A	-7.1%	Renie Sorensen Establish New Base Line
Shelton Pipe Replacements	Corrosion Risk in Shelton	N/A	N/A	N/A	N/A	No review needed. Project not started.
Excavation Risk in WA	WA Excavation Damage Outreach	No	N/A	-3.0%	14.5%	Renie Sorensen

6.0 COMPLETED ADDITIONAL OR ACCELERATED ACTION FORMS

6.1 Overview

This section is for the storage of active Additional or Accelerated Action forms. Discontinued Additional or Accelerated Action forms will be archived on Engineering SharePoint.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas Corporation **Completed By:** Kathleen Chirgwin

Operating Region/District: Southern Region/Bend District **Completed Date:** March 5, 2012

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: Replacement of pre-manufactured gas system installed in 1930's in downtown Bend. This vintage coal tar wrapped steel pipe will be replaced with new plastic system with PE mains and services.

Threat(s) A/A Addresses: Corrosion. Material and Missing Value risk.

Reason for A/A Action: This pipe has extensive corrosion due to the vintage of pipe and has been potholed to find wall loss in excess of 70% and is commonly referred to as "swiss cheese" by district and Cascade employees who have worked on this system. In SME interviews Downtown Bend pipe has been identified as one of Cascade's riskiest systems due to vintage of pipe, leaks, and severe corrosion concerns. Downtown Bend Pre-CNG pipe is also identified in model as high risk and it is predominate in the Top 100 OR Main risk, Top 50 OR Service Risk, and Top 25 OR Corrosion Risk.

Description of locations that A/A will be implemented: Replacement of pre-cng pipe located in downtown Bend with new PE system.

A/A Implementation Date: 1/1/2012 **Duration:** Until manageable risk level is obtained for Downtown Bend.

Does A/A Action require added performance metrics? ☐YES ☒NO **If yes, describe new metric(s) and collection schedule:**

Effects of this replacement will be tracked in pre-cng statistics (as we replace pre-cng pipe pre-cng pipe totals will be driven down), overall risk scoring for Bend district and town of Bend will be reduced (specifically material failure risk, corrosion risk, and missing value risk), it is anticipated that Bend district leaks will be reduced over time with this replacement since this pre-cng pipe in downtown bend is where majority of leaks are found in Bend district, and as replacement phases are complete it will be eliminated from Top 100 OR main risk, Top 50 OR Service Risk, and Top 25 OR Corrosion risk evaluation.

Supporti

gas system in downtown Bend. With this A/A since replacement will happen over multiple year's executive summary, cost estimate and map of replacement for each phase completed will be included.

Additional Comments: This pre-cng manufactured gas system in Bend sums to approximately 25 miles of main. Challenges to this replacement project include construction in downtown infrastructure, construction within a highly populated and heavily visited tourist area, solid rock construction, and meeting all of City of Bends requirements and specifications**.** As this replacement continues and condition/integrity is assessed it will allow for greater knowledge concerning severity, which will allow Cascade to further validate the model on risk assessment and determine aggressiveness of pipe replacement.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas Corporation **Completed By:** Kathleen Chirgwin

Operating Region/District: Entire Company **Completed Date:** November 2011

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: GIS Data Entry/Cleanup.

Threat(s) A/A Addresses: Missing Values

Reason for A/A Action:

Cascade is making extensive efforts on data cleanup, data scrubbing, and data entry in GIS mapping records which drives Cascade's DIMP model. This A/A will be ongoing since the more system data we can collect on our operating system the more accurate Cascade can asses and analyze system risk. In Cascade's current DIMP model we assign risk to mains, leak reports, services, and valves which are missing critical system information like pipe material, install date, work order id, leak information, etc. After analyzing Cascade's top risk identified by March 2012 model run, the majority of Cascade's highest risk is due to missing values in attribute data, which is not accurate to SME/Company knowledge of Cascade's system. Cascade also wants to use this A/A to track GIS cleanup efforts which is heavily driven and been accelerated by our DIMP model.

Description of locations that A/A will be implemented: This A/A will be implemented throughout all districts in Cascade.

A/A Implementation Date: October 2011 **Duration:** Until Satisfied with GIS Data Cleanup

Does A/A Action require added performance metrics? ☐YES ☒NO **If yes, describe new metric(s) and collection schedule:**

As data is inputted to GIS Data records, missing value risk in DIMP model will be driven down over time. As missing value risk is cleaned up in GIS data you will see missing value risk in DIMP model be driven down, specifically in OR/WA Top 100 Main and Top 50 Service Risk Analysis. As the missing value risk is filled in it will allow for more accurate model runs and system risk analysis.

Supporting Documentation: Model risk for missing value risk per 1000 ft in district and towns and Missing data numbers in mains and service records model data breakdown.

Additional Comments:

Over the past few years Cascade has transitioned from CAD mapping to GIS mapping. In 2010 Cascade went live with full GIS Mapping. The GIS mapping conversion consisted of digitizing all of Cascade's paper leak and asbuilt records and building attribute databases. Cascade is still making extensive efforts on data cleanup, including data entry and data scrubbing on unknown install dates, asbuilt records, and pipe material. As part of this cleanup effort GIS employees are currently traveling from district to district to capture missing data, digitize old paper maps, and provide additional training on asbuilt mapping.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas Corp
Operating Region/District: Pendleton, OR

Completed By: Kathleen Chirgwin
Completed Date: May 18, 2012

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented:

Cascade completed a DIMP investigation into the 6" Pilot Rock Line due to Pendleton District corrosion and integrity concerns. This investigation consisted of gathering all company knowledge available on the integrity of this line. To gather this information all asbuilt information was researched, all leak history documentation was reviewed, all 625 Integrity Management Dig Report was reviewed, the DIMP model scores were assessed, and several Cascade employees with SME on this line were interviewed. The overall goal of this investigation is to identify areas of concern on the Pilot Rock Line and address how to investigate and assess risk for pipelines with areas of concern for Cascade's Distribution Integrity Management Program.

Threat(s) A/A Addresses:

Corrosion concerns due to lack of Cathodic Protection on 6" HP Pilot Rock Line.

Reason for A/A Action:

Engineering's recommendation is to confirm the corrosion concern with further testing in the identified areas of concern. To confirm the condition of the pipe engineering recommends pipeline exposures by potholing and documenting with 625: Integrity Management Dig Reports or ECDA Current Mapping by a consultant to pinpoint anomalies and then expose anomalies with potholing. Engineering recommendations on potholing is to pothole every 300-400 feet in the area of concern and assess pipe condition by removing 2ft of pipe coating. Once further testing is complete Engineering will review and make a recommendation on how to proceed.

Description of locations that A/A will be implemented:

The two areas on Pilot Rock line with "suspect" pipe totals approximately 6000 ft of pipe. The first area of concern is 3000 ft north and 1000 ft south of 2010 Plidko Clamp repair and the second is 1000 ft North and 1000 ft south of the 2005 1500 ft replacement near the Gun Club.

A/A Implementation Date: May 18, 2012

Duration: Until further testing and evaluation is complete by Cascade Engineering.

Does A/A Action require added performance metrics? ☐YES ☒NO **If yes, describe new metric(s) and collection schedule:**

Supporting Documentation:

Pilot Rock Analysis Summary, Subject Matter Expert Interviews, Map of Area of Concern, and further testing to determine integrity of Pilot Rock HP Line in identified areas of concern.

Additional Comments:

Once further testing on area of concern on Pilot Rock is complete, engineering will review and make a recommendation on how to restore integrity to this line if necessary and or coordinate further investigation.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas

Completed By: Renie Sorensen

Operating Region/District: Northwest Region/Mount Vernon District

Completed Date: January 10, 2012

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: Replacement of bare steel and Pre-CNGC manufactured gas pipe in Anacortes, WA, with new PE pipe (Approximately 75,000 feet of main).

Threat(s) A/A Addresses: Corrosion, and Unknown data.

Reason for A/A Action: This area has a history of corrosion leaks, and pipe that is known to be in poor condition, presence of corrosion, threaded fittings, buried flanged fittings. Due to the age of this pipe there is a lack of information causing a high missing value risk. Pipe also has an MAOP of 10 psi which causes some deliverability issues during the winter months.

Description of locations that A/A will be implemented: City of Anacortes, WA, on Pre-CNGC/FISH pipe portion of the system. Northern and eastern ends of the city.

A/A Implementation Date: January 1, 2012

Duration: Until risk has reached a manageable level in the Anacortes replacement area.

Does A/A Action require added performance metrics? ☐YES ☒NO **If yes, describe new metric(s) and collection schedule:** This AA will be tracked using Corrosion risk score for the City of Anacortes.

Supporting Documentation: See SME interviews from Mount Vernon District, executive summaries, cost estimates, map of project area.

Additional Comments: This project was originally brought to light prior to DIMP implementation by district personnel. Information gathered from DIMP points more at Mount Vernon as having a larger risk. District personnel have identified this area as the area of greater concern. This supports the replacement of the Pre-CNGC pipe in Anacortes.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas **Completed By:** Renie Sorensen

Operating Region/District: Northwest Region/Longview District **Completed Date:** January 10, 2012

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: Replacement of bare steel and Pre-CNGC pipe in Longview and Kelso, WA with new PE pipe.

Threat(s) A/A Addresses: Corrosion, and Unknown data.

Reason for A/A Action: This area has a history of leaks, and pipe that is known to be in poor condition. Due to the age of this pipe information is unavailable causing high risk from missing values. The area is known to be bare pipe and prone to corrosion.

Description of locations that A/A will be implemented: Cities of Longview and Kelso, WA, on bare pipe portion of the system.

A/A Implementation Date: January 1, 2012 **Duration:** Until risk has reached manageable levels in cities of Longview and Kelso

Does A/A Action require added performance metrics? ☐ YES ☒ NO **If yes, describe new metric(s) and collection schedule:** This AA will be tracked corrosion risk score for the City of Longview.

Supporting Documentation: See SME interviews from Longview District. Executive summaries, cost estimates, area maps.

Additional Comments: This project was originally brought to light prior to DIMP implementation. Information gathered from DIMP supports the replacement of the bare steel in the Longview/Kelso area. SME interviews also point to this area as an area of high concern.

FORM 21760: ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

Operating Company: Cascade Natural Gas **Completed By:** Renie Sorensen

Operating Region/District: NW Region/Aberdeen **Completed Date:** 2/13/13

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: Replacement of Pre-CNGC and bare pipe in the City of Shelton, WA.

Threat(s) A/A Addresses: Corrosion and equipment failures (Buried valves)

Reason for A/A Action: Shelton Ranks high in our risk model. City of Shelton is also doing major road work and the opportunity to replace pipe is ideal.

Description of locations that A/A will be implemented: Replacement of Pre-CNGC pipe in the City of Shelton prior to road construction

A/A Implementation Date: Project was implemented February 1, 1013

List A/A Performance Metric to determine A/A Effectiveness and when A/A can be discontinued:

Corrosion Risk for the City of Shelton

Does A/A Action require added A/A performance metrics? ☒ YES ☐ NO

If yes, describe new metric(s) and collection schedule:

Corrosion Risk for the City of Shelton WA

Supporting Documentation: See SME Forms 2012 Aberdeen District

Additional Comments: Shelton was identified as an area of the system with high risk by both the model and SMEs in the area. The timing is a bonus with the road construction that the city is performing currently.

ADDITIONAL OR ACCELERATED ACTION IMPLEMENTATION

21760(7-11)

Operating Company: Cascade Natural Gas Corporation **Completed By:** Kathleen Chirgwin

Operating Region/District: State of Washington **Completed Date:** June 15, 2013

Additional or Accelerated (A/A) Action Plan

Description of A/A Action implemented: Setup a conference with every professional contractor that has damaged Cascade facilities in the past year. Discussion will be documented on a public awareness form by selected Washington districts.

Threat(s) A/A Addresses: Excavation Damage

Reason for A/A Action: 35 percent change increase in main risk per 1000 ft for excavation risk in the State of Washington.

Description of locations that A/A will be implemented:

Each year this accelerated action will be implemented in select Washington districts based on Damages per 1000 locates statistics to target the districts with the highest excavation damages.

2013 Districts

District	Region	2012 Damages per 1000 locates
Walla Walla	Central	10.3
Aberdeen	Western	7.4
Yakima	Central	6.5
Mt Vernon	Western	5.3

A/A Implementation Date: 6/15/2013 **Duration:** See Discontinue A/A Criteria in Appendix F – Acceleration Actions

Does A/A Action require added performance metrics? ☐YES ☒NO **If yes, describe new metric(s) and collection schedule:**

Supporting Documentation: This A/A documentation can be found on Sharepoint in the Public Awareness Folder in the Excavator folder for the applicable year for the selected districts..

Additional Comments: None.

APPENDIX G
SUBJECT MATTER EXPERT

Appendix G – Subject Matter Expert

Table of Contents

1.0 SUMMARY OF SUBJECT MATTER EXPERT

1.1 Overview

The objective of this appendix is to summarize results of SME panel discussions and validations. It also provides a location to summarize and document Individual SME concerns.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
1.6 Subject Matter Expert Involvement	All sections	All Tables
1.6.2 Subject Matter Expert Panel	3.1 SME Panel	G3.1
3.4.2 Internal Source	3.2 Individual SME Concerns	G3.2

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table G2.1: Appendix G Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Creation of new appendix to summaries SME involvement and for storage of completed SME forms	Renie Sorensen & Kathleen Chirgwin
5/9/2013	Content Revision	Removed content from appendix that was not needed.	Renie Sorensen

3.0 SUBJECT MATTER EXPERT SUMMARY

3.1 SME Panel

The SME panel members are used to validate the risk model, and in scoring and weighting used in the risk model.

Table G3.1: SME Panel Meeting Summary

Date	Purpose	Summary of Results
2/12/2013	Model Calculation Validation	Modifications were made to several model calculations. All other calculations were confirmed. Also included discussion of other potential threats to the system. Please see meeting notes in section 4.1.1 under Model Calculation Validation 2/12/2013 for full detail of changes.
2/25/2012	Model Validation	Panel shown 2012 model results and were in agreement that the model is an accurate representation of CNGC's risk. Please see meeting notes in section 4.1.1 under Model Validation 3/25/2013 for full detail.

3.2 Individual SME Concerns

When concerns are communicated to engineering through an SME interview they are summarized in this section where they can be examined and determine if the concern is a threat or potential threat to the distribution system. Concerns deemed to be threats will be added to the risk model, and those deemed to be potential threats will be moved to the potential threat table in Appendix C.

Table G3.2: Individual SME Concern Summary

Concern	District where Concern was Identified	SME Name and Title	Date Concern Addressed to Engineering
Braised Service Tees	Wenatchee	Steve Knutson	7/12/2012
Rocky Backfill	Yakima	Richard Nave	7/11/2012
Non operating flange Valves (buried)	Aberdeen	Kevin Berner	7/20/2012
Pipe Depth	Aberdeen	Kelly Campbell	7/20/2012
Double Service lines	Shelton	Jesse Middleton	7/20/2012
Poor Weld Concerns	Mount Vernon	John Rodriguez Jr.	7/19/2012
Idle Service Stubs	Moses Lake	Lori Shimek	7/12/2012

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4.0 SME FORMS STORAGE

4.1 Overview

SME forms 21764 for SME Panel will be stored here for Ten years. All older forms will be archived and available upon request only.

4.1.1 SME Panel Storage

Model Calculation Validation 2/12/2013

Model Validation 3/25/2013

FORM 21764: SME PANEL DECISIONS

Person(s) Conducting the Panel Meeting: Kathleen Chirgwin Panel Date: 2/12/2013

Purpose of SME Panel Meeting:

[X] RISK MODEL CALCULATION CHANGES [ ] MODEL VALIDATION [ ] RISK MITIGATION [ ] RISK MODEL PERFORMANCE [ ] OTHER (EXPLAIN)

Overview of Model Calculation weighting and risk sub-threats.

SME Panel Members

SME Name: Sam Grant SME Job Title: District Manager

Operating Company: CNGC Years of Experience: 32

Operating Region: Wenatchee District

Other relevant information: In district Wenatchee district all 32 years in different positions.

SME Name: Ryan Pilvratsky SME Job Title: Corrosion Manager

Operating Company: CNGC Years of Experience: 7 years

Operating Region: General Office

Other relevant information:

SME Name: Dan Harris SME Job Title: District Manager

Operating Company: CNGC Years of Experience: 20 years

Operating Region: Pendleton District

Other relevant information: 11 in Bremerton rest of time in Pendleton

SME Name: Seth Boyle SME Job Title: Welder

Operating Company: CNGC Years of Experience: 16 years

Operating Region: Eastern Oregon

Other relevant information: 5 years with CNGC 11 years with NW Natural

SME Name: Chanda Marek SME Job Title: Director, Western Region

Operating Company: CNGC Years of Experience: 20 years

Operating Region: Western Region

Other relevant information: 17 years with CNGC (engineering and region operations) 3 years with Chevron (engineer)

SME Name: John Brand SME Job Title: District Operations Manager

Operating Company: CNGC Years of Experience: 35 Years

Operating Region: Bend

Other relevant information:

SME Name: Joff Staudenmaier — SME Job Title: Director, Southern Region

Operating Company: CNGC — Years of Experience: 18 years

Operating Region: Southern Region

Other relevant information:

SME Name: Mike Clapp — SME Job Title: Director, Central Region

Operating Company: CNGC — Years of Experience: 18 Years

Operating Region: Central Region

Other relevant information:

SME Name: John Rodriguez — SME Job Title: Service Mechanic

Operating Company: CNGC — Years of Experience: 32 years ~34 YRS

Operating Region: Mt. Vernon District

Other relevant information: METER READER, BACK HOE OPERATOR, WELDER, & CLERK

SME Name: — SME Job Title:

Operating Company: — Years of Experience:

Operating Region:

Other relevant information:

Summary of Panel Decisions:

The focus of the discussion was on weighting factors that will be implemented in the next DIMP Model run. From this discussion several modifications will take place to the weighting and the sub-threat categories, (see changes section). Other input included identifying potential threats including: Polyken wrap, powder coated meter bar corrosion, and accessing flooded vaults. Other topics of discussion were Excavation damage on newly installed facilities, unmaintained valves, idle risers and stubs, depth of pipe due to grade changes, HPSS risk, and casing vent damage. For more detail on these topics please see attached meeting notes.

Are Changes Required to the Program? ☒Yes ☐No

If yes, changes to: ☒Risk Model ☐Plan ☐ GIS ☐ Performance Metrics ☐ Other (Describe)

Describe Changes:

Changes include: shifting dates for ability to locate PE pipe from 1979 to 1995 in Excavation threat, added Weld/Joint risk for pre 1980 steel pipe, CP protection for underground steel in Eastern and Central regions in Corrosion, shift material age for steel pipe from 1970 to 1978 in corrosion threat, removal of Railroad Crossing sub-threat in Other Outside force, change consequence factor for pinching ability for steel greater than 4 inches.

Interviewer:	Kathleen Chirgwin	Date: ___/___/____
SME:	Ryan Privratsky	Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: 2/20/2013
SME:		Date: 2/21/2013
SME:		Date: 2/21/2013
SME:		Date: 2/22/13
SME:		Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: ___/___/____
SME:		Date: ___/___/____

Notes from SME Panel Meeting (2-12-2013)

Prepared by: Kathleen Chirgwin on 2/12/2013

Panel Members: Jeff Staudenmaier, Dan Harris, Sam Grant, John Brand, John Rodriguez, Mike Clapp, Chanda Marek, Ryan Privratsky, Seth Boyle, Kathleen Chirgwin, Renie Sorensen

SME Panel agreed that most excavation damage occurs on newly installed services and mains due to fencing, sprinkler systems, and landscaping.

Discussed unknown leaking valves, when leaks are fixed by exposing and greasing there is no precedence on removing valves, typically valves are greased and then backfilled and at some time in future plug valve grease will dry up again and have a future leak.

Discussed problems with tracer wire on PE with early installation techniques, SME panel identified problem with installation is due to bad wire nuts and they did not twist wires tightly because they were afraid it would damage/shear the wires, by not twisting the wire the wire could be easily pulled apart. SME Panel explained that this poor tracer wire technique was used until early to mid-1990's when it was replaced with improved splice kits.

- Adjust model risk on excavation, sub threat ability to locate PE/Mains and service for PE installed up to 1995 (previously was installations prior to 1979).

Discussed risk on idle service risers, this is when a full service line is ran to the riser and no meter has ever been contacted (in the day FISH was paid for number of services ran so when they installed the town they ran services to every house and some house due to electrical rates never connected a gas service). Panel mentioned if these are PE they can difficult to locates because there is no way to make a connection to locator since riser is buried, causing paint marking to be inaccurate up to 10ft. SME panel mentioned that some of these have very good mapping records in certain towns but some towns have no records and are very difficult to locate or even know if a property has an idle service riser (Shelton mentioned).

Discussed poor weld concerns. SME panel identified late 70's and early 1980's as when Cascade went to higher weld standards. Prior to 1980 Cascade did not have welder qualifications and braised tee installations were common in certain districts. SME's mentioned that welds on FISH pipe are good but welds on Pre-CNG pipe vary in towns/districts.

- Add Weld/Joint risk to steel pipe installed prior to 1980 due higher weld standards implemented by Cascade in 1980.

Discussed CP protection with SME's. In dry climates with sand/rocks (Eastern WA/Oregon) CP protection is much harder to protect and is much more corrosive when CP protection is interrupted compared to wet conditions on Westside. To remediate this risk, SME panel mentioned that we are installing more rectifiers to protect smaller areas. CP protection is especially difficult during very dry conditions in summer. CP protection is easier to protect in wet soil conditions.

- Add corrosion risk subthreat CP protection to all below ground steel pipe installed in Eastern WA/Oregon (perhaps we can use rainfall data or soil data)

Discussed Polyken Tape, SME's identified Polyken tape as risk because Polyken tape allow moisture to enter tape on above ground facilities causing corrosion. SME Mentioned that Polyken tape was used widespread throughout Cascade for underground, above ground, and interface pipe wrap. SME mentioned that Polyken tap was used on Pre-CNG/FISH pipe up until 1980 when we switched to greenline tape. Since main concern with Polyken tape is moisture SME's agreed that Polyken tape risk is higher on Westside. Currently Polyken tape is listed as an AOC and when it is discovered it is removed and rewrapped with greenline tape.

- Add polyken tape to potential threats table, in GIS data we have no way of knowing where greenline wrap is versus polyken tape especially if they replace the polyken tape when discovered.

Discussed pipe depth risk, SME mentioned that Road grades add risk when roads are lowered and HP lines are left with 8inches of cover, we also have risk during road lowering due to heavy equipment loading and potential for graders/dozers to damage pipe.

Discussed risk due to atmospheric salt water, SME identified issues with meter bars deteriorating due to salt water environment. SME believes the salt water environment caused a reaction with the coating on meter bars to rapidly degrade due to material defect. SME's believed this problem was resolved in late 1990's when we went to powder coated meter bars. This meter bar issue was isolated to meter bars with this manufacturing issue installed near coastal salt water conditions. SME's on Westside mentioned we still have 1000's of meter bars that need to be replaced due to this issue.

- Add these meter bars to potential threats
- Look into years that CNGC used these defective meter bars with poor coating and assign material failure risk to service lines along coastline (2014 model run).

Discussed Cascade's history on when we went to Cathodic protection. SME clarified that federal mandate for cathodic protection was 1970 but Cathodic protection for majority of Cascade's systems came on line in late 1970's.

- Adjust corrosion sub threat material age for CP protection to add risk to steel pipe up until 1978 (previously was 1970).

Discussed risk on HPSS, SME panel does not think HPSS pose Equipment Failure risk even though there is no annual maintenance performed and rupture disk slam shuts provide excellent over pressurization protection.

SME panel believes that these facilities are visually inspected yearly on line walks. The only risk identified on HPSS by SME panel is risk if facility is in vault, risk if facility is against a house, and risk due to vehicular damage.

- Add locations of facilities in vaults to missing data

Discussed risk on closed valves, SME panel does not think valve that are normally closed pose risk since these valves will have locks.

- Remove closed valve risk from Equipment Failure risk

SME identified equipment failure risk due to vaults which are prone to flooding which have the potential for failure. Flooded vaults are difficult to inspect and perform required maintenance activities. SME mentioned that failure is low on these facilities since it is standard practice to vent/snorkel regulator/relief vents.

- Add vault flooding risk to potential threats (since we do not have reasonably available data we will need to add this data to GIS and then we can assign risk)

Discussed outside force damage, SME do not think risk should be added for RR crossing or major highway crossings due to vehicular/train loading. SME's mentioned that RR crossing that are 5ft deep require casings and RR crossing 10 ft in depth require no casing, SME do not believe loading affects pipe.

- Remove RR Risk Crossing from Other Outside Force Risk

Discussed vehicular damage on facilities, SME's believes this should have low risk because if facility gets run over we typically move station or provide additional protection to eliminate chance of event reoccurring.

Discussed casings, SME panel does not see risk for casing in outside force damage, casings are checked on quarterly patrol to make sure they are open to atmosphere and free from debris. SME believes the majority of risk to casing is due to shorting which can lead to corrosion.

- Add Shorted Casing risk to potential threats.

Discussed Steel Tapping Ability and SME's mentioned that all districts can squeeze/pinch 2' HP or IP Steel with a hydraulic pincher and some districts have equipment to squeeze 4" IP/HP steel main.

- In consequence change material type to pinching ability and only add risk to steel pipe greater than 4 inches (combine this into steel tapping ability) which require tapping equipment.

FORM 21764: SME PANEL DECISIONS

Person(s) Conducting the Panel Meeting: Kathleen Chirgwin **Panel Date: March 25, 2013**

Purpose of SME Panel Meeting:

☐ RISK MODEL CALCULATION CHANGES ☒ MODEL VALIDATION ☐ RISK MITIGATION ☐ RISK MODEL PERFORMANCE ☐ OTHER (EXPLAIN)

Meeting was conducted using:

☐ IN PERSON ☐ WEB/CONFERENCE CALL ☒ IN PERSON & WEB/CONFERENCE CALL ☐ OTHER (EXPLAIN)

Summary of Panel Decisions:

2012 DIMP model results were presented to panel. Total Risk for mains and services by threat category was presented along with category risk weighting and ranking for OR, WA, and OR/WA combined. Panel was also provided with CNGC PHSMA leak history and leak history category weighting. SME panel validated 2012 Risk Model since model risk category weighting matched CNGC annual leak report weighting.

Are Changes Required to the Program? ☐ YES ☒ NO

If yes, changes to: ☐ Risk Model ☐ Plan ☐ GIS ☐ Performance Metrics ☐ Other (Describe)

Describe Changes (include implementation plan/schedule):

SME Panel Members (if more than 7, include another page)

1) SME Name: Sam Grant SME Job Title: District Manager
Operating Company: CNGC Years of Experience: 32 years
Operating Region: Wenatchee District
Other relevant information: In district Wenatchee district all 32 years in different positions.

2) SME Name: Dan Harris SME Job Title: District Manager
Operating Company: CNGC Years of Experience: 20 years
Operating Region: Pendleton District
Other relevant information: 11 years in Bremerton, rest of time in Pendleton.

3) SME Name: Chanda Marek SME Job Title: Director, Western Region
Operating Company: CNGC Years of Experience: 20 years
Operating Region: Western Region
Other relevant information: 17 years with CNGC (engineering and region operations) 3 years with Chevron.

4) SME Name: John Brand SME Job Title: District Operations Manager
Operating Company: CNGC Years of Experience: 35 years
Operating Region: Bend
Other relevant information: Worked in Walla Walla and Eastern Oregon as district manager.

5) SME Name: Mike Clapp SME Job Title: Director, Central Region
Operating Company: CNGC Years of Experience: 18 years
Operating Region: Central Region
Other relevant information:

6) SME Name: Steve Kessie SME Job Title: Director Operations
Operating Company: CNGC Years of Experience: 30+years
Operating Region:
Other relevant information: Worked as backhoe, service mechanic and district manager in Kennewick District.

Signatures (if more than 7 SME's, include another page):

CASCADE NATURAL GAS | GREAT PLAINS NATURAL GAS CO. | INTERMOUNTAIN GAS COMPANY | MONTANA-DAKOTA UTILITIES CO.

Interviewer: Kathleen Chirgwin Digitally signed by Kathleen Chirgwin DN: cn=Kathleen Chirgwin, o=Cascade Natural Gas, ou, email=Kathleen.Chirgwin@cngc.com, c=US Date: 2013.03.25 15:38:31 -07'00' Date: ___/___/___

1) SME: _____ Date: ___/___/___

2) SME: _____ Digitally signed by John Brand DN: cn=John Brand, o=Cascade Natural Gas, ou=Bend District, email=johnbrand@cngc.com, c=US Date: 2013.03.25 16:02:16 -07'00' Date: ___/___/___

3) SME: _____ Date: 3/25/2013

4) SME: _____ Date: 3/25/2013

5) SME: _____ Date: 3/26/2013

6) SME: _____ Date: ___/___/___

7) SME: _____ Date: ___/___/___

CNGC 2013 DIMP Model Results

WA

	Metric Description	2007-2011 Leak Average 5 Year Avg	5 Year Avg Weighting	Total Risk (Mains and Services Combined)	Total 2013 Model Risk Weighting	Risk Ranking
Hazardous leaks eliminated or repaired by cause	Corrosion	17.2	8%	109,668,264	21.9%	2
	Natural Forces	2.6	1%	53,395,397	10.7%	4
	Excavation Damage	140.2	62%	245,924,586	49.1%	1
	Other Outside Force	14.4	6%	6,463,446	1.3%	6
	Material	22	10%	289,266	0.1%	8
	Joint			55,061,610	11.0%	3
	Equipment	19.2	9%	1,184,330	0.2%	7
	Incorrect Operations	1.2	1%	19,101	0.0%	10
	Other	8.8	4%	72,191	0.0%	9
	Missing Value			29,032,647	5.8%	5
	Total	225.6	100%	501,110,838	100.0%	

Note: In PSHMA Reporting Material and Weld leaks are combined. Missing Values is not reported to PHSMA and is only considered in risk model.

OR

	Metric Description	2007-2011 Leak Average 5 Year Avg	5 Year Avg Weighting	Total Risk (Mains and Services Combined)	Total 2013 Model Risk Weighting	Risk Ranking
Hazardous leaks eliminated or repaired by cause	Corrosion	10.8	9%	18,054,290	18.4%	2
	Natural Forces	2.2	2%	8,137,571	8.3%	5
	Excavation Damage	52.6	44%	49,376,356	50.4%	1
	Other Outside Force	9.8	8%	1,648,903	1.7%	6
	Material	27.2	23%	199,320	0.2%	8
	Joint			11,797,985	12.0%	3
	Equipment	11.2	9%	280,355	0.3%	7
	Incorrect Operations	0.8	1%	1,424	0.0%	10
	Other	5.8	5%	11,906	0.0%	9
	Missing Value			8,513,528	8.7%	4
		120.4	100%	98,021,638	100.0%	

CNCG

	Metric Description	2007-2011 Leak Average 5 Year Avg	5 Year Avg Weighting	Total Risk (Mains and Services Combined)	Total 2013 Model Risk Weighting	Risk Ranking
Hazardous leaks eliminated or repaired by cause	Corrosion	28	8%	127,722,554	21.3%	2
	Natural Forces	4.8	1%	61,532,968	10.3%	4
	Excavation Damage	192.8	56%	295,300,942	49.3%	1
	Other Outside Force	24.2	7%	8,112,350	1.4%	6
	Material	49.2	14%	488,586	0.1%	8
	Joint			66,859,595	11.2%	3
	Equipment	30.4	9%	1,464,684	0.2%	7
	Incorrect Operations	2	1%	20,525	0.0%	10
	Other	14.6	4%	84,097	0.0%	9
	Missing Value			37,546,175	6.3%	5
	Total	346	100%	599,132,476	100.0%	

APPENDIX H
PERFORMANCE MEASURES

Appendix H - Performance Measures

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1.0 SUMMARY OF PERFORMANCE MEASURES

1.1 OVERVIEW

This Appendix's purpose is to provide a central location to display and monitor the results gathered from the annual model run.

1.2 PLAN REFERENCES

Sections of the Written Plan that reference this Appendix are as Follows:

Plan Section	Appendix Section	Table number
6.1 Overview	3.3.1 Trending 3.4.1 Trending	All tables in section All tables in section
6.5.1 Performance Metric Effectiveness Review	3.3.1 Trending 3.4.1 Trending	All tables in section All tables in section

2.0 APPENDIX REVISION SUMMARY

2.1 OVERVIEW

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table H2.1: Appendix H Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Appendix created to summaries results generated by the annual model run and to record the trending results.	Renie Sorensen & Kathleen Chirgwin
3/14/2014	Table Modification	Added column in selected tables to compare the percent change to previous year results	Renie Sorensen
3/16/2015	New Table for Baseline	Added Table H3.11 to establish which Model Run is used for the baseline for each measure.	Renie Sorensen

3.0 PERFORMANCE MEASURES

3.1 OVERVIEW

The complete performance measures are located in an Excel file on the Engineering SharePoint page and will be available from General Office Engineering upon request. Displayed here are the most recent year results, the trending baseline, and trend results. To trend CNG is using percent change from the current year and trending baseline. Percent change is calculated with the following formula

Percent Change= (Current yr-Trending Baseline)/Trending Baseline*100

Triggers for A/A Review
A performance metric will require A/A Review if the performance metric for the given year has a percent change greater than 25% of the trending baseline or increases by 15% of the trending baseline for 3 consecutive years.

3.2 REQUIRED PERFORMANCE MEASURES

These performance measures are required to be recorded and reported as part of the annual report. Trending Baseline is the average of the previous five years.

Table H3.1: WA Total/Hazardous Leaks Repaired by Cause

Leak Cause	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Corrosion	14	15	22	28	20	19.8	31	56.6%	Yes
Natural Forces	1	0	2	3	0	1.2	2	66.7%	Yes
Excavation Damage	97	107	85	97	71	91.4	97	6.1%	No
Other Outside Force Damage	15	28	11	28	3	17.0	11	-35.3%	No
Material or Weld	13	16	23	17	14	16.6	23	38.6%	Yes
Equipment	21	26	30	20	14	22.2	13	-41.4%	No
Incorrect Operations	2	1	3	0	0	1.2	6	400.0%	Yes
Other	13	4	6	8	17	9.6	30*	212.5%	Yes

*Number different from PHMSA F7100 report to maintain trending consistency until reporting criteria are clarified.

Table H3.2: OR Total/Hazardous Leaks Repaired by Cause

Leak Cause	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Corrosion	9	16	14	7	2	9.6	11	14.6%	No
Natural Forces	2	1	1	1	1	1.2	2	66.7%	Yes
Excavation Damage	30	29	30	52	21	32.4	54	66.7%	Yes
Other Outside Force Damage	8	13	11	6	5	8.6	7	-18.6%	No
Material or Weld	27	27	20	21	17	22.4	38	69.6%	Yes
Equipment	8	15	25	9	2	11.8	23	94.9%	Yes
Incorrect Operations	0	1	2	1	0	0.8	0	-100.0%	No
Other	18	2	5	21	2	9.6	3*	-68.8%	No

*Number different from PHMSA F7100 report to maintain trending consistency until reporting criteria are clarified.

Table H3.3: WA Leaks Repaired by Material

Leak Material	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Pre 1980 Steel	65	52	69	110	65	72.2	46	-36.3%	No
Post 1980 Steel	26	25	15	30	15	22.2	12	-45.9%	No
Polyethylene (PE) Plastic	86	75	67	87	68	76.6	58	-24.3%	No

Table H3.4: OR Leaks Repaired by Material

Leak Material	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Pre 1980 Steel	53	57	42	28	16	37.0	52	40.5%	Yes
Post 1980 Steel	8	18	18	15	8	12.4	11	-11.3%	No
Polyethylene (PE) Plastic	66	44	30	44	25	40.8	49	20.1%	No

Table H3.5: WA Excavation Metrics

Metric	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Number of Excavation Damages	123	108	127	157	139	130.8	164	25.4%	Yes
Number of Locate Tickets	30441	38267	41953	41958	40778	38679.4	43750	13.1%	N/A
Damages/1000 Locate Tickets	4.04	2.82	3.03	3.74	3.41	3.4	3.75	10.0%	No

Table H3.6: OR Excavation Metrics

Metric	Previous years Values					5 year Mean (2009-2013)	Current year (2014)	% change	A/A Review Needed(Y/N)
	2009	2010	2011	2012	2013				
Number of Excavation Damages	75	49	40	50	85	59.8	91	52.2%	Yes
Number of Locate Tickets	9692	9268	11144	12463	14461	11405.6	15329	34.4%	N/A
Damages/1000 Locate Tickets	7.74	5.29	3.59	4.01	5.88	5.3	5.94	12.0%	No

3.3 ADDITIONAL PERFORMANCE MEASURES

The following performance measures are in addition to the required measures and were selected to evaluate the effectiveness of the Plan. Trending Baseline is the risk values established from the Model Runs in Table H3.11.

Table H3.7: WA Additional Measures Mains Risk/1000 Ft

Metric	Base Line Value	Current year(2014)	% change Base Line	% Change Previous Year	A/A Review Needed(Y/N)
Total Risk Mains	15563.57	16173.646	3.9%	3.9%	No
Corrosion Risk	2971.071	3177.271	6.9%	0.3%	No
Natural Forces Risk	1207.041	1329.600	10.2%	7.0%	No
Excavation Damage Risk	4270.715	6408.231	50.1%	14.5%	Yes
Other Outside Force Damage Risk	221.461	219.516	-0.9%	4.4%	No
Material Risk	5.938	8.540	43.8%	1.3%	Yes
Joint Risk	1344.243	1626.675	21.0%	5.4%	No
Equipment Risk	20.105	21.473	6.8%	5.1%	No
Incorrect Operations Risk	0.286	0.353	23.4%	6.6%	No
Other Risk	1.649	0.942	-42.9%	13.4%	No
Risk for Missing/Unknown Data	3772.297	3381.045	-10.4%	-10.4%	No

Table H3.8: OR Additional Measures Mains Risk/1000 Ft

Metric	Base Line Value	Current year(2014)	% change Base Line	% Change Previous Year	A/A Review Needed(Y/N)
Total Risk Mains	10916.41	13712.040	25.6%	25.6%	Yes
Corrosion Risk	1836.646	2023.398	10.2%	1.9%	No
Natural Forces Risk	637.507	692.714	8.7%	0.5%	No
Excavation Damage Risk	4315.022	7274.650	68.6%	57.9%	Yes
Other Outside Force Damage Risk	170.891	197.812	15.8%	1.0%	No
Material Risk	15.163	20.290	33.8%	16.3%	Yes
Joint Risk	999.565	1137.198	13.8%	1.8%	No
Equipment Risk	12.694	23.490	85.1%	24.4%	Yes
Incorrect Operations Risk	0.000	0.000	#DIV/0!	#DIV/0!	No
Other Risk	4.392	0.964	-78.0%	55.2%	No
Risk for Missing/Unknown Data	2286.532	2341.523	2.4%	2.4%	No

Table H3.9: WA Additional Measures Services Risk/1000 Ft

Metric	Base Line Value	Current year(2014)	% change Base Line	% Change Previous Year	A/A Review Needed(Y/N)
Total Risk Services	8626.426	10419.816	20.8%	20.8%	No
Corrosion Risk	3805.368	2201.867	-42.1%	6.3%	No
Natural Forces Risk	1913.233	1058.296	-44.7%	8.3%	No
Excavation Damage Risk	5835.577	4897.401	-16.1%	44.0%	No
Other Outside Force Damage Risk	132.103	110.907	-16.0%	5.4%	No
Material Risk	8.117	0.778	-90.4%	46.5%	No
Joint Risk	2057.588	1255.007	-39.0%	3.8%	No
Equipment Risk	62.654	33.270	-46.9%	6.1%	No
Incorrect Operations Risk	0.768	0.778	1.4%	46.5%	No
Other Risk	4.346	2.485	-42.8%	4.3%	No
Risk for Missing/Unknown Data	828.526	859.025	3.7%	3.7%	No

Table H3.10: OR Additional Measures Services Risk/1000 Ft

Metric	Base Line Value	Current year(2014)	% change Base Line	% Change Previous Year	A/A Review Needed(Y/N)
Total Risk Services	7200.086	8772.826	21.8%	21.8%	No
Corrosion Risk	1677.549	868.361	-48.2%	2.0%	No
Natural Forces Risk	1328.413	600.321	-54.8%	0.2%	No
Excavation Damage Risk	6955.209	5417.012	-22.1%	40.0%	No
Other Outside Force Damage Risk	119.537	69.635	-41.7%	4.5%	No
Material Risk	0.000	0.093	#DIV/0!	9.4%	No
Joint Risk	1553.854	819.721	-47.2%	1.7%	No
Equipment Risk	47.613	25.110	-47.3%	13.5%	No
Incorrect Operations Risk	0.000	0.093	#DIV/0!	9.4%	No
Other Risk	8.562	2.384	-72.2%	45.5%	No
Risk for Missing/Unknown Data	982.658	970.097	-1.3%	-1.3%	No

Table H3.11: Additional Measures Baseline

Metric	Baseline Model	Comment/Reason for change
Total Risk Services	March 2014	Due to increase from Missing Values
Corrosion Risk	August 2011	Original Baseline Run
Natural Forces Risk	August 2011	Original Baseline Run
Excavation Damage Risk	August 2011	Original Baseline Run
Other Outside Force Damage Risk	August 2011	Original Baseline Run
Material Risk	August 2011	Original Baseline Run
Joint Risk	August 2011	Original Baseline Run
Equipment Risk	August 2011	Original Baseline Run
Incorrect Operations Risk	August 2011	Original Baseline Run
Other Risk	August 2011	Original Baseline Run
Risk for Missing/ Unknown Data	March 2014	Modified inputs to which increased the output requiring new baseline.

3.4 OTHER PERFORMANCE MEASURES

Performance measures that are specific to an accelerated action that are only collected while that accelerated action is active will be stored in Appendix F – *Accelerated Action*.

3.5 A/A PERFORMANCE MEASURE REVIEW SUMMARY

Below is a summary of performance metrics with increasing risk that require A/A review. A/A review shall be completed by June 15.

State	Performance Measure Description	Review Completed By	Review Completion Date	Summary of Review
WA	Excavation – Main	Renie Sorensen	3/20/2015	Continue Current WA EA A/A
WA	Material – Main	Kathleen Chirgwin		Review Material leaks and make sure they meet F7100 definitions for material or weld failure and not corrosion.
OR	Total Risk – Main	Kathleen Chirgwin	3/25/2015	Total risk on main is higher since excavation risk increased in OR. Excavation risk is 53% of total risk. The excavation risk AA should combat this.
OR	Excavation - Main	Kathleen Chirgwin	3/25/2015	Implement AA for OR Excavation Risk
OR	Material – Main	Kathleen Chirgwin		Review Material leaks and make sure they meet F7100 definitions for material or weld failure and not corrosion.
OR	Equipment - Main	Kathleen Chirgwin		Review equipment leaks and reclassify to meet F7100 definitions.
WA	Leaks- COR	Kathleen Chirgwin		Review WA Corrosion leaks and make sure they meet F7100 definitions on corrosion leaks (some could be excavation damage leaks from previous damage.)
WA	Leaks- NF	Kathleen Chirgwin	3/25/2015	No review needed, the average is very low. 2 Is not increasing risk.
WA	Leaks- MAT	Kathleen Chirgwin		Review Material leaks and make sure they meet F7100 definitions for material or weld failure and not corrosion.
WA	Leaks- Incorrect Operations	Kathleen Chirgwin		Review incorrect operations leaks and make sure these leaks meet F7100 definitions.
WA	Leaks- OTH	Kathleen Chirgwin		Review other leaks and reclassify to meet F7100 definitions.
OR	Leaks- NF	Kathleen Chirgwin	3/25/2015	No review needed, the average is very low. 2 Is not increasing risk.
OR	Leaks- EX	Kathleen Chirgwin		Review other leaks and reclassify to meet F7100 definitions.
OR	Leaks- MAT	Kathleen		Review Material leaks and make sure they meet

		Chirgwin		F7100 definitions for material or weld failure and not corrosion.
OR	Leaks- EQ	Kathleen Chirgwin		Review equipment leaks and reclassify to meet F7100 definitions.
WA	# of EX Damages	Renie Sorensen	3/20/2015	Continue Current WA EX A/A
OR	# of EX Damages	Kathleen Chirgwin	3/25/2015	Implement AA for OR Excavation Risk
OR	Pre 1980 Steel Leaks	Kathleen Chirgwin		Check the five year trending numbers, 2012 and 2013 seems low. This may be due to all the monitored leaks that were repaired by the Bend district.
WA	Total Number of Excavation Damages	Kathleen Chirgwin	3/25/2015	Continue Current WA EA A/A
OR	Total Number of Excavation Damages	Kathleen Chirgwin	3/25/2015	Implement AA for OR Excavation Risk

APPENDIX I
PERIODIC EVALUATION

Appendix I – Periodic Evaluation

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1.0 SUMMARY OF PERIODIC EVALUATION

1.1 Overview

The purpose of this appendix is to store all DIMP Review Summary forms. It also provides a location to document any changes in the model calculations found in Appendix D – *Risk Evaluation and Ranking*

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as follows:

Plan Section	Appendix Section	Table number
4.2.2 Determining Risk Weighting Factors	3.0 risk Model Revisions	I3.1
4.4 Risk Model Validation	3.0 risk Model Revisions	I3.1
7.1 Review of Written Plan	4.0 Plan Review Summary	N/A

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table I2.1: Appendix I Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Created appendix to summaries changes to the written plan and Model.	Renie Sorensen & Kathleen Chirgwin
7/15/2013	Revision 2 doc	Added documentation for 2nd revision	Renie Sorensen

3.0 RISK MODEL REVISIONS

3.1 Overview

All revisions to the risk model and/or model calculations will be summarized in this section to provide a history of how the model has changed and improved over time. Previous versions of model calculations can be found in the yearly editions of the plan.

Table I3.1: Model Revision Summary

Effective Date of Change	Reason for Change	Summary of Changes
2/14/2013	Model Overhaul after DIMP Audit	Change scoring to 0 to 10 with one decimal point. Updated sub-threats to correct threat category. Added additional sub-threats to: Corrosion, Equipment failure, Excavation Damage, and Consequence.

4.0 PLAN REVIEW SUMMARY

4.1 Overview

The following section is for the storage of all DIMP Review Summary forms and any additional revision control information to support the summary form.

Cascade Natural Gas Corporation
Intermountain Gas Company

Great Plains Natural Gas Co.
Montana-Dakota Utilities Co.

DIMP REVIEW SUMMARY

21761(7-11)

Date Started: July 3, 2013
Review Completion Date: July 5, 2013
Review Completed By: DARYL ANDERSON (MDU)

Reason/s for Program review:

Reviewed Plan for changes to Corporate decision not to proceed to new Integrated Standards and Procedures
Along with new standards numbering system.

Changes to the Written Plan required? ☒Yes ☐No **If Yes, complete the Change Summary Table and approval is required**

Changes to Risk Model required? ☐Yes ☒No **If Yes, include a summary of recommended changes and approval is required**

Summary of recommended changes:

Change Plan to reflect Standards Procedure Numbering remaining generic to each company

Written Plan: Change Summary

Plan Section	Reason For Change	From	To
Title Page	Remove reference to Integrated Procedure Numbers	Removed Numbers	No Numbers

New Plan Revision Number Required? ☒Yes ☐No **If Yes, Revision number to be updated:** Revison 2

VP –Operations (CNG): _____ Date: 7/11/13

VP – Operations (IGC): _____ Date: 7/11/2013

VP – Operations (MDU): _____ Date: 7/8/2013

Changes Implemented By: _____ **Date Implemented:** _____

Cascade Natural Gas Corporation
Intermountain Gas Company

Great Plains Natural Gas Co.
Montana-Dakota Utilities Co.

DIMP REVIEW SUMMARY

21761(7-11)

Date Started: 8/24/2012
Review Completion Date: 3/15/2013
Review Completed By: TYLER MUZZANA, KATHLEEN CHIRGWIN, RENIE SORENSEN

Reason/s for Program review: Respond to Idaho, Washington and Oregon DIMP audits conducted August 21-22 2012. Copies of the audit results are available from CNGC and IGC Engineering. Revisions to the written plan and risk model were required to be implemented prior to March 31, 2013. The new version of the DIMP written plan and related appendices will be on the Integration SharePoint Site and will be available from GO engineering.

Changes to the Written Plan required? X YES NO **If Yes, complete the Change Summary Table and approval is required**

Changes to Risk Model required? X YES NO **If Yes, include a summary of recommended changes and approval is required**

Summary of recommended changes: The most significant changes to the plan included the creation of multiple appendices that each operating company will retain and update. The appendices will have more detailed information specific to each company in order to better address DIMP requirements. Other written plan additions included more detail with regards to Subject Matter Experts and how they will be used during DIMP processes. A more detailed description of changes is listed in the attached spreadsheet. A "tracked changes" version of the original document is on the Operations Integration SharePoint (DIMP) page for reference.

Written Plan: Change Summary

Plan Section	Reason For Change	From	To
	See attached spreadsheet -		

New Plan Revision Number Required? X YES NO **If Yes, Revision number to be updated:** 1

VP –Operations (CNGC): _____ **Date:** 3/19/13
VP –Operations (IGC): _____ **Date:** 3/18/13
VP – Operations (MDU/GPNG): _____ **Date:** 3/19/13

Changes Implemented By: Kathleen Chirgwin **Date to be Implemented:** March 31, 2013

Tyler Muzzana

Renie Sorensen

Written Plan: Revision 1

Change Summary

Section	Paragraph	Description of changes.
1.5	Plan Appendices	Added section to describe how Appendices will be used to capture company specific data
1.6	SME Involvement	Added section to describe how SMEs will be used in the plan
1.6.1/1.6.2	Isolated/Panel SMEs	Added sections to describe the use of isolated SMEs vs. the SME Panel
1.7	Definitions	Added SME definition
1.8.1.5	Figure 1.3	Change CNGC org structure, Northwestern Region was combined with Western Region
2.1	Overview	Reworded to section to detail how knowledge of distribution system is demonstrated. Appendix B information added
2.2	Physical Infrastructure	Added verbiage to describe section, added more characteristics to sub sections: Steel Grade, Seam Type, Environmental characteristics, Surface Conditions, etc.
2.3	Historical Information	Added verbiage to describe section, added more examples of data used
2.4	Outside Source Data	Added verbiage and changed appendix where information is retained
2.5	Newly Installed Facilities	Moved location in plan, added verbiage to describe section and define minimum storage requirements
2.6	Information Evaluation	Rewrote section to describe QA/QC and continuous updating. (old 2.5.5)
2.6.1	Insufficient Data	Section rewrite addition of reference to appendix B for summarization of missing information
2.6.2	Developing Additional Information	Move section to subsection of 2.6 added additional activity to gather information
2.7	SME Involvement	Added section to describe how SMEs will be used in gaining knowledge of system
OLD 2.5.2.2	Tracking and Trending	Removed section described in section 6.5.1
3.1	Overview	Added verbiage to describe objective of section and added missing Data as threat category
3.2	Threats	Added or removed verbiage to threat descriptions to better reflect PHSMA leak definitions for each threat
3.2.9	Missing Data	Added description of missing data threat
3.3	Subdividing Threats	Added section to describe how sub threats are used to refine risk threat categories
3.4	Potential Threats	Added section to describe potential threats and how they are identified, stored and assessed within the distribution System. Included reference to new Appendix C
4.1	Overview	Added verbiage to describe purpose of section, referenced new Appendix D
4.2	Risk Model	Added verbiage to describe function of risk model
4.2.1	Responsibilities	Added section to describe responsible parties with respect to annual model run
4.2.2	Determination of Risk Weighting Factors	Added and removed verbiage to clarify process of developing Risk Weighting factors
4.2.3	Likelihood Factors	Changed Scale of weighting factors 0-10 added likelihood range breakdown
4.2.5	Factors for Missing Data	Added verbiage to clarify process
4.2.6	Relative Risk Calculation	Added verbiage and example to second paragraph describing how model calculates risk
4.3	Risk Ranking	Split risk ranking and model validation, Describe process for Ranking Risk
4.4	Risk Model Validation	Split risk ranking and model validation, rewrote section to describe validation process
5.1	Overview	Added verbiage to describe purpose of section
5.2.3	Maintenance Programs	Added Section to describe purpose of annual Maintenance programs
5.3	Additional or Accelerated Actions	Rewrote section to describe how and when A/As are used
5.3	Table 5.1	Updated table
5.3.1.1	A/A action implementation	Reworded section to clarify. Updated location for form storage.
5.3.2	Accelerated Action Documentation	Section added to describe documentation required with A/As

Section	Paragraph	Description of changes.
6.1	Overview	Rewrote section to describe objective of this section
6.4	Information Gathering	Added verbiage to first paragraph detailing who is responsible.
6.5	Monitoring Results	Section removed and put into sub sections 6.5.1 and 6.5.2
6.5.1	Performance Metric Effectiveness and Trending	Subsection created to add detail to trending needs and evaluation of effectiveness of Performance Measures
6.5.2	A/A Effectiveness Review and criteria	Subsection created to add detail to trending needs and evaluation of effectiveness of A/As
7.1	Review of Written Plan	Added verbiage to first paragraph detail extent of annual review. Changed storage location for review documentation
7.1.1	Review of Appendices	Added Section to describe review of Appendices
7.2	Revisions to the Written Plan	Added verbiage to describe revision process
7.2.1	Revisions to Appendices	Section added to describe how Revisions to appendices will be handled
7.3	Program improvement	Section reference update
Form 21764	SME Panel Form	Creation of SME Panel Form
Form 21761	DIMP Review Summary	Add signature line for VP- Operations CNGC
Appendices	Appendix A - K	Revised existing and added new appendices to the plan. Each appendix is specific to each operating company to allow for further detail/process information. The appendices are referenced throughout the entire document

APPENDIX J
MECHANICAL COUPLING FAILURES

Appendix J – Mechanical Coupling Failures

1.0 MECHANICAL COUPLING FAILURES

1.1 Overview

This appendix serves the purpose of recording and storing information in relation to mechanical coupling failures. The process that the gathered information goes through is established in CNG CP 722.

1.2 Plan References

Sections of the Written Plan that reference this Appendix are as follows:

Plan Section	Appendix Section	Table number
8.1 Overview	1.1 Mechanical Coupling Failure Reporting Overview	J3.1

2.0 APPENDIX REVISION SUMMARY

2.1 Overview

Revisions to this appendix will be recorded/summarized in the following table. Annual data updating does not need to be recorded here.

Table J2.1: Appendix J Revision Summary

Date of Revision	Reason For Revision	Summary of Changes	Revised By
3/15/2013	Creation	Creation of appendix to record Mechanical coupling failures for tracking purposes	Renie Sorensen & Kathleen Chirgwin

3.0 MECHANICAL COUPLING FAILURE SUMMARY

3.1 Overview

All mechanical fittings that fail are summarized in the following table to help track any issues that could create a threat to the system.

Table J3.1 Mechanical Coupling Failure Summary

Date of Failure	Location	Part Number	Root Cause of Failure
As per district managers contacted on 2/13/13 no failures have occurred for 2011 or 2012			
Per district management and Leak Review No Mechanical failures occurred that caused a hazardous leak in 2013 and 2014			

APPENDIX K
REPORTS TO GOVERNMENT AGENCIES

Appendix K – Reports to Government Agencies

1.0 REPORTS TO GOVERNMENT AGENCIES

1.1 Overview

This appendix provides a location to store PHMSA Anural Distribution Report.

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 10/31/2016

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Initial Date Submitted:	
Form Type:	INITIAL
Date Submitted:	

ANNUAL REPORT FOR CALENDAR YEAR 2014 GAS DISTRIBUTION SYSTEM

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0522. Public reporting for this collection of information is estimated to be approximately 16 hours per response, including the time for reviewing instructions, gathering the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.

PART A - OPERATOR INFORMATION

(DOT use only) -

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge
2b. City and County	Kennewick
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. GRANDRIDGE BLVD
4b. City and County	KENNEWICK
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	OR

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	SYSTEM TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED						
MILES OF MAIN		0	.69	821.99	741.15	0	0	0	28.92	1592.75
NO. OF SERVICES		0	15	29367	38635	0	0	0	183	68200

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	SYSTEM TOTALS
STEEL	0	552.90	146.21	113.	10.57	0	822.68
DUCTILE IRON	0	0	0	0	0	0	0.00
COPPER	0	0	0	0	0	0	0.00
CAST/WROUGHT IRON	0	0	0	0	0	0	0.00
PLASTIC PVC	0	0	0	0	0	0	0.00
PLASTIC PE	0	633.07	99.99	8.09	0	0	741.15
PLASTIC ABS	0	0	0	0	0	0	0.00
PLASTIC OTHER	0	0	0	0	0	0	0.00
OTHER	0	16.88	10.70	1.34	0	0	28.92
TOTAL	0.00	1,202.85	256.90	122.43	10.57	0.00	1,592.75

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR — **AVERAGE SERVICE LENGTH: 0**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	SYSTEM TOTALS
STEEL	69	28003	1268	37	4	1	29382
DUCTILE IRON	0	0	0	0	0	0	0
COPPER	0	0	0	0	0	0	0
CAST/WROUGHT IRON	0	0	0	0	0	0	0
PLASTIC PVC	0	0	0	0	0	0	0
PLASTIC PE	121	37690	792	30	2	0	38635
PLASTIC ABS	0	0	0	0	0	0	0
PLASTIC OTHER	0	0	0	0	0	0	0
OTHER	56	106	21	0	0	0	183
TOTAL	246	65799	2081	67	6	1	68200

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	171.36	.29	0	15.35	243.36	126.90	175.35	384.90	446.74	28.50	1592.75
NUMBER OF SERVICES	1189	4	8	1628	8299	5915	5340	19130	22263	4424	68200

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	6	0	5	2
NATURAL FORCES	0	0	2	1
EXCAVATION DAMAGE	12	9	42	42
OTHER OUTSIDE FORCE DAMAGE	3	3	4	2
MATERIAL OR WELDS	23	1	15	5
EQUIPMENT	14	0	9	2
INCORRECT OPERATIONS	0	0	0	0
OTHER	0	0	648	3

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 611

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 89

NUMBER OF EXCAVATION TICKETS : 14939

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 821

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 4731

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

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(Area Code and Telephone Number)

mike.eutsey@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 10/31/2016

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Initial Date Submitted:	
Form Type:	INITIAL
Date Submitted:	

ANNUAL REPORT FOR CALENDAR YEAR 2014 GAS DISTRIBUTION SYSTEM

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PART A - OPERATOR INFORMATION

(DOT use only) -

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge
2b. City and County	Kennewick
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. GRANDRIDGE BLVD
4b. City and County	KENNEWICK
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	WA

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	SYSTEM TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED						
MILES OF MAIN	0	0	3.18	2780.16	1790.49	0	0	0	131.38	4705.21
NO. OF SERVICES	0	0	87	108478	99518	0	0	0	1826	209909

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	SYSTEM TOTALS
STEEL	0	1757.	486.	424.34	57.	59.	2,783.34
DUCTILE IRON	0	0	0	0	0	0	0.00
COPPER	0	0	0	0	0	0	0.00
CAST/WROUGHT IRON	0	0	0	0	0	0	0.00
PLASTIC PVC	0	0	0	0	0	0	0.00
PLASTIC PE	0	1462.19	304.30	24.	0	0	1,790.49
PLASTIC ABS	0	0	0	0	0	0	0.00
PLASTIC OTHER	0	0	0	0	0	0	0.00
OTHER	0	97	30.38	4.	0	0	131.38
TOTAL	0.00	3,316.19	820.68	452.34	57.00	59.00	4,705.21

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 0**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	SYSTEM TOTALS
STEEL	199	104601	3596	148	17	4	108565
DUCTILE IRON	0	0	0	0	0	0	0
COPPER	0	0	0	0	0	0	0
CAST/WROUGHT IRON	0	0	0	0	0	0	0
PLASTIC PVC	0	0	0	0	0	0	0
PLASTIC PE	224	97509	1682	99	4	0	99518
PLASTIC ABS	0	0	0	0	0	0	0
PLASTIC OTHER	0	0	0	0	0	0	0
OTHER	653	1101	66	4	2	0	1826
TOTAL	1076	203211	5344	251	23	4	209909

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	678.67	.01	1.13	138.40	870.5	507.98	448.67	1071.10	834.35	154.40	4705.21
NUMBER OF SERVICES	4191	16	7	6289	30844	20014	21648	64960	49674	12266	209909

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	18	5	13	4
NATURAL FORCES	1	1	1	1
EXCAVATION DAMAGE	27	23	68	67
OTHER OUTSIDE FORCE DAMAGE	4	2	7	7
MATERIAL OR WELDS	11	1	12	0
EQUIPMENT	6	0	7	3
INCORRECT OPERATIONS	3	1	3	1
OTHER	12	1	1022	5

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 273

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 152

NUMBER OF EXCAVATION TICKETS : 41489

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 1216

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 12761

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 2

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

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(Area Code and Telephone Number)

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(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Initial Date Submitted:	03/14/2014
Form Type:	INITIAL
Date Submitted:	

ANNUAL REPORT FOR CALENDAR YEAR 2013 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

PART A - OPERATOR INFORMATION	**(DOT use only)**	**20142729-21771**
1. Name of Operator	CASCADE NATURAL GAS CORP	
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)		
2a. Street Address	8113 W. Grandridge	
2b. City and County	Kennewick	
2c. State	WA	
2d. Zip Code	99336	
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128	
4. HEADQUARTERS NAME & ADDRESS		
4a. Street Address	8113 W. GRANDRIDGE BLVD	
4b. City and County	KENNEWICK	
4c. State	WA	
4d. Zip Code	99336	
5. STATE IN WHICH SYSTEM OPERATES	OR	

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	**COATED**	**BARE**	**COATED**	**DUCTILE IRON**	**COPPER**	**CAST/ WROUGHT IRON**	**PLASTIC**	**OTHER**	**TOTAL**
MILES OF MAIN	0.000	0.000	1.000	803.000	0.000	0.000	0.000	731.000	29.000	1564.000
NO. OF SERVICES	0.000	0.000	20.000	30073.000	0.000	0.000	0.000	37711.000	331.000	68135.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.000	553.000	147.000	98.000	6.000	0.000	804.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	626.000	97.000	8.000	0.000	0.000	731.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	17.000	11.000	1.000	0.000	0.000	29.000
TOTAL	0.000	1196.000	255.000	107.000	6.000	0.000	1564.000

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 0**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	74.000	28680.000	1296.000	38.000	4.000	1.000	30093.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	132.000	36786.000	766.000	25.000	2.000	0.000	37711.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	266.000	37.000	28.000	0.000	0.000	0.000	331.000
TOTAL	472.000	65503.000	2090.000	63.000	6.000	1.000	68135.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	165.000	0.000	0.000	15.000	244.000	127.000	169.000	379.000	446.500	18.500	1564.000
NUMBER OF SERVICES	1505.000	5.000	7.000	1565.000	8173.000	5955.000	5430.000	19285.000	22710.000	3500.000	68135.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	2	1	0	0
NATURAL FORCES	0	0	1	0
EXCAVATION DAMAGE	6	6	15	15
OTHER OUTSIDE FORCE DAMAGE	1	0	4	1
MATERIAL OR WELDS	8	0	9	3
EQUIPMENT	1	0	1	0
INCORRECT OPERATIONS	0	0	0	0
OTHER	1	0	1	1

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 52

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 85

NUMBER OF EXCAVATION TICKETS : 14461

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 1128

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 3710

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,agent
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NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Initial Date Submitted:	03/14/2014
Form Type:	INITIAL
Date Submitted:	

ANNUAL REPORT FOR CALENDAR YEAR 2013 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

PART A - OPERATOR INFORMATION	**(DOT use only)**	**20142728-21770**
1. Name of Operator	CASCADE NATURAL GAS CORP	
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)		
2a. Street Address	8113 W. Grandridge	
2b. City and County	Kennewick	
2c. State	WA	
2d. Zip Code	99336	
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128	
4. HEADQUARTERS NAME & ADDRESS		
4a. Street Address	8113 W. GRANDRIDGE BLVD	
4b. City and County	KENNEWICK	
4c. State	WA	
4d. Zip Code	99336	
5. STATE IN WHICH SYSTEM OPERATES	WA	

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	**COATED**	**BARE**	**COATED**	**DUCTILE IRON**	**COPPER**	**CAST/ WROUGHT IRON**	**PLASTIC**	**OTHER**	**TOTAL**
MILES OF MAIN	0.000	0.000	4.700	2653.740	0.000	0.000	0.000	1752.810	169.560	4580.810
NO. OF SERVICES	0.000	0.000	92.000	109539.000	0.000	0.000	0.000	98832.000	2028.000	210491.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.010	1735.520	480.240	385.450	54.960	2.260	2658.440
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.070	1434.740	299.410	18.590	0.000	0.000	1752.810
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	124.610	40.290	4.660	0.000	0.000	169.560
TOTAL	0.080	3294.870	819.940	408.700	54.960	2.260	4580.810

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 0**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	207.000	105608.000	3644.000	152.000	16.000	4.000	109631.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	236.000	96864.000	1629.000	99.000	4.000	0.000	98832.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	1111.000	839.000	72.000	4.000	2.000	0.000	2028.000
TOTAL	1554.000	203311.000	5345.000	255.000	22.000	4.000	210491.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	651.280	0.100	1.130	136.920	869.990	477.440	434.800	1054.450	832.770	121.930	4580.810
NUMBER OF SERVICES	4988.000	15.000	7.000	6061.000	29998.000	20033.000	21936.000	65617.000	50888.000	10948.000	210491.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	15	3	5	0
NATURAL FORCES	0	0	0	0
EXCAVATION DAMAGE	18	9	53	27
OTHER OUTSIDE FORCE DAMAGE	0	0	1	3
MATERIAL OR WELDS	6	0	8	3
EQUIPMENT	6	1	8	2
INCORRECT OPERATIONS	0	0	0	0
OTHER	6	1	11	2

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 69

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 139

NUMBER OF EXCAVATION TICKETS : 40778

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 1810

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 11309

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,agent
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Form Type:	INITIAL
Date Submitted:	04/10/2013
(DOT use only)	20131407-18837

ANNUAL REPORT FOR CALENDAR YEAR 2012 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge
2b. City	Kennewick
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. GRANDRIDGE BLVD
4b. City	KENNEWICK
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	OR

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	DUCTILE IRON	COPPER	CAST/ WROUGHT IRON	PLASTIC	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	0.000	814.000	0.000	0.000	0.000	670.000	0.000	1484.000
NO. OF SERVICES	0	0	0	30121	0	0	0	35828	0	65949

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.000	558.000	158.000	92.000	6.000	0.000	814.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	575.000	89.000	6.000	0.000	0.000	670.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	1133.000	247.000	98.000	6.000	0.000	1484.000

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 72**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0	28770	1319	29	3	0	30121
DUCTILE IRON	0	0	0	0	0	0	0
COPPER	0	0	0	0	0	0	0
CAST/WROUGHT IRON	0	0	0	0	0	0	0
PLASTIC PVC	0	0	0	0	0	0	0
PLASTIC PE	0	35132	612	83	1	0	35828
PLASTIC ABS	0	0	0	0	0	0	0
PLASTIC OTHER	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
TOTAL	0	63902	1931	112	4	0	65949

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	0.000	0.000	0.000	62.000	320.000	134.000	168.000	367.000	424.000	9.000	1484.000
NUMBER OF SERVICES	0	0	0	0	9652	6513	5119	18378	23857	2430	65949

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	3	1	4	2
NATURAL FORCES	0	0	1	1
EXCAVATION DAMAGE	13	8	39	39
OTHER OUTSIDE FORCE DAMAGE	3	3	3	2
MATERIAL OR WELDS	7	2	14	5
EQUIPMENT	5	0	4	0
INCORRECT OPERATIONS	0	0	1	0
OTHER	4	1	17	11

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 47

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 50

NUMBER OF EXCAVATION TICKETS : 12463

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 621

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 2583

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,agent
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Form Type:**	INITIAL
	Date Submitted:	04/10/2013
	(DOT use only)	20131406-18836

ANNUAL REPORT FOR CALENDAR YEAR 2012 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge
2b. City	Kennewick
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. GRANDRIDGE BLVD
4b. City	KENNEWICK
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	WA

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	DUCTILE IRON	COPPER	CAST/ WROUGHT IRON	PLASTIC	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	0.000	2772.000	0.000	0.000	0.000	1594.000	0.000	4366.000
NO. OF SERVICES	0	0	0	114944	0	0	0	95358	0	210302

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.000	1887.000	482.000	316.000	42.000	45.000	2772.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	1315.000	265.000	14.000	0.000	0.000	1594.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	3202.000	747.000	330.000	42.000	45.000	4366.000

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 75**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0	111094	3679	159	12	0	114944
DUCTILE IRON	0	0	0	0	0	0	0
COPPER	0	0	0	0	0	0	0
CAST/WROUGHT IRON	0	0	0	0	0	0	0
PLASTIC PVC	0	0	0	0	0	0	0
PLASTIC PE	0	94640	693	25	0	0	95358
PLASTIC ABS	0	0	0	0	0	0	0
PLASTIC OTHER	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
TOTAL	0	205734	4372	184	12	0	210302

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	0.000	0.000	0.000	423.000	993.000	579.000	418.000	1040.000	827.000	86.000	4366.000
NUMBER OF SERVICES	0	0	0	1723	31955	24926	20600	61736	60158	9204	210302

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	10	0	18	3
NATURAL FORCES	1	0	2	1
EXCAVATION DAMAGE	22	11	75	37
OTHER OUTSIDE FORCE DAMAGE	3	0	25	14
MATERIAL OR WELDS	7	1	10	0
EQUIPMENT	3	0	17	1
INCORRECT OPERATIONS	0	0	0	0
OTHER	3	1	5	0

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 92

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 157

NUMBER OF EXCAVATION TICKETS : 41958

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 1639

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 9062

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: 0%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,agent
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0522 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Form Type:**	INITIAL
	ID:	11746
	(DOT use only)	20120666-15717

ANNUAL REPORT FOR CALENDAR YEAR 2011 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge Blvd
2b. City and County	Kennewick,Benton
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. Grandridge Blvd
4b. City and County	Kennewick,Benton
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	OR

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	0.000	814.980	667.250	0.000	0.000	0.000	0.000	1482.230
N0. OF SERVICES	0.000	0.000	0.000	30243.000	35353.000	0.000	0.000	0.000	0.000	65596.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.000	558.580	158.350	92.010	6.040	0.000	814.980
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	573.730	88.190	5.330	0.000	0.000	667.250
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	1132.310	246.540	97.340	6.040	0.000	1482.230

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH: 72

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0.000	28884.000	1327.000	29.000	3.000	0.000	30243.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	34670.000	600.000	83.000	0.000	0.000	35353.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	63554.000	1927.000	112.000	3.000	0.000	65596.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	0.000	0.000	0.000	62.410	320.520	134.110	168.120	367.440	423.560	6.070	1482.230
NUMBER OF SERVICES	0.000	0.000	0.000	0.000	9765.000	6520.000	5125.000	18388.000	23857.000	1941.000	65596.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	0	0	3	0
NATURAL FORCES	0	0	0	0
EXCAVATION DAMAGE	7	0	13	0
OTHER OUTSIDE FORCE DAMAGE	0	0	3	0
MATERIAL OR WELDS	6	0	12	0
EQUIPMENT	2	0	1	0
INCORRECT OPERATIONS	0	0	39	0
OTHER	15	0	26	0

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 8

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 65

NUMBER OF EXCAVATION TICKETS : 11144

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 571

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 2547

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: .34%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,Manager of Standards and Compl
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.

OMB NO: 2137-0522
EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Form Type:	INITIAL
ID:	11642
(DOT use only)	20120667-15718

ANNUAL REPORT FOR CALENDAR YEAR 2011 GAS DISTRIBUTION SYSTEM

PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge Blvd.
2b. City and County	Kennewick,Benton
2c. State	WA
2d. Zip Code	99336-7166
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. Grandridge Blvd
4b. City and County	Kennewick,Benton
4c. State	WA
4d. Zip Code	99336-7166
5. STATE IN WHICH SYSTEM OPERATES	WA

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	9.000	2774.530	1574.800	0.000	0.000	0.000	0.000	4358.330
NO. OF SERVICES	0.000	0.000	0.000	115553.000	90298.000	0.000	0.000	0.000	0.000	205851.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	9.000	1886.350	482.840	317.320	43.400	44.620	2783.530
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	1301.580	259.900	13.320	0.000	0.000	1574.800
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	9.000	3187.930	742.740	330.640	43.400	44.620	4358.330

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR — **AVERAGE SERVICE LENGTH: 75**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0.000	111559.000	3693.000	289.000	12.000	0.000	115553.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	89647.000	626.000	25.000	0.000	0.000	90298.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	201206.000	4319.000	314.000	12.000	0.000	205851.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	9.000	0.000	0.000	424.300	998.230	578.710	418.640	1040.430	827.490	61.530	4358.330
NUMBER OF SERVICES	0.000	0.000	0.000	1729.000	32412.000	24944.000	19747.000	61307.000	60162.000	5550.000	205851.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	2	0	6	0
NATURAL FORCES	0	0	0	0
EXCAVATION DAMAGE	14	0	24	0
OTHER OUTSIDE FORCE DAMAGE	0	0	8	0
MATERIAL OR WELDS	6	0	6	0
EQUIPMENT	0	0	2	0
INCORRECT OPERATIONS	0	0	0	0
OTHER	14	0	18	0

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 65

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 161

NUMBER OF EXCAVATION TICKETS : 41953

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 750

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 6922

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: .06%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,Manager of Standards and Compl
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.

OMB NO: 2137-0522
EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Form Type:	ORIGINAL
ID:	3615
(DOT use only)	20111195-16297

ANNUAL REPORT FOR CALENDAR YEAR 2010 GAS DISTRIBUTION SYSTEM

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0522. Public reporting for this collection of information is estimated to be approximately 16 hours per response, including the time for reviewing instructions, gathering the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.

PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge Blvd
2b. City and County	Kennewick,Benton
2c. State	WA
2d. Zip Code	99336
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. Grandridge Blvd
4b. City and County	Kennewick,Benton
4c. State	WA
4d. Zip Code	99336
5. STATE IN WHICH SYSTEM OPERATES	OR

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	0.000	823.510	665.210	0.000	0.000	0.000	0.000	1488.720
NO. OF SERVICES	0.000	0.000	0.000	30337.000	34215.000	0.000	0.000	0.000	0.000	64552.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.000	558.580	158.440	106.490	0.000	0.000	823.510
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	571.870	88.010	5.330	0.000	0.000	665.210
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	1130.450	246.450	111.820	0.000	0.000	1488.720

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 72**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0.000	28968.000	1337.000	29.000	3.000	0.000	30337.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	33618.000	576.000	21.000	0.000	0.000	34215.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	62586.000	1913.000	50.000	3.000	0.000	64552.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	0.000	0.000	0.000	62.430	320.750	134.110	183.200	372.580	412.620	3.020	1488.720
NUMBER OF SERVICES	0.000	0.000	0.000	0.000	9849.000	6527.000	5130.000	16395.000	23857.000	794.000	64552.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	5		12	
NATURAL FORCES	0		1	
EXCAVATION DAMAGE	8		17	
OTHER OUTSIDE FORCE DAMAGE	0		8	
MATERIAL OR WELDS	24		21	
EQUIPMENT	0		0	
INCORRECT OPERATIONS	0		0	
OTHER	2		3	

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 5

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 49

NUMBER OF EXCAVATION TICKETS : 9268

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 776

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 1976

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: .34%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,Manager of Standards and Comp
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(509) 737-9803
(Area Code and Facsimile Number)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed 100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.

OMB NO: 2137-0522
EXPIRATION DATE: 01/31/2014

U.S Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Form Type:	ORIGINAL
ID:	3572
(DOT use only)	20111180-16296

ANNUAL REPORT FOR CALENDAR YEAR 2010 GAS DISTRIBUTION SYSTEM

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PART A - OPERATOR INFORMATION

1. Name of Operator	CASCADE NATURAL GAS CORP
2. LOCATION OF OFFICE (WHERE ADDITIONAL INFORMATION MAY BE OBTAINED)	
2a. Street Address	8113 W. Grandridge Blvd.
2b. City and County	Kennewick,Benton
2c. State	WA
2d. Zip Code	99336-7166
3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER	2128
4. HEADQUARTERS NAME & ADDRESS	
4a. Street Address	8113 W. Grandridge Blvd
4b. City and County	Kennewick,Benton
4c. State	WA
4d. Zip Code	99336-7166
5. STATE IN WHICH SYSTEM OPERATES	WA

PART B - SYSTEM DESCRIPTION

1.GENERAL

	STEEL									
	UNPROTECTED		CATHODICALLY PROTECTED							
	BARE	COATED	BARE	COATED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
MILES OF MAIN	0.000	0.000	9.000	2743.690	1547.960	0.000	0.000	0.000	0.000	4300.650
NO. OF SERVICES	0.000	0.000	0.000	115798.000	89090.000	0.000	0.000	0.000	0.000	204888.000

2.MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	9.000	1887.120	469.670	300.160	42.120	44.620	2752.690
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	1278.080	256.560	13.320	0.000	0.000	1547.960
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	9.000	3165.200	726.230	313.480	42.120	44.620	4300.650

3.NUMBER OF SERVICES IN SYSTEM AT END OF YEAR | **AVERAGE SERVICE LENGTH: 75**

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL	0.000	111903.000	3721.000	162.000	12.000	0.000	115798.000
DUCTILE IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAST/WROUGHT IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PVC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PLASTIC PE	0.000	88482.000	584.000	24.000	0.000	0.000	89090.000
PLASTIC ABS	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER PLASTIC	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	200385.000	4305.000	186.000	12.000	0.000	204888.000

4.MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UNKNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
MILES OF MAIN	0.000	0.000	0.000	403.000	1059.000	566.000	413.000	1024.000	828.000	7.650	4300.650
NUMBER OF SERVICES	0.000	0.000	0.000	1732.000	32744.000	24976.000	20837.000	61920.000	60169.000	2510.000	204888.000

PART C - TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING THE YEAR

CAUSE OF LEAK	MAINS		SERVICES	
	TOTAL	HAZARDOUS	TOTAL	HAZARDOUS
CORROSION	6		8	
NATURAL FORCES	0		2	
EXCAVATION DAMAGE	41		90	
OTHER OUTSIDE FORCE DAMAGE	2		10	
MATERIAL OR WELDS	11		17	
EQUIPMENT	1		1	
INCORRECT OPERATIONS	1		0	
OTHER	8		6	

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR : 43

PART D - EXCAVATION DAMAGE

NUMBER OF EXCAVATION DAMAGES: 108

NUMBER OF EXCAVATION TICKETS : 38267

PART E-EXCESS FLOW VALUE(EFV) DATA

NUMBER OF EFV'S INSTALLED THIS CALENDER YEAR ON SINGLE FAMILY RESIDENTIAL SERVICES: 2464

ESTIMATED NUMBER OF EFV'S IN SYSTEM AT THE END OF YEAR: 6172

PART F - LEAKS ON FEDERAL LAND

TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED TO REPAIR: 0

PART G-PERCENT OF UNACCOUNTED FOR GAS

UNACCOUUNTED FOR GAS AS A PERCENT OF TOTAL INPUT FOR THE 12 MONTHS ENDING JUNE 30 OF THE REPORTING YEAR.

INPUT FOR YEAR ENDING 6/30: .08%

PART H - ADDITIONAL INFORMATION

PART I - PREPARER AND AUTHORIZED SIGNATURE

Tina Beach,Manager of Standards and Compl
(Preparer's Name and Title)

(509) 734-4576
(Area Code and Telephone Number)

tina.beach@cngc.com
(Preparer's email address)

(509) 737-9803
(Area Code and Facsimile Number)

Justification Footnote	Row Labels	Blanket/Specific	2015 Approved	Jan to Jul Act	Aug-Dec Estimate	Actuals plus Estimate	Oregon Allocated Total
	AS		6,279,626	5,679,753	2,317,087	7,996,841	1,940,833
	CNG-G-Facilities - FP		0	83,434	0	83,434	20,249
	CNG- CONVERSION - CNG- CONVERSION	Overheads	0	71,330	0	71,330	17,312
5	FP-101213 - GP BUILDINGS - INTERSTATE	Blanket	0	12,104		12,104	2,938
	CNG-G-Meters/Regs/Station Eq - FP		2,024,189	1,284,818	646,958	1,931,776	468,842
1	FP-101210 - PRE-CAP MTR-GROWTH-INTERSTAT	Blanket	1,760,984	1,114,102	538,437	1,652,539	401,071
1	FP-101259 - PRE-CAP REG-GROWTH-INTERSTAT	Blanket	263,204	170,716	108,521	279,237	67,771
	CNG-G-Office Eq & Tools - FP		202,146	1,422,680	49,855	1,472,535	357,384
5	FP-101216 - GP TOOLS - INTERSTATE	Blanket	202,146	172,959	49,855	222,813	54,077
5	FP-200268 - CNGC Engineering & Supervision	Overheads	0	868,294	0	868,294	210,735
5	FP-200269 - CNGC General & Administrative	Overheads	0	381,427	0	381,427	92,572
	CNG-G-Technology - FP		3,907,616	2,792,687	1,519,658	4,312,345	1,046,606
4	FP-101164 - GP COMM EQUIP - INTERSTATE	Blanket	357,619	507,838	36,722	544,560	132,165
4	FP-101209 - INTANGIBLES - SOFTWARE	Blanket	129,262	20,561	102,587	123,148	29,888
4	FP-101510 - UG GMS PURCHASE SOFTWARE	Specific	110,086	395,234		395,234	95,923
4	FP-200028 - UG AUTO TEST CNG DIRECT	Specific	0	1,021		1,021	248
4	FP-200155 - UG GPSLS PROJECT - HARDWARE	Specific	332	194	148	342	83
4	FP-200352 - CC&B COSTS	Specific	1,622,715	1,443,446	676,131	2,119,577	514,421
4	FP-200378 - MWM PROJECT - CNGC	Specific	0	43,993		43,993	10,677
4	FP-200661 - DATA CENTER/NETWORKING EQUIP	Blanket	96,065	28,155	15,578	43,733	10,614
4	FP-200662 - PC SUPPORT EQUIPMENT	Blanket	508,451	213,218	73,924	287,142	69,689
4	FP-200663 - UG GIS ENHANCEMENTS CNG DIRECT	Specific	668,571	52,707	477,776	530,483	128,748
4	FP-300309 - REPLACE MOBILE COLLECTORS	Specific	0	4,525		4,525	1,098
4	FP-302621 - LV Customer Website	Specific	11,842	11,734		11,734	2,848
4	FP-302626 - ECM Upgrade	Specific	68,388	0	0	0	-
4	FP-306967 - District Office Access Control Sys	Specific	334,285	70,061	136,792	206,852	50,203
	CNG-G-Vehicles - FP		145,675	96,135	100,617	196,751	47,752
5	FP-101215 - GP TRAN. VEHICLE - INTERSTAT	Blanket	145,675	96,135	100,617	196,751	47,752
	OR		7,213,912	3,691,884	3,659,872	7,351,757	7,351,757
	CNG-G-Facilities - FP		43,272	93,836	0	93,836	93,836
	FP-302000 - Baker City Office Purchase	Specific	43,272	93,836		93,836	93,836
	CNG-G-Mains - FP		4,132,274	1,970,809	2,173,411	4,144,220	4,144,220
1	FP-101170 - MAIN-GROWTH-OREGON	Blanket	489,544	325,471	203,977	529,448	529,448
	FP-101171 - MAIN-REINFORCE-OREGON	Blanket	122,853	0	51,189	51,189	51,189
2	FP-101172 - MAIN-RELO-REPL-OREGON	Blanket	339,192	596,978	141,330	738,308	738,308
3	FP-200688 - BEND PIPE REPL	Specific	2,450,964	224,076	1,196,904	1,420,981	1,420,981
	FP-300340 - MN, HERMISTON	Specific	0	9,070	12,028	21,098	21,098
	FP-302370 - GB - GROUNDBED OREGON	Blanket	426,546	136,977	307,051	444,028	444,028
	FP-306080 - RF 6" PE MN NW 5TH PRINEVILLE	Specific	0	290,541		290,541	290,541
	FP-306563 - REL/RE N RIM REPLACEMENT REDMOND	Specific	0	0	0	0	0
	FP-307001 v-29 Pendleton Replacement	Specific	0	0	101,000	101,000	101,000
	FP-307026 - ONTARIO 6" IP REPLACEMENT	Specific	303,175	180,383	0	180,383	180,383
	FP-309640 - 4in Stanton Blvd Reinforcement	Specific	0	78,509		78,509	78,509
2	FP-309940 - 4" STL RELOCATION MADRAS ODOT PROJE	Specific	0	213,143	0	213,143	213,143
2	FP-310660 - REL 2" STL MAIN S HWY 97 MADRAS	Specific	0	4,265	42,758	47,023	47,023
1	FP-310880 - MN EXT TO SERVE NEW DEER RIDGE SUB.	Specific	0	-88,505	117,174	28,569	28,569
	CNG-G-Meters/Regs/Station Eq - FP		758,680	179,877	484,891	664,769	664,769
1	FP-101173 - R STA-GROWTH-OREGON	Blanket	108,253	1,257	36,084	37,342	37,342
2	FP-101175 - R STA-RELO-REPL-OREGON	Blanket	122,687	112,992	51,119	164,111	164,111
1	FP-101178 - STD M&R-GROWTH-OREGON	Blanket	0	42,596	0	42,596	42,596
2	FP-101179 - STD M&R-RELO-REPL-OREGON	Blanket	0	4,099	0	4,099	4,099
1	FP-101180 - IND M&R-GROWTH-OREGON	Blanket	98,197	12,956	39,279	52,235	52,235
	FP-101181 - IND M&R-REMOVE&REPLACE-OREGON	Blanket	49,315	5,977	20,548	26,525	26,525
	FP-302650 - O-4 UMATILLA	Specific	206,223	0	187,289	187,289	187,289
	FP-309300 - REPLACE O-3 HERMISTON	Specific	174,005	0	150,572	150,572	150,572
	CNG-G-Office Eq & Tools & Buildings - FP		135,551	109,161	0	109,161	109,161
5	FP-101218 - GP TOOLS - BEND	Blanket	49,763	61,901	0	61,901	61,901
5	FP-101237 - GP TOOLS - PENDLETON	Blanket	17,309	22,282		22,282	22,282
5	FP-101234 - GP BUILDINGS - PENDLETON	Blanket	38,945	0		0	0
5	FP-101255 - GP TOOLS - ONTARIO	Blanket	29,533	24,978		24,978	24,978
	CNG-G-Services - FP		1,146,321	918,622	477,634	1,396,256	1,396,256
1	FP-101176 - SERV-GROWTH-OREGON	Blanket	1,146,321	800,849	477,634	1,278,483	1,278,483
2	FP-101177 - SERV-RELO-REPL-OREGON	Blanket	0	117,773	0	117,773	117,773
	CNG-G-Vehicles - FP		997,814	419,578	523,937	943,515	943,515
5	FP-101184 - GP TRAN. VEHICLE - OREGON	Blanket	709,846	435,509	295,769	731,278	731,278
5	FP-101186 - GP POWER EQUIP - OREGON	Blanket	287,968	-15,931	228,168	212,237	212,237
	Grand Total		13,493,538	9,371,638	5,976,960	15,348,598	9,292,590
						9,292,590	

	2015 Approved	Actuals	Estimate Aug - Dec	2015 T&S Proforma
Oregon Allocation of costs-all completion/in service dates	12,040,920	5,146,285	4,554,684	9,700,969
Projects in service/estimated in-Service 2015	8,737,977	5,070,361	4,222,230	9,292,590

			Percent of total Investment
1	These totals are blanket work orders associated with adding new customers Revenue from new customers is included in the 2015 Revenue Adjustment	2,437,515	26%
2	These are relocate projects driven by cities etc that require Cascade to move facilities under its franchise agreement	1,284,458	14%
3	Bend Project	1,420,981	15%
4	Information Technology project justified and agreed by Staff to be recoverable	1,046,606	11%
	Total supported projects (Sum of footnotes 1, 2, 3, and 4)	6,189,559.14	67%
5	Blanket projects for vehicles, tools, etc. (Will be actual cost by end of year)	1,478,061.43	16%

	Remaining Projects		
	FP-302000 - Baker City Office Purchase	93,836	
	FP-101171 - MAIN-REINFORCE-OREGON	51,189	
	FP-300340 - MN, HERMISTON	21,098	
	FP-302370 - GB - GROUNDBED OREGON	444,028	
x	FP-306080 - RF 6" PE MN NW 5TH PRINEVILLE	290,541	
x	FP-306563 - REL/RE N RIM REPLACEMENT REDMOND	0	
x	FP-307001 v-29 Pendleton Replacement	101,000	
x	FP-307026 - ONTARIO 6" IP REPLACEMENT	180,383	
x	FP-309640 - 4in Stanton Blvd Reinforcement	78,509	
	FP-101181 - IND M&R-REMOVE&REPLACE-OREGON	26,525	
x	FP-302650 - O-4 UMATILLA	187,289	
x	FP-309300 - REPLACE O-3 HERMISTON	150,572	
Total		1,624,970	17%
		9,292,590.12	100%

FP #	Description	Amount	Justification for Project
FP-307001	V-29 PENDLETON REPLACEMENT	$101,000	The current vault this failing and crumbling away. We plan on removing the vault and inserting a new valve run that will be compatible with underground service. This project will result in the a new underground valve with valve box and a high head extension.
FP-309300	REPLACE O-3 HERMISTON	$150,572	This project will result in the replacement of the below ground odorizer and odorant storage tank, whose integrity is threatened by severe corrosion. The new odorizer and tank will be above ground and will be easily monitored and maintained.
FP-302650	O-4 UMATILLA	$187,289	The current odorizer is inefficient and outdated. Additionally, there is a general lack of tank capacity. Therefore requiring field personnel to manually transfer odorant from the storage tank to the operating tank. This new odorizer will be more efficient and have sufficient storage capacity.

FP-307026	ONTARIO 6" IP REPLACEMENT	180,383	This focus of this project was to eliminate a stretch of pipe that had numerous leaks in a neighborhood alley.
FP-309640	4in Stanton Blvd Reinforcement	78,509	This project was growth related and was needed for a customers added load (CLS).
FP-306080	RF 6" PE MN NW 5TH PRINEVILLE	290,541	Was a reinforcement to support a new school and hospital. So the reason behind is Growth.
FP-306563	REL/RE N RIM REPLACEMENT REDMOND	0	This project was canceled due to city changing plans. Therefore, no cost is shown.
FP-101171	MAIN-REINFORCE-OREGON	51,189	Blanket Project for various main reiforcements throughout Oregon. These projects are typically driven by additional growth
FP-300340	MN, HERMISTON	21,098	Small main replacement project.
FP-101181	IND M&R-REMOVE&REPLACE-OREGON	26,525	Blanket project for various meter and regulator replacements both scheduled and unscheduled.
FP-302370	GB - GROUNDBED OREGON	444,028	Blanket project to perform cothodic protection of various sections of pipe as they become known throughout the year. This is a pure safety measure as pipe conditions become known.

Cascade Natural Gas
Summary of New Positions for 2015 - 2nd pass

Union	Utility B	2
Union	Service Mechanics	3
Union	Metering Electronics Inspector	1
	OD Specialist	1
	Operations Aide	2
	Procurment Supervisor	1
	Engineer Associate	1
	Supply Resource Analyist	1
	Technical Training Coordinator	1
	Admin Assist (Train & Safety)	1
		14 new positions for 2015

Positions in 2015 budgeted for Retiring employee's with significant overlap time for training (one time budget expense)

Union	Service Mechanic (overlap Position)	1
	HR Manager Overlap Position	1
		2

Region/Department	Position	Hiring Director/Mngr	Hourly pay	Annual pay	O&M	Capital
Southern Region	Utility B	Jeff Staudenmaier	22.07	$ 45,900	$ 30,753	$ 15,147
	Utility B	Jeff Staudenmaier	22.07	$ 45,900	$ 30,753	$ 15,147
	Engineering Associate	Jeff Staudenmaier	31.27	$ 65,000	$ 13,000	$ 52,000
	Service Mechanic B	Jeff Staudenmaier	30.90	$ 64,300	$ 62,371	$ 1,929
	Service Mechanic B	Jeff Staudenmaier	30.90	$ 64,300	$ 62,371	$ 1,929
	Operations Aide	Jeff Staudenmaier	17.00	$ 35,400	$ 30,090	$ 5,310
620: Training	Technical Training Coordinator	Brion Beaver	36.06	$ 75,000	$ - 75,000	$ -
Northwest Region	Metering/Electronic Inspector	Tiffany Urland	36.00	$ 74,880	$ 68,141	$ 6,739
	Operations Aide	Kathy Bergner	24.34	$ 50,600	$ 43,010	$ 7,590
	Service Mechanic B (replacement)	Kyle Fritz	30.90	$ 64,300	$ 62,371	$ 1,929
611: Gas Supply Resource Planning	Supply Resource Analyst	Mark Sellers-Vaughn	31.44	$ 65,400	$ - 65,400	$ -
617: Human Resources	OD Specialist	Bob Harris	29.13	$ 60,600	$ 60,600	$ -
	Mgr. Human Resources (replacement)	Bob Harris	51.01	$ 106,100	$ 106,100	$ -
Central Region	Service Mechanic B	Esparza/Youngblood	30.90	$ 64,300	$ 62,371	$ 1,929
631: Safety	Safety & Training Admin Assist	Brion Beaver	24.03	$ 50,000	$ 50,000	$ -
638: Central Stores	Procurment Supervisor	Joe Silveira	25.00	$ 52,000	$ 13,000	$ 39,000
			total payroll	$ 983,980	$ 835,331	$ 148,649

Regulatory Analyst

82,500

below are the positions that were cut/modifed

Dept	Position	Manager	Hourly pay	Annual pay
620: Training	Technical Training Coordinator	Brion Beaver	$ 36.06	$ 75,000
620: Training	Admin Assistant	Brion Beaver		$ -

Position moved from Dept: 620 t o Dept: 631

* should have include these two positions

2015 Positions added for Oregon Operations

Region/Department	Annual Wage	Expense Level	Oregon Allocation
Southern Region:			
Utility B	45,900	30,753	
Utility B	45,900	30,753	
Engineering Associate	65,000	13,000	
Service Mechanic B	64,300	62,371	
Operations Aide	35,400	30,090	166,967
Procurement Specialist	52,000	13,000	
Gas Supply Resource Analyst	65,400	65,400	
Regulatory Analyst	82,500	82,500	
Total		160,900	
Oregon Allocation		24.30%	
			39,099
Total Oregon new Positions			206,066
Labor Loading		45%	
Total Increase for added Positions			457,924

CNGC CUSTOMER & EMPLOYEE COUNT BY REGION/DISTRICT/OPERATING CENTER

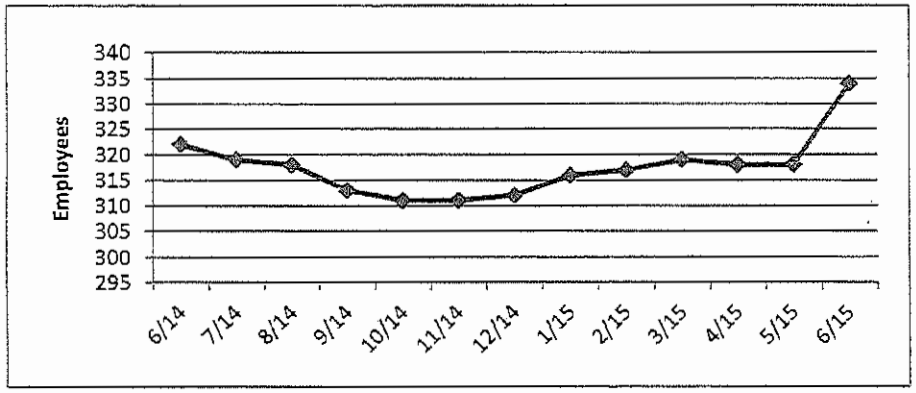
06/30/15

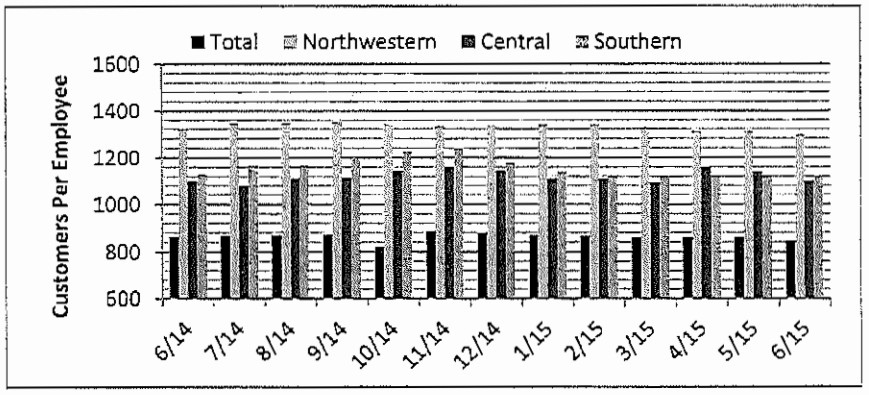
			EMPLOYEE COUNTS				CUSTOMERS PER REG/PT EMP
REGIONS	GAS	TOTAL	REGULAR	PART TIME	TEMPORARY	TOTAL	COUNT
Northwest Region	131,175	**131,175**	101	0	6	**107**	1299
Central Region	72,690	**72,690**	66	0	4	**70**	1101
Southern Region	68,384	**68,384**	61	0	3	**64**	1121
TOTAL	***272,249***	***272,249***	***228***	***0***	***13***	***241***	***1194***

DISTRICTS	GAS	TOTAL	REGULAR	PART TIME	TEMPORARY	TOTAL	COUNT
Bellingham	47,346	**47,346**	29	0	3	**32**	1633
Bremerton	31,922	**31,922**	22	0	0	**22**	1451
Aberdeen	6,225	**6,225**	11	0	0	**11**	566
Longview	3,867	**3,867**	11	0	0	**11**	352
Mt Vernon	41,815	**41,815**	28	0	3	**31**	1493
Tri-Cities	26,961	**26,961**	21	0	3	**24**	1284
Walla Walla	11,997	**11,997**	10	0	0	**10**	1200
Wenatchee	4,661	**4,661**	12	0	0	**12**	388
Yakima/Sunnyside	29,071	**29,071**	23	0	1	**24**	1264
Central Oregon	47,579	**47,579**	31	0	0	**31**	1535
Eastern Oregon	8,328	**8,328**	16	0	2	**18**	521
Pendleton	12,477	**12,477**	14	0	1	**15**	891
General Office	0	**0**	93	0	0	**93**	0
TOTAL	***272,249***	***272,249***	***321***	***0***	***13***	***334***	***848***

OPEN POSITIONS		
POSITION	LOCATION	FTE
Summer Dependent	Multiple	7
Utility	Kennewick	1

YTD TERMINATIONS	COUNT
Financial Analyst	1
Central Meter Shop Leader	1
HR Generalist	1
Backhoe Operator	1
Combination Welder	1
Laborer	1
Mgr, District Ops	1
HR Manager	1
Mgr, Safety & Tech Trng	1
Total	9



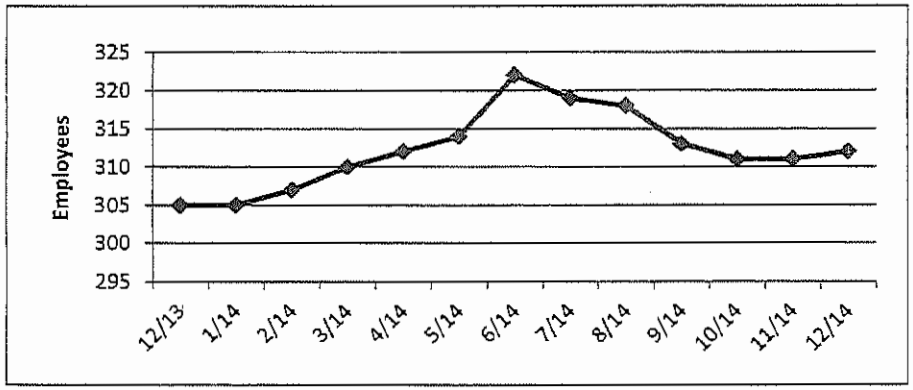


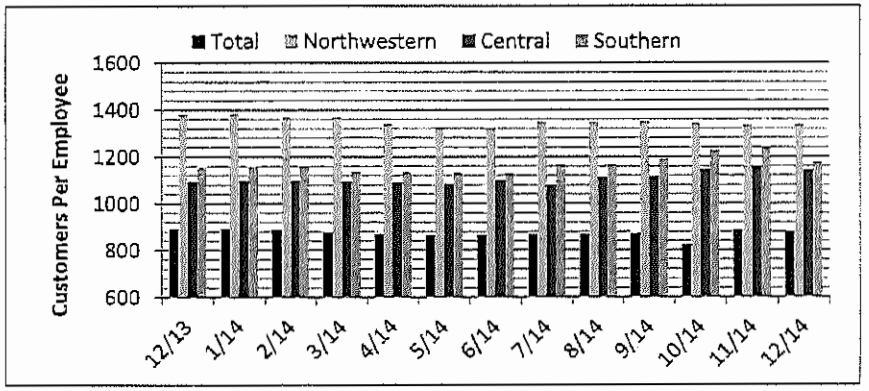
CNGC CUSTOMER & EMPLOYEE COUNT BY REGION/DISTRICT/OPERATING CENTER
12/31/14

			EMPLOYEE COUNTS				CUSTOMERS PER REG/PT EMP
REGIONS	GAS	TOTAL	REGULAR	PART TIME	TEMPORARY	TOTAL	COUNT
Northwest Region	131,263	131,263	98	0	2	100	1339
Central Region	73,284	73,284	64	0	0	64	1145
Southern Region	68,337	68,337	58	0	0	58	1178
TOTAL	*272,884*	*272,884*	*220*	*0*	*2*	*222*	*1240*
DISTRICTS	GAS	TOTAL	REGULAR	PART TIME	TEMPORARY	TOTAL	COUNT
Bellingham	47,340	47,340	28	0	1	29	1691
Bremerton	31,938	31,938	22	0	1	23	1452
Aberdeen	6,320	6,320	10	0	0	10	632
Longview	3,875	3,875	11	0	0	11	352
Mt Vernon	41,790	41,790	27	0	0	27	1548
Tri-Cities	26,791	26,791	20	0	0	20	1340
Walla Walla	12,064	12,064	10	0	0	10	1206
Wenatchee	4,735	4,735	11	0	0	11	430
Yakima/Sunnyside	29,694	29,694	23	0	0	23	1291
Central Oregon	47,179	47,179	29	0	0	29	1627
Eastern Oregon	8,486	8,486	15	0	0	15	566
Pendleton	12,672	12,672	14	0	0	14	905
General Office	0	0	90	0	0	90	0
TOTAL	*272,884*	*272,884*	*310*	*0*	*2*	*312*	*880*

OPEN POSITIONS		
POSITION	LOCATION	FTE
Operations Aide	Multiple	2
Service Mechanic	Aberdeen	1
Administrative Assistant	Kennewick	1
Backhoe Operator	Multiple	2
Utility	Multiple	3
Mgr, Human Resource	Kennewick	1
Welder	Bellingham	1

YTD TERMINATIONS	COUNT
Backhoe Operator	2
Distribution Clerk	2
Combination Welder	1
Service Mechanic	4
Technical Training Coord	1
Mgr, Enrgy Efncy & Comm Outrch	1
Temporary Laborer	10
Mgr, Standards & Compliance	1
Engineer Associate	3
Financial Specialist	1
Operations Aide	1
Gas Supply Supervisor	1
Administrative Assistant	1
Total	29





CASCADE NATURAL GAS CORPORATION
Citizens' Utility Board of Oregon
Standard Data Requests
UG 287

CUB Request No. 16

Date Due to Regulatory: **July 27, 2015**

Date prepared: July 24, 2015

Preparer: Darlene Gonzales

Contact: Pamela Archer

Telephone: (509)-734-4591

CUB DR 16 TO CASCADE

Please provide the workpapers to demonstrate need for the 15 positions in Staff DR 214, and explain what the employees will be doing once the pipe installation is complete

Response:

Location	Position	No of Positions
Bend, OR	**Engineering Associate I/II/III**	1

The region has fewer resources than we have historically (in comparison to when we had Consumer Representatives, Construction Coordinators, and a Regional Field Manager), although expectations and work requirements are much higher now. The additional Engineer Associate is necessary so that the region can continue to effectively manage the work load and meet customer expectations. See attachment 1.

Ontario, OR **Operations Aide** 1

The Southern Region has been staffed with three OA's covering the service area. In the Ontario and Pendleton districts, the OA responsibilities are more expanded that other smaller districts due to the merger of the areas. In the past, the NCSC was responsible for new customers and housed 8 representatives of which two were assigned to the Southern Region. Currently we try to just fit this work in and spread it out through the regional team. With the upturn in the economy and the forecasted trend of the growing economy and increased construction, the region, particularly Bend, continues to fall behind. See attachment 2.

CASCADE NATURAL GAS CORPORATION
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Location	Position	No of Positions
Bend, OR	**Service Mechanic**	**1**

The region has grown from 25,016 customers in 2000 to 45,935 at the end of 2013. Even with this growth, Service Mechanic staff has remained the same; however, services have exponentially and with a service area that is seven times larger. Additional staffing is required to provide and maintain a high level of safety, customer service, and emergency response. See attachment 3.

Bend, OR	**Utility**	**2**

From the leak survey assessment data provided at the end of 2011 along with the QC check in Bend in 2013, the Bend district employees are performing as they need to, however, this heightened awareness and performance adds time to each survey. With increased construction activity and require line watches, the Bend district has minimal and inadequate resources to focus on pipeline safety and integrity. See attachment 4.

Bellingham, WA	**Operations Aide**	**1**

The Bellingham & Mt Vernon Districts are dealing with an excessive amount of paperwork stemming mainly from our process to create and manage work orders for remediation work. Although this type of work is typically handled by the OAs, the Bellingham and Mount Vernon OAs are fmding the amount of workload is impossible to manage on their own. As a result, we are unable to complete the work in a timely manner; this is putting us at risk of compliance violations. We are requesting to add a 2nd permanent OA employee based out of the Bellingham District to support both Bellingham & Mt Vernon. See attachment 5.

Mount Vernon, WA	**Service Mechanic**	**1**

Adding this position is necessary so that the district can continue to effectively manage the work load handled by the Service Mechanics and to provide and maintain a high level of safety, customer service, and emergency response. See attachment 6.

Aberdeen, WA	**Service Mechanic**	**1**

This position was originally included in the response as an addition to staffing levels. The requisition was actually a job replacement that was scheduled to be filled in 2015. As such, there is no justification included.

CASCADE NATURAL GAS CORPORATION
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Location	Position	No of Positions
Yakima, WA	**Procurement Assistant**	**1**

Planned construction spending is up for Cascade Natural Gas Corp resulting in increasing workload for the department. The department has seen an increased number of purchase orders; expedite requests; receipts into warehouse; shipments; and invoices. See attachment 7.

Yakima, WA **Technical Training Coordinator** **1**

This position has been moved to the 2016 budget and therefore, no justification included.

Kennewick, WA **Training & Safety Specialist** **1**

This position has been moved to the 2016 budget and therefore, no justification included.

Kennewick, WA **Regulatory Analyst** **1**

Regulatory contemplated being able to handle one rate case at a time but that has proven to be a struggle given the delay in actually making a filing in Oregon (filing due March 31). At the time of preparing annual budgets a rate case in Washington was not contemplated for another year. However, it is now imperative to file a rate case in Washington this year thus having simultaneous cases going on. The amount of time devoted to rate cases creates the need of experiences senior level staff to help prepare and defend those rate cases as well as manage the increasing policy load being applied on the department from the various commissions. Washington in particular is increasing the number of policy workshops and rulemakings to handle commission policy directives. Oregon is trending this direction as well. Neither commission likes establishing policy in the context of a general rate case. Experienced company staff lessens the load on the director by covering some of the policy case load. Years of regulatory experience is needed to properly represent the company. It is also anticipated that in order to achieve the Company's strategic plan goal of enhanced shareholder value, Cascade will most likely be in perpetual rate cases in both jurisdictions. It was contemplated that additional staff would be needed when we got to that point in time and that time is now as opposed to a year from now.

Kennewick, WA **Supply Resource Planning Analyst** **1**

The Analyst position is to assist the Manager, Supply Resource Planning who currently has a wide swath of responsibilities, some of which include: 1) Run the IRP process for Cascade, and Liaison between the Oregon and Washington Utility Commissions for everything IRP related (a massive responsibility), 2) direct analysis for Gas Supply resource acquisition, resource and facility optimization and modeling results, 3) Keep appraised of applicable statutes, applicable pipeline tariffs, FERC proceedings and state regulatory commission rules and orders affecting gas supply acquisition and transportation, 4) PGA gas supply coordination, and 5) the new GMS project is going to provide us

CASCADE NATURAL GAS CORPORATION
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Location	Position	No of Positions

with greater functionality, flexibility, and reporting; however, Mark's expertise will still be required as we look for opportunities to increase our efficiencies and utilization of this product.

We have several very good employees in the gas supply department at Cascade, however they are either already fully utilized in their current role or are not here consistently enough to provide the assistance that the Manger needs (Gas Control employees). The Manager, Supply Resource Planning role provides tremendous value to Cascade, particularly as the face of Cascade, with the commissions, other utilities, pipelines, and export groups. Many of the responsibilities are only performed by the Manager with no backup. Consequently, not only is the risk high if this position was vacated, but the Manager is stretched thin because of the scope of current responsibilities. Additional staff would provide management the opportunity to cross train to provide much needed support and backup.

Kennewick, WA **Service Mechanic** **1**

An additional Service Mechanic in the district will allow coverage for PTO, training, sick leave, standby digs and maintenance. The district rarely has all Service Mechanics available and the additional staffing would allow continued service delivery and customer satisfaction. See attachment 8.

Southern Region EA Addition – Justification, July 2014

In the recent past the Bend district has been staffed with two EA's covering the service area with an additional one EA added in 2014 primarily focused on the West Bend replacement project phases. I asked GIS to run a comparative report with the two closest districts of Mount Vernon and Bellingham. There really is no comparison, with a service area in Bend at 3076.15 sq miles to just 423.27 sq miles for Mount Vernon and 389.57 sq miles for Bellingham. Bend's service area is over 7 times larger than the next closest, Mount Vernon.

The region, in fact, has fewer resources in this area than we have historically (in comparison to when we had Consumer Representatives, Construction Coordinators, and a Regional Field Manager) although expectations and work requirements are much higher now. This document is a justification to add one EA position to Bend. Adding this position is necessary so that the region can continue to effectively manage the work load handled by the Engineer Associates as detailed below and provide a higher level of customer service Cascade is known for.

Primary Reasons for EA Additions:

Existing EA's are completely consumed with the routine customer acquisition responsibilities outlined at the end of this document. This leaves very minimal and inadequate resources for important tasks such as:

Contractor Oversight
It is necessary to use contractors for the performance of nearly all the new construction activity in these three districts. The existing EAs struggle to perform one contractor inspection per month per crew as required by our current procedures. One contractor inspection per month is not adequate to ensure facilities are installed professionally and in accordance with codes, CNG procedures, and city and county expectations. At least half of a FTEs time should be dedicated to this task alone.

Contractors or temporary employees are also used for a variety of other tasks including residential meter set painting, large facility painting, ROW clearing, and facility maintenance including brush cutting and spraying. Inadequate resources exist to properly review the work of these contractors or employees.

Remediation of AOCs
With the completion of nearly 5000 remediation orders, our database continues to grow as issues are identified with more challenging tasks pending. When looking at the tracking spreadsheet in SharePoint, it is clear we require additional resources to continue with the remediations. In addition to resources to perform the actual work, many of these items require customer coordination and project planning. There are currently inadequate EA resources to manage these tasks and ensure completion within acceptable time frames. Lack of resources for planning this work is as large a constraint as lack of resources to perform the work.

Construction Management and Planning
With current staffing levels, we are unable to dedicate resources to attendance at all pre-construction meetings and to coordination efforts with cities, counties, and state. As a result, some projects are poorly planned resulting in inefficiencies during construction. Additionally, resources are not available to properly identify city, county, and ODOT projects that may impact gas facilities and proactively estimate costs for budgeting purposes. This has historically created budget surpluses or shortfalls.

Management of Large Projects
With capital budget projection in the tens of millions and Engineering anticipating higher than historical capital expenditure in the region for the foreseeable future, coupled with the pickup of the economy and city relocatiou projects, the EA position will be needed in the district to help manage this work:

1) Assist with or perform project management responsibilities.
2) Assist with or perform permitting and land acquisition work.
3) Assist with or coordinate and manage the bidding process.

Routine Customer Acquisition Responsibilities:
With existing EA staffing levels, nearly all their time is consumed with the routine tasks outlined below:

1) Measure or coordinate measurement of new and conversion services
2) Make contact with new potential customers and provide them information on requirements for gas service
3) Meet potential new service customers and developers on site to review options
4) Work closely with other local utilities to acquire joint trench plans
5) Estimate main costs
6) Prepare and coordinate all information required for development project approvals including
    a. Coordinate credit analysis
    b. Coordinate and incorporate engineering reviews
    c. Prepare developer checklist
    d. Prepare proposed contracts
    e. Perform feasibility analysis
    f. Consolidate information for submittal for approval
7) Coordinate contract signing and acquisition of payment from developers after project approval
8) Scheduling CNG and contractor crews

Southern Region OA Addition – Justification, July 2014

The Southern Region has been staffed with three OA's covering the service area. In the Ontario and Pendleton districts, the OA responsibilities are more expanded that other smaller districts due to the merger of the areas. Currently we have a temporary OA working in the region and we still have an overabundance of work relating to the duties assigned to the group. In the past, the NCSC was responsible for new customers and housed 8 representatives of which two were assigned to the Southern Region. Currently we try to just fit this work in and spread it out through the regional team. With the upturn in the economy and the forecasted trend of the growing economy and increased construction, the region, particularly Bend, continues to fall behind.

This document is a justification to add one OA position to the Southern Region. Adding this position is necessary so that the region can continue to effectively manage the work load handled by the Operations Aides as detailed below and provide a higher level of customer service Cascade is known for. We will look to utilize this position to focus on new construction as the Aberdeen OA does in the Northwestern Region.

Primary Reasons for OA Addition

Add an OA position whose primary role will be working with EAs on new customer acquisition, service line modifications, CLS meter and rate changes in the Southern Region

Central OR has averaged 131 new meter sets per month through 6/2014 adding 785 new meters FYTD. EAs continue to average 100+ new service lines per month in the Central OR District. Pendleton has added another 35 meters and Eastern OR 24 for a region total of 844 meters FYTD. OA is involved in service modification/retire/replacement related to CC&B customer support such as creating field activities, customer contact coordination/documentation for interruption/restoration of service along with updates to the Person/Account and Meter/SPID. OA ensures field activities get created for all field visits by servicemen during the construction process.

Phase III Bend Replacement Project requires additional, local customer service support to streamline CC&B communications and restoration of service as each line is replaced and brought back into service.

OAs are involved in customer notifications/follow-up, documentation in CC&B along with CSC/district communications due to interruption in service following emergent damage/leak repairs to ensure are services are restored.

Average meter FAs Central OR District Jan-Jun '14 = 1710 per month
Southern Region Jan-Jun '14 = 2109 per month

Average meter & maintenance FAs Central OR District Jan-Jun '14 = 3299 per month
Southern Region Jan-Jun '14 = 5207 per month

Routine Administrative/Customer Service Responsibility consuming current OA staffing level:

Provide a wide variety of administrative tasks for District office including, but not limited to, operations staff, construction/EAs, customer service, CC&B, WMS and maintains Access Database for Standby.

Operation Aide Reports for Audit/follow-up:

Daily Crystal Reports PCAD/CC&B follow-up:

CI1431 – CNG Leak Order Audits
CI1576 – PCAD CGI Cancel Report
CI1584 – All Turn Off – Remove Meter Follow-Up
CI1586 – ALL PCAD Office Review Report
CI1806 – ALL PCAD orders requiring data entry

Weekly Reports PCAD/CC&B follow-up:

CI1538 – Invalid District and Town Combinations
CS1527M – ALL Missing Premise Requirements
DT1266 – ALL Field Orders Not Completed
DT1514 – ALL Pending and Held Field Activities
CI1577 – CNG PCAD M-App Field Report
CI1807 – ALL Active SA's w/meter history of OFF
CI1808 – ALL active SA's w/disconnected SP
CI1786 – CNG Invalid Shutdown Codes

Run as Needed PCAD/CC&B follow-up:

DT1489 – ALL List of Meters for Family Testing (generated by Measurement)
CI1694 – ALL List of Meters with Canceled G-Test
CI1785 – CNG District PBI Report
DT0856 – CNG Atmospheric Corrosion Survey Listing (AC survey)
DT1479 – ALL Field Activity Dashboard
DT0862 – CNG Emergency Shutdown (line breaks)
CI1811 – CNG After Hours Call Out Report

Additional day-today OA duties

Respond to email/snail mail requests from CSC, Rev Admn and district staff for assistance and/or follow-up with local customer service
Process field collections from servicemen
Administrative tasks associated with safety meetings & record retention requirements
Manage FICA database creating FOs, completing FOs in CC&B, maintaining FICA spreadsheet

Follow-up with cities/counties regarding tax status corrections and address changes working with Rev Admn who performs any billing corrections
Administrative support to district management in updating ICS emergency contacts
Administrative support for compliance documentation record keeping supporting management
Process accounts payable (PCARD and by invoice)
Mail customer service letters from CC&B: Access, dog, remove foliage, results of service call
Acts as administrative and/or customer service liaison between customer, District Office and General Office Personnel
Creates all chart change, and sniff test FAs in CC&B

<u>OAs in single manager districts take on additional roles</u>

Provide executive administrative support to District Manager in all aspects, including, but not limited to service mechanic staffing/scheduling, public awareness and any compliance support needed.
Safety meeting preparation, minutes and record keeping requirements
Mobile Up updates to scheduling of PTO and Standby changes
Constant support and contact with servicemen during the day to schedule additional work orders and filter information to them regarding specific orders

Southern Regiou SM Addition – Justification, July 2014

After our Senior Management meeting in Kennewick where we were made aware of the Service Matrix file place in SharePoint, we began to take a close look at the data delivered out of CCB in order to make some data based business decisions.

In the recent past the Southern Region has been staffed with nine SM's covering the service area. I asked GIS to run a comparative report with the two closest districts of Mount Vernon and Bellingham. There really is no comparison, with a service area in Bend at 3076.15 sq miles to just 423.27 sq miles for Mount Vernon and 389.57 sq miles for Bellingham. Bend's service area is over 7 times larger than the next closest, Mount Vernon.

The region has grown from 25,016 customers in 2000 with 45,935 at the end of 2013, all with a 5 year recession that has seeming ended as construction is rocking down here and projected to only increase in the future. With this growth, our SM staff has remained the same but the customers/SM has climbed exponentially with a 7 times larger service area and expectations of work requirements at a much higher level.

This document is a justification to add two SM positions to the Bend District. Adding these positions is necessary so that the region can continue to effectively manage the work load handled by the Service Mechanics as detailed below and in the attached files, providing a higher level of safety, customer service, and emergency response that Cascade is known for.

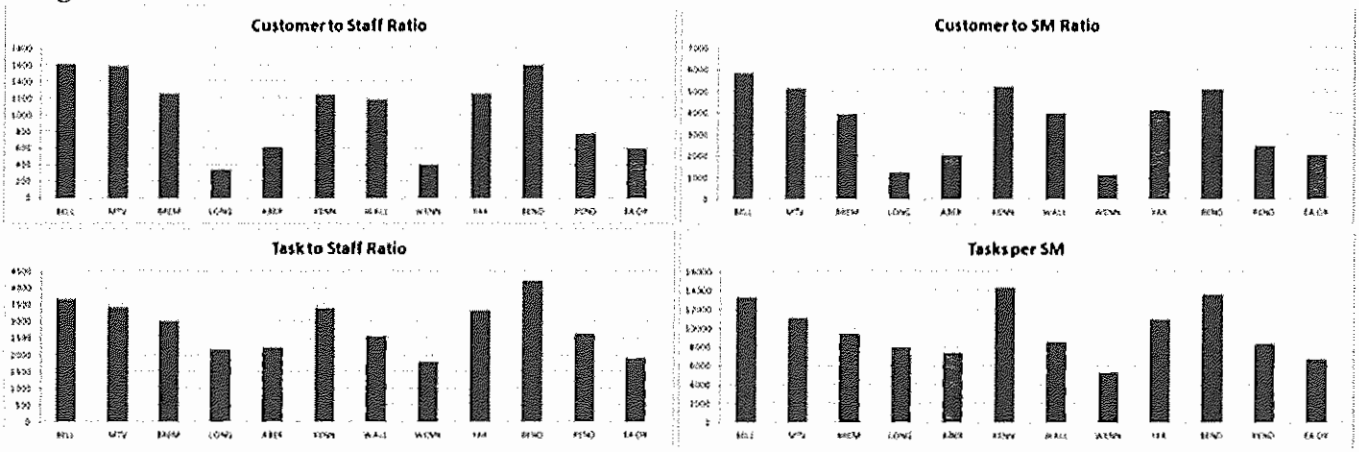
Primary Reasons for SM Additions:

The attached excel files will show specific data trends justifying two additional SM positions. Existing SM's are completely consumed with the daily tasks. This leaves very minimal and inadequate resources to focus on safety, customer service, and emergency response.

The attached excel 2013 static data file has a optimized tab suggesting SM levels using goal seek off of 2013 aggregated Task to SM ratio and the live data file, where you can select the data year on the district sheets. This will change the numbers in the summary sheets.

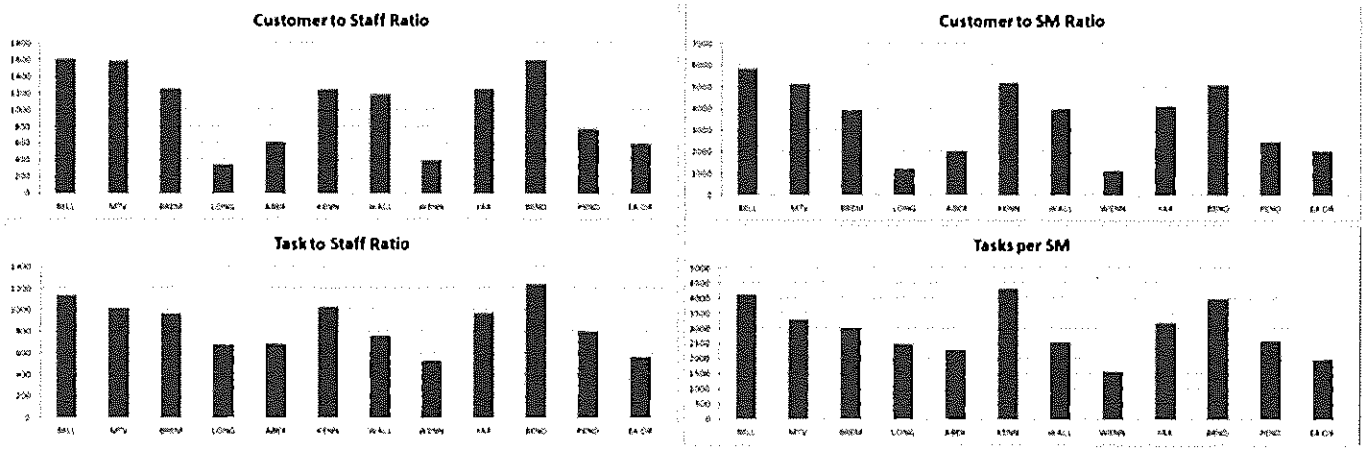
The data is showing predictable trends that can be seen in the fact that the pattering of the ratios over the long term (using live data sheet) matches the last full calendar year ratios for CY 2013. Order of magnitude is higher for the larger data window, but relatively speaking the patterns are the same. This could be taken as a sign that these numbers can be reasonably projected forward.

Using live data sheet with CY 2011-CYTD2014 data…



Bend's Task to Staff Ratio is nearly 200 more per SM than the other larger districts. Looking at the Customer to Staff Ratio the numbers are very close but this does not factor in drive time related to the service area as described above.

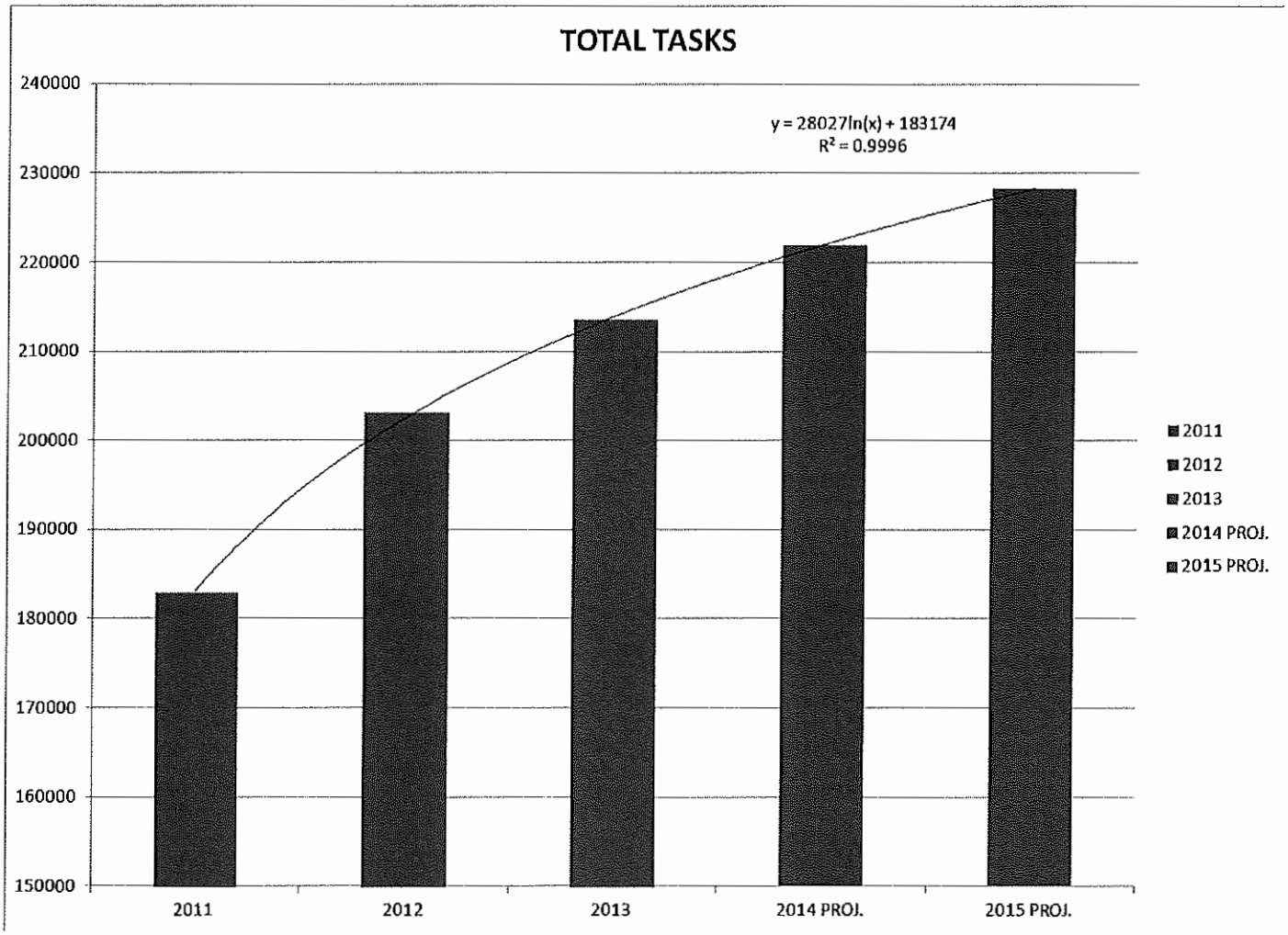
2013 Static Data



Looking at the summary tab, you can see Bend is in the top 10 of the majority of the orders with Bellingham coming in second.

	Historical Data			CY14/15 Projections		2013 Data											
	2011	2012	2013	2014 PROJ.	2015 PROJ.	BELL	MTV	BREM	LONG	ABER	KENN	WALL	WENN	YAK	BEND	PEND	EA OR
APPLIANCE TOTALS:	7212	6459	6847			1139	760	630	207	208	380	282	115	882	1486	476	282
COLLECTION TOTALS:	6298	15088	14923			2140	2151	1981	282	533	931	499	260	2219	2093	1005	829
CONSTRUCTION TOTALS:	375	500	199			49	25	15	4	6	22	15	29	12	12	11	5
EMERGENCY TOTALS:	8700	8169	9291			1638	1272	821	172	238	806	346	198	850	1653	902	395
RELOCATE TOTALS:	52247	53260	55290			8677	5478	6397	2795	1480	6129	1969	2858	6190	6869	2747	1701
MAINTENANCE TOTALS:	12684	18928	23395			2126	2231	2843	1693	1293	2588	777	1055	2587	3151	2021	1030
METER TOTALS:	90531	98214	101213			16705	14236	11342	2069	3008	10652	3733	1843	9727	18658	5623	3617
OTHER TOTALS:	4918	2550	2449			620	296	171	302	124	236	53	41	93	222	197	94
TOTAL:	182965	203168	213607	222028	228282	33088	26449	24200	7524	6890	21744	7674	6399	22560	36144	12982	7953
CUSTOMERS			268407			46800	41402	31580	3827	6229	26199	11873	4685	28942	46190	12386	8294
STAFF Total			217			29	26	25	11	10	21	10	12	23	29	16	14
STAFF:SM			67	67	67	8	8	8	3	3	5	3	4	7	9	5	4
MILES			2853441			346798	318481	308905	149404	161104	271017	82011	124393	317351	386377	232221	155379
DIST:SQ MI						390	423								3076		
TASK:STAFF			984			1141	1017	968	684	689	1035	767	533	981	1246	811	568
CUST:STAFF			1237			1614	1592	1263	348	623	1248	1187	990	1258	1593	774	592
TASK:SM			3188	3314	3407	4136	3306	3025	2508	2297	4349	2558	1600	3223	4016	2596	1988
CUST:SM			4006			5850	5175	3948	1276	2076	5240	3958	1171	4135	5132	2477	2074
MILES:STAFF			13149			11959	12249	12356	13582	16110	12906	8201	10366	13798	13323	14514	11098
SQ MI:SM						49	53								342		

The data shows a predictable task growth trend that is consistent based on current data from 2011 forward predicting into 2015.



When looking at the optimized data collected for SM numbers based upon 2013 data with a target of 3200 orders per SM, this data is indicating that Bend should have an addition of two SM's. Also looking at this very telling data, it indicates Mount Vernon is currently optimized but will likely not be so in the next couple of years. The table also reflects that Kennewick should have two additional SM and Bellingham should have two additional SM's.

	Historical Data			CY 14/15 Projections based on 3200 orders.		*Optimal SM numbers based upon 2013 data. Targeted approx. 3200 orders per SM (pre-optimized average)											
	2011	2012	2013	2014 PROJ.	2015 PROJ.	BELL	MTV	BREM	LONG	ABER	KENN	WALL	WENN	YAK	BEND	PEND	EA OR
APPLIANCE TOTALS:	7212	6459	6847			1139	760	630	207	208	380	282	115	882	1486	476	282
COLLECTION TOTALS:	6298	15088	14923			2140	2151	1981	282	533	931	499	260	2219	2093	1005	829
CONSTRUCTION TOTALS:	375	500	199			43	25	15	4	6	22	15	29	12	12	11	5
EMERGENCY TOTALS:	8700	8169	9291			1638	1272	821	172	238	806	346	198	850	1653	902	395
LINE LOCATE TOTALS:	52247	53260	55290			8677	5478	6397	2795	1480	6129	1969	2858	6190	8869	2747	1701
MAINTENANCE TOTALS:	12684	18928	23395			2126	2231	2843	1693	1293	2588	777	1055	2587	3151	2021	1030
METER TOTALS:	90531	98214	101213			16705	14236	11342	2069	3008	10652	3733	1843	9727	18658	5623	3617
OTHER TOTALS:	4918	2550	2449			620	296	171	302	124	236	53	41	93	222	197	94
TOTAL	182965	203168	213607	222028	228282	33088	26449	24200	7524	6890	21744	7674	6399	22568	36144	12982	7953
CUSTOMERS			268407			46800	41402	31580	3827	6229	26199	11873	4685	28942	46190	12386	8294
STAFF TOTAL			217			29	26	25	11	10	21	10	12	23	29	16	14
STAFF SM			67	69	71	10	8	8	3	3	7	3	4	7	11	5	4
MILES			2853441			346798	318481	308905	149404	161104	271017	82011	124393	317351	386377	232221	155379
DIST SQ MI						390	423								3076		
TASK:STAFF			984			1141	1017	968	684	689	1035	767	533	981	1246	811	568
CUST:STAFF			1237			1614	1592	1263	348	623	1248	1187	390	1258	1593	774	592
TASK:SM			3188	3200	3200	3200	3306	3025	2508	2297	3200	2558	1600	3223	3200	2596	1988
CUST:SM			4006			4526	5175	3948	1276	2076	3856	3958	1171	4135	4089	2477	2074
MILES:STAFF			13149			11959	12249	12356	13582	16110	12906	8201	10366	13798	13323	14514	11098
SQ MI:SM						38	53								272		

Days to Comply	Days to Target	City	Estimated Man Days	Unit Number	Description	Service Type	% Due	Last Completed Date	Target Date	Compliance Date	Order Number	Task Frequency	Business Unit
81	21	Bend	44	T090LKSV	LEAK SURVEY	475YR03	100	5/5/2009	6/6/2014	8/5/2014	167163	1825	41
121	61	Prineville	2	D041HPRS10	S10 - PRINEVILLE DISTRIBUTION	47HIGH	92	6/14/2013	7/16/2014	9/14/2014	203895	365	41
124	64	Prineville	2	D041HPRS7	S7 - 6 IN PRINEV HP LINE PH1	47HIGH	91	6/17/2013	7/19/2014	9/17/2014	203613	365	41
124	64	Prineville	2	D041HPRS8	S8 - 6 IN PRINEV HP LINE PH2	47HIGH	91	6/17/2013	7/19/2014	9/17/2014	203614	365	41
124	64	Prineville	2	D041HPRS9	S9 - 6 IN& 8 IN PRINEV HP PH3	47HIGH	91	6/17/2013	7/19/2014	9/17/2014	203615	365	41
125	65	Prineville	6	T719LKSV	LEAK SURVEY	475YR02	98	6/18/2009	7/20/2014	9/18/2014	167368	1825	41
135	75	Sunriver	2	D041HPRS11	S11 - 4 IN SUNRIVER HP LINE	47HIGH	88	6/28/2013	7/30/2014	9/28/2014	203516	365	41
136	76	Redmond	2	D041HPRS16	S16 - 6 IN REDMOND HP LINE	47HIGH	88	6/29/2013	7/31/2014	9/29/2014	203517	365	41
136	76	Redmond	2	D041HPRS22	S22 - 8 IN REDMOND HP LINE	47HIGH	88	6/29/2013	7/31/2014	9/29/2014	203518	365	41
136	76	Redmond	2	D041HPRS3	S3 - 4 IN REDMOND HP LINE	47HIGH	88	6/29/2013	7/31/2014	9/29/2014	203519	365	41
155	95	Redmond	13	T737LKSV	LEAK SURVEY	47DIST01	83	7/18/2013	8/19/2014	10/18/2014	204819	365	41
156	96	Prineville	12	T719LKSV	LEAK SURVEY	47DIST01	82	7/19/2013	8/20/2014	10/19/2014	204440	365	41
187	127	Sunriver	3	T835LKSV	LEAK SURVEY	47DIST01	74	8/19/2013	9/20/2014	11/19/2014	206916	365	41
188	128	Bend	2	D041HPRS14	S14 - 4 IN PRONGHORN DR. HP	47HIGH	73	8/20/2013	9/21/2014	11/20/2014	205978	365	41
188	128	Bend	2	D041HPRS20	S20 - 8 IN SIMPSON HP LINE	47HIGH	73	8/20/2013	9/21/2014	11/20/2014	205982	365	41
188	128	Bend	2	D041HPRS21	S21 - 6 IN CHINA HAT HP LINE	47HIGH	73	8/20/2013	9/21/2014	11/20/2014	205983	365	41
188	128	Bend	2	D041HPRS23	S23 - 8 IN NORTH BEND HP LINE	47HIGH	73	8/20/2013	9/21/2014	11/20/2014	206070	365	41
189	129	Bend	2	D041HPRS13	S13 - 6 IN SOUTH BEND HP LINE	47HIGH	73	8/21/2013	9/22/2014	11/21/2014	205977	365	41
189	129	Bend	2	D041HPRS15	S15 - 6 IN 15TH ST HP LOOP	47HIGH	73	8/21/2013	9/22/2014	11/21/2014	205979	365	41
191	131	Bend	2	D041HPRS1	S1 - 6 IN BEND HP LINE	47HIGH	73	8/23/2013	9/24/2014	11/23/2014	205976	365	41
192	132	Brasada	2	D041HPRS19	S19 - 4 IN BRASADA HP LINE	47HIGH	72	8/24/2013	9/25/2014	11/24/2014	205981	365	41
194	134	Lapine	2	D041HPRS17	S17 - LAPINE HP DISTRIBUTION	47HIGH	72	8/26/2013	9/27/2014	11/26/2014	205980	365	41
195	135	Gilchrist	2	D041HPRS4	S4 - 4 IN GILCHRIST HP LINE	47HIGH	72	8/27/2013	9/28/2014	11/27/2014	205984	365	41
195	135	Gilchrist	2	T313LKSV	LEAK SURVEY	47DIST01	72	8/27/2013	9/28/2014	11/27/2014	206002	365	41
195	135	Lapine	7	T514LKSV	LEAK SURVEY	47DIST01	72	8/27/2013	9/28/2014	11/27/2014	206006	365	41
196	136	Cresent	2	D041HPRS5	S5 - 2 IN CRESCENT HP LINE	47HIGH	71	8/28/2013	9/29/2014	11/28/2014	205985	365	41
196	136	Chemult	2	D041HPRS6	S6 - 2 IN CHEMULT HP LINE	47HIGH	71	8/28/2013	9/29/2014	11/28/2014	205975	365	41
196	136	Cresent	4	T161LKSV	LEAK SURVEY	47DIST01	71	8/28/2013	9/29/2014	11/28/2014	206912	365	41
197	137	Chemult	2	T138LKSV	LEAK SURVEY	47DIST01	71	8/29/2013	9/30/2014	11/29/2014	206911	365	41
206	146	Sunriver	7	T835LKSV	LEAK SURVEY	475YR03	93	9/8/2009	10/9/2014	12/8/2014	170261	1825	41
213	153	Redmond	8	T737LKSV	LEAK SURVEY	475YR02	93	9/15/2009	10/16/2014	12/15/2014	170428	1825	41
229	169	Bend	2	D041HPRS18	S18 - NORTH BEND HP DISTR	47HIGH	61	10/4/2013	11/1/2014	12/31/2014	206511	365	41
229	169	Bend	56	T090LKSV	LEAK SURVEY	47DIST01	61	10/4/2013	11/1/2014	12/31/2014	206910	365	41
		Total Survey Days Remaining	**206**										
425	365	Madras	5	T543LKSV	LEAK SURVEY	47SYR05	81	4/15/2010	5/16/2015	7/15/2015	175170	1825	41
425	365	Madras	10	T543LKSV	LEAK SURVEY	47DIST01	8	4/15/2014	5/16/2015	7/15/2015	211690	365	41
426	366	Metolius	2	D041HPRS12	S12 - 4 IN METOLIUS HP LINE	47HIGH	8	4/16/2014	5/17/2015	7/16/2015	211662	365	41
431	371	Madras	2	D041HPRS2	S2 - 4 IN MADRAS HP LINE	47HIGH	7	4/21/2014	5/22/2015	7/21/2015	211663	365	41

431	371	Metolius	5	T567LKSV	LEAK SURVEY	47DIST01	7	4/21/2014	5/22/2015	7/21/2015	211691	365	41
504	444	Bend	50	T090LKSV	LEAK SURVEY	475YR04	77	7/2/2010	8/3/2015	10/2/2015	177485	1825	41
536	476	Prineville	6	T719LKSV	LEAK SURVEY	475YR03	75	8/3/2010	9/4/2015	11/3/2015	178200	1825	41
572	512	Sunriver	12	T835LKSV	LEAK SURVEY	475YR04	73	9/9/2010	10/10/2015	12/9/2015	178923	1825	41
583	523	Redmond	20	T737LKSV	LEAK SURVEY	475YR03	73	9/20/2010	10/21/2015	12/20/2015	179251	1825	41
855	795	Prineville	3	T719LKSV	LEAK SURVEY	475YR04	58	6/17/2011	7/19/2016	9/17/2016	185538	1825	41
888	828	Redmond	3	T737LKSV	LEAK SURVEY	475YR04	56	7/20/2011	8/21/2016	10/20/2016	185923	1825	41
944	884	Bend	37	T090LKSV	LEAK SURVEY	475YR05	53	9/15/2011	10/16/2016	12/15/2016	188215	1825	41
960	900	Madras	4	T543LKSV	LEAK SURVEY	475YR06	50	11/15/2011	11/1/2016	12/31/2016	188567	1825	41
960	900	Sunriver	11	T835LKSV	LEAK SURVEY	475YR05	51	10/20/2011	11/1/2016	12/31/2016	188233	1825	41
1147	1087	Madras	11	T543LKSV	LEAK SURVEY	475YR02	42	4/6/2012	5/7/2017	7/6/2017	192570	1825	41
1194	1134	Bend	64	T090LKSV	LEAK SURVEY	475YR06	39	5/22/2012	6/23/2017	8/22/2017	194564	1825	41
1231	1171	Prineville	10	T719LKSV	LEAK SURVEY	475YR05	37	6/28/2012	7/30/2017	9/28/2017	194570	1825	41
1259	1199	Sunriver	8	T835LKSV	LEAK SURVEY	475YR06	36	7/26/2012	8/27/2017	10/26/2017	195780	1825	41
1318	1258	Redmond	16	T737LKSV	LEAK SURVEY	475YR05	32	9/24/2012	10/25/2017	12/24/2017	196906	1825	41
1528	1468	Madras	4	T543LKSV	LEAK SURVEY	475YR03	21	4/22/2013	5/23/2018	7/22/2018	202733	1825	41
1604	1544	Bend	71	T090LKSV	LEAK SURVEY	475YR02	17	7/6/2013	8/7/2018	10/6/2018	204429	1825	41
1605	1545	Redmond	4	T737LKSV	LEAK SURVEY	475YR06	17	7/7/2013	8/8/2018	10/7/2018	204442	1825	41
1607	1547	Prineville	10	T719LKSV	LEAK SURVEY	475YR06	17	7/9/2013	8/10/2018	10/9/2018	204439	1825	41
1634	1574	Sunriver	11	T835LKSV	LEAK SURVEY	475YR02	15	8/5/2013	9/6/2018	11/5/2018	206334	1825	41
1879	1819	Madras	8	T543LKSV	LEAK SURVEY	475YR04	2	4/8/2014	5/9/2019	7/8/2019	211689	1825	41
		Total Survey Days	593										

141	4	564	Avg per year
	Total days over 5 years	1157	231.4

Working days	260
Working days with exceptions	237

Hours charged from Bend WO 209831

Row Labels	Sum of Hours
3/26/2014	134.5
4/9/2014	103
4/23/2014	159
5/7/2014	58.5
5/21/2014	75
6/4/2014	38
6/18/2014	36
Grand Total	604

Avg hrs /month	201.3333
10 months of MEA	2013.333

		Avg hrs subtracting out PTO(4 wks)/Sick(3 days)
FTE		184 hrs total
	2080	1896

Southern Region Utility Addition – Justification, July 2014

The Southern Region is staffed with 8 construction employees covering the service area. I asked GIS to run a comparative report with the two closest districts of Mount Vernon and Bellingham. There really is no comparison, with a service area in Bend at 3076.15 sq miles to just 423.27 sq miles for Mount Vernon and 389.57 sq miles for Bellingham. Bend's service area is over 7 times larger than the next closest, Mount Vernon.

The region has grown from 25,016 customers in 2000 with 45,935 at the end of 2013, all with a 5 year recession that has seeming ended as construction is rocking down here and projected to only increase in the future. With this growth, our construction staff has remained the same with the exception of one Utility position in 2013 to aid with locating. Looking at the specifics of miles of main pipeline and service pipelines, Bend has climbed exponentially with a 7 times larger service area and expectations of work requirements at a much higher level.

Main Pipeline Miles:

- Bend – 974.81
- Mt Vernon - 805.57
- Bellingham - 852.78

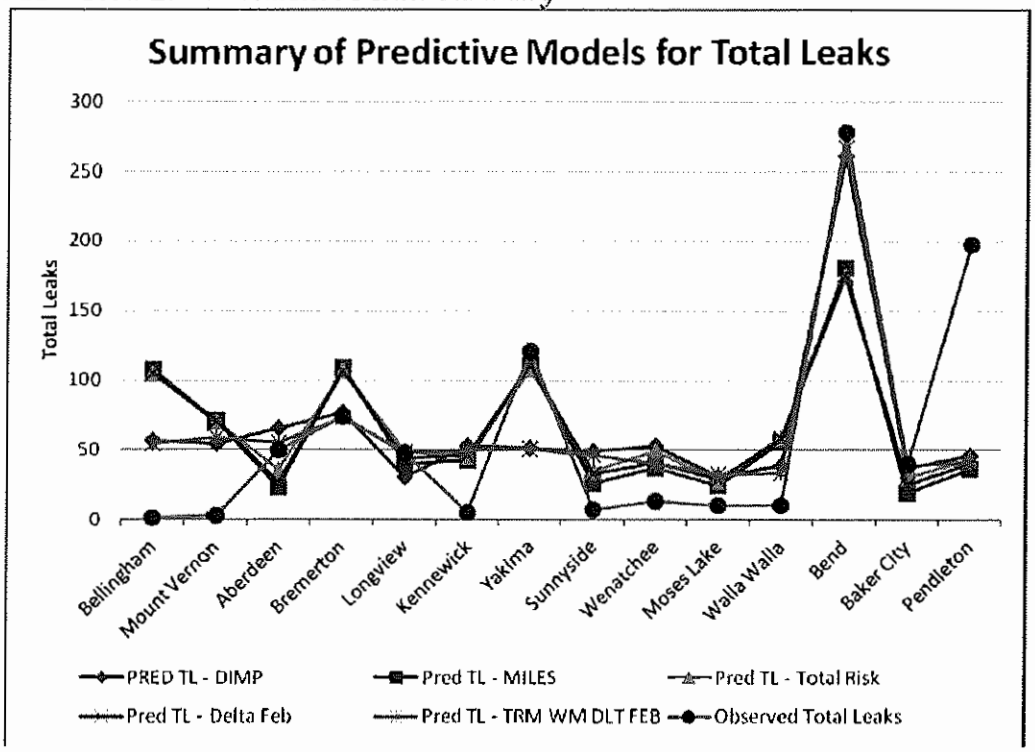
This document is a justification to add two Utility positions to the Bend District. Adding these positions is necessary so that the region can continue to effectively manage the leak survey work load handled by the Utility position and to cover the other areas during MEA training looking to provide a higher level of pipeline safety and integrity that Cascade is known for.

Primary Reasons for Utility Additions:

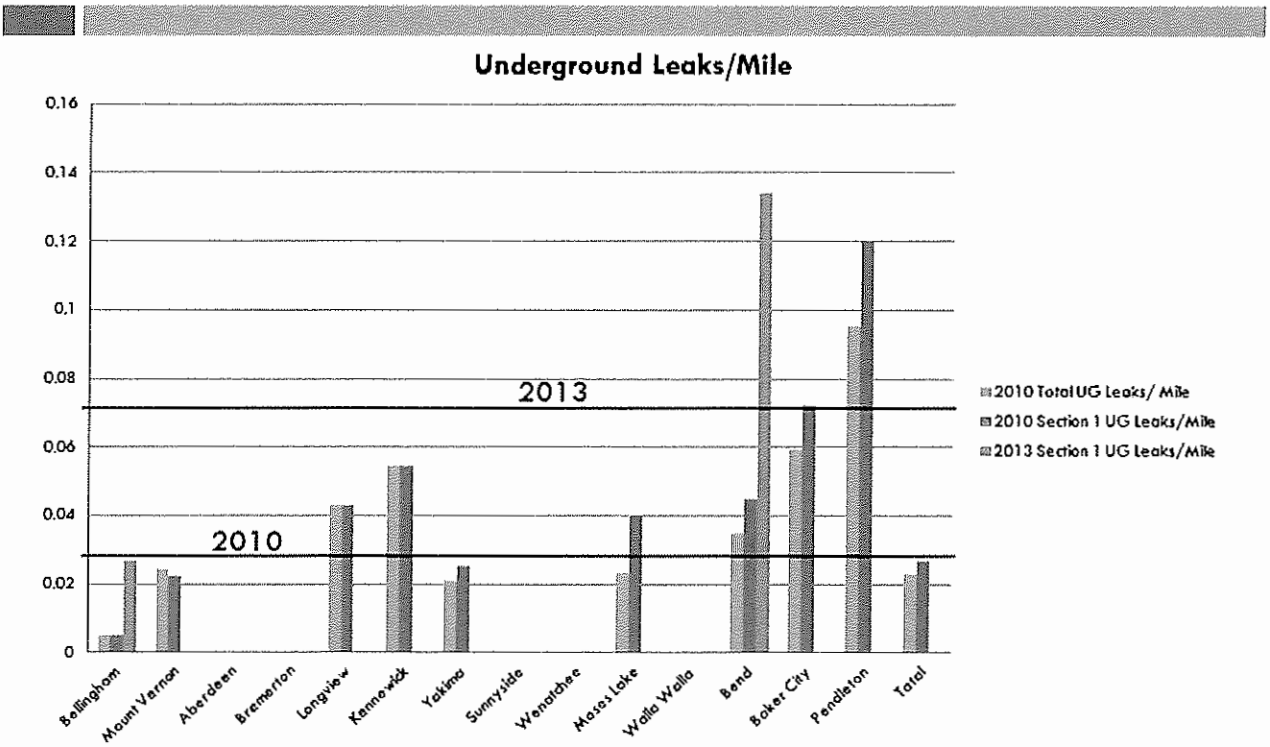
From the leak survey assessment data provided at the end of 2011 along with the QC check in Bend in 2013, the Bend district employees are performing as they need to, however, this heightened awareness and performance adds time to each survey. With increased construction activity and require line watches, the Bend district has minimal and inadequate resources to focus on pipeline safety and integrity.

Below are a screen shots from the Leak Survey Assessment showing where the Bend District is in relation to total leaks and one from the assessment in 2013, and is a direct reflection of the employee's dedication to doing the job right.

Figure 11 – Total Leaks Predictive Model Summary



Rising Aggregated Leaks per Mile



We conducted a specific assessment relating to all leak survey sections in the Bend district, pulled all files over the past 5 years and tallied the total survey days. Attached is that summary. We have a total of 1157 survey days for all annual and 5 year surveys. This is an average of 231 days per year. With two surveyors working the task this is roughly 115 days to complete in a typical year without being pulled off. Using an average of 4 week's vacation and 3 sick days per year, the average is 237 working days each year. With the unpredictability of the Central Oregon weather, leak surveying typically takes place March-Oct. Additional tasks the district faces is as follows:

Standby Digs: As construction picks up so do the pipeline monitoring activities. For the safety of our pipelines, we must have the appropriate personnel in place without robbing from other compliance related tasks.

Leak Investigation: As the employees are more diligent and focused on their leak survey efforts and more leaks are found there is more time associated with the leak investigations and follow ups.

Leak Remediation: Many of the leaks found are underground leaks which at times pulls from our leak survey workforce to repair. Many of these are in the ROW and require additional employees for the safety and efficiency of the team.

Corrective Action Remediation: We have over 900 WO's out of compliance with another 319 about to be out of compliance and many of these require a full crew to remediate.

MEA -

As Cascade is aware, MEA training has also impacted our workforce. As we reviewed WO 209831 which was set up in March to track the MEA training, it is clear this is equivalent to 1 FTE. The average of 201.333 hours per month over the 3 months is shown below. Multiplied out over 10 months is 2013.333 hours which has been taken away from the district. Looking at the average hours available per employee of 1896 (2080 – 160 (4 weeks vacation) – 24 (3 days Sick)), it is evident we require additional resources to get our work done. I propose the addition of one Utility that will float between Construction and Service to fill in this gap created by a much needed and valued training program, thus providing improved safety, customer service, efficiency, and overall Operational Excellence.

Hours charged from Bend WO 209831

Row Labels	Sum of Hours
3/26/2014	134.5
4/9/2014	103
4/23/2014	159
5/7/2014	58.5
5/21/2014	75
6/4/2014	38
6/18/2014	36
Grand Total	604

Avg hrs /month	201.3333
10 months of MEA	2013.333

FTE	Avg hrs subtracting out PTO(4 wks)/Sick(3 days) 184 hrs total
2080	1896

Administrative Services – Responsibilities

As you are aware, planned spend is up this year. For our department this translates to increased:

- Number of purchase orders
- Potential expedite requests
- Number of receipts into warehouse
- Number of shipments
- Number of order follow ups/shipping issues to rectify
- Number of invoice which means number of Docusphere transactions and billing follow up for pricing/quantity/AP issues/etc.

We still do not have specifications or standardized designs and I [Manager, Administrative Services] am the only one working with the engineers on jobs. We are working with Construction Services much closer this year to prevent some of the ordering inaccuracy and timeliness issues we experienced last year.

This obviously doesn't capture everything affected by an increase in field activity. I hope it does, however, help bring to light that an increase in field activity without an increase in support roles is setting us up for failure. It is early in the year and we are already feeling the effects of being spread thin and not being able to give needed attention to our stocking and ordering functions. When we receive a replenishment list it may take 2 or 3 days to get it turned around because we get pulled in other directions. We don't have the time to review stock like we should and as a result we experienced a light commercial meter stock out situation recently.

Current Administrative Services Manager responsibilities include:

- Inventory Reduction/Management
    - Facilitate physical inventory count for all locations at CNG
    - Facilitate tracking and recordkeeping (Certs) of underground materials for compliance.
    - Consumable and safety item inventory (order/receive/stock/ship)
    - Establish (manually) appropriate order points for materials
- Central Stores Management
    - 2 union employees (1 CDL who delivers to **ALL** facilities/jobsites)
    - Surplus and obsolete inventory from ?? years of operating
    - Material stock for ALL districts to pull from/special orders/job material receiving
    - Located in Yakima, WA (1.25 hr from GO)
- Product Research/Specification – frequent requests from engineering and districts
- General Office Meetings/Events – safety, manager, engineering, compliance, operations meetings and misc. events that our dept. is asked to prepare the GO for.

Administrative Services – Responsibilities

- Compliance Work – particularly standardization documentation (i.e. tools, instruments, signage)
- General Office facility management (also see Procurement Assistant duties)
    - Janitorial
    - Landscaping
    - Fire system
    - Elevator
    - HVAC
    - General repairs
    - Safety/First Aid
    - General complaints and issues
- Vendor relations – cultivate vendor relationships
- MDU/IGC Interface
- National Accounts – educate districts on the use of and communicate the availability
- Engineering/Engineering Associate/Pipeline Safety/Corrosion Control Support/Measurement – Engineering now fully staffed with three new hires in the last month. Five Engineering Associates added in 2013. Pipeline Safety department of five plus manager and Corrosion Control department has four plus a manager. Includes vendor product research/quoting/lead time research/etc. for these departments/individuals.
- District Support (Managers/Clerks/Ops Aides) – Product/Tool research, quoting, ordering, vendor questions, etc
- CNG Fleet – Issue PO, coordinate with managers/drivers, license, sell/dispose
- Offsite Storage – Relocate records from Iron Mtn./manage ongoing offsite vendor (CIIM)
- GO Fleet Management – maintenance/scheduling/mileage tracking
- Defective and Unacceptable materials – point of collection from the field, follow up with engineering/compliance/districts and coordinate with vendors for appropriate disposition and resolution.
- Employee badging
- IT (laptop/desktop/monitors/mobile fleet equipment) procurement
- Manage Mailroom functions – All General Office Mail, provide forms availability to all districts
- Keeper of the brass keys for W-B reg. station locks
- P-Card Administration
- Voyager card administrator (liaise with MDU fleet)
- **Ensure SOX and company policy compliance**
- Vacation/Sick Coverage

Current Procurement Assistant responsibilities include:

- Central Stores replenishment ordering
- Docusphere – Vendor follow up

Administrative Services – Responsibilities

- PO Research and follow up – delivery follow up, partial deliveries, pricing, lead times, etc
- General Office meetings/events
- General Office facility requests
    - CNG wide fleet licensing
    - File order packets in vendor files (SOX compliance)
    - Coordination and assistance with gathering, maintenance and upkeep of the Certificates of Insurance file
    - GO Fleet – maintain service, scheduling and availability, cleanliness
    - Under direction of department manager – direct daily activities of mailroom (IKON)
    - P-Card and Voyager card inquiries
    - Assists with the records management and audit of all procurement functions for SOX compliance
    - Works in coordination with managers on the posting of fleet vehicles and equipment to the "Surplus" auction web site
        - Docusphere - No Receipt follow up (ALL)
        - Email POs to vendors
        - Assist manager with job materials quotes and subsequent ordering and follow up
        - Ensure costs on stocked items in JDE are current
        - Offsite storage day to day facilitation
        - Coordinate Qtrly and Annual compliance inspections in facility:
            - Extinguishers/Elevator/First Aid Kits/Oxygen/etc.
        - Employee badging
        - GO employee nameplate orders
        - Schedule pool cars for visitors (should be done through department being visited)
        - Airport shuttle
        - Coffee Service/Vending machine vendor – must be escorted when on site
        - Bank Deposits
        - Assist with physical inventory counts
        - As necessary – work to expedite materials, file claims for short/damaged materials. This is particularly time consuming during construction months.
        - Vacation/Sick Coverage

Payroll Load
(Based on Benefit Cost % of 2012 Payroll)

Holiday Pay	$	594,159.52
Vacation Pay	$	1,435,104.00
Company Sponsored Benefits	$	4,496,557.19
Employer Taxes	$	1,858,127.63
Total Benefits	**$**	**8,383,948.34**
Total Earnings (less Vacation & Holiday)	**$**	**18,434,905.05**
Percent of Total Earnings =		**45%**

Notes

Company Sponsored Benefits include premium payments for: Medical, Dental, Vision, Non-Contrib Life, LTD, Business AD&D, EAP, HSA, 401(k) Match, 401(k) ER Contribution, Pension

Employer Taxes include payments for: Social Security, Medicare, Workers Comp, Unemployment Insurance

Line No.			Oregon Allocation 24.30 %	Oregon Situs	
1	A+B	Sponsor/Conf/Training Totals:	$436,115.75	$202,780.30	$638,896.05
2	A	Charges w/ no descriptions	$266,477.48	$182,061.63	
3	B	Charges w/ descriptions	$169,638.27	$20,718.67	
			$436,115.75	**$202,780.30**	
4	A	Charges w/ no descriptions	$266,477.48	$182,061.63	
5		**Vehicle Time Entries Object Account 5400**	$47,770.66	$83,546.99	$131,317.65
6		**Located Support for Oregon Allocated Costs**	$199,570.89	$86,468.39	
7		**Total Amount of Support**	$247,341.55	$170,015.38	
8	A-1	**Difference**	19,135.93	12,046.25	
9	B	**Charges with Descriptions**			
10	B-1	Charges with Descriptions are not supported	$21,576.27	$8,154.43	
11	B-2	Charges with Descriptions That Are Supported	$149,277.00	$13,139.24	
12		Total	**$170,853.27**	**$21,293.67**	
13	C	**Additional Reductions**	$2,143.00	$8,497.76	
14	A-1+B-1+C	**All unsupported deductions**	**42,855.20**	**28,698.44**	**71,553.64**
15		**Suported**	**$393,260.55**	**$174,081.86**	
16		**% Supported for Recovery**	**90.17%**	**85.85%**	