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AGL UPSTREAM INVESTMENTS PTY LTD

CAMDEN GAS PROJECT

Annual Leak Detection and Repair Summary Report

Reporting Period: 22 December 2014 – 11 December 2015

AGL Upstream Investments Pty Ltd

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Foreword

PREMISES	Rosalind Park Gas Plant Lot 35 Medhurst Road GILEAD NSW 2560
LICENCE DETAILS	<u>Environment Protection Licence 12003</u>
LICENCEE	AGL Upstream Investments Pty Limited (AGL)
LICENCEE'S ADDRESS	Locked Bag 1837, North Sydney, NSW 2060
REPORTING PERIOD	22 December 2014 – 11 December 2015
REPORT DATE	11 December 2015
REPORT PREPARED BY	Aaron Clifton, Environment Manager

1. Introduction

1.1 Background

The Camden Gas Project (CGP) is owned and operated by AGL and is located in the Macarthur region 65 km southwest of Sydney, in the Wollondilly, Camden and Campbelltown Local Government Areas. The CGP has been producing gas for the Sydney region since 2001 and currently consists of 144 gas wells, low-pressure underground gas gathering pipes and the Rosalind Park Gas Plant (RPGP).

The Environment Protection Licence for the CGP (EPL 12003) includes requirements for the operation and reporting of a Leak Detection and Repair (LDAR) program.

This LDAR Summary Report has been prepared to satisfy the LDAR reporting requirements of the EPL.

1.2 EPL12003: Leak Detection and Repair Program

EPL 12003 includes the following requirements for Leak Detection and Repair:

- Condition M7.2: *The licensee must operate a Leak Detection and Repair Program for all relevant components of plant and equipment.*
- Condition M7.3: *The LDAR Program must, unless otherwise approved by the EPA, monitor for the detection of leaks in accordance with US EPA Method 21- Determination of Volatile Organic Compound Leaks (40 CFR Part 60, Appendix A, Method 21).*
- Condition R4.2: *The licensee must submit a brief summary report on the Leak Detection and Repair (LDAR) program with the annual return. The summary report must include, but may not be limited to:*
 - *The total number of components inspected, as well as the number and percentage of minor, major and significant leaking components found by component types;*
 - *The type of components and the scale of the leak for any equipment where leaks are found;*
 - *The emission level of leaking equipment and emission level of re-check after leak was repaired;*
 - *The repair responses and times as listed in Table 1.*

Table 1- Scale of leaks and classification

Scale of leak (ppmv)	Classification
1000-<10,000	Minor
>= 10,000 - <50,000	Major
>=50,000	Significant

- Condition R4.3: *Where a leak is identified, AGL should aim to have the component repaired as follows:*
 - *Within a period of 14 days if the concentration of the fugitive VOCs emission is greater than or equal to 1,000 parts per million by volume (ppmv) but not more than 10,000 ppmv (minor leak), as methane, above background .*
 - *Within a period of 5 days if the concentration of the fugitive VOCs emission is greater than or equal to 10,000 ppmv but not more than 50,000 ppmv (major leak), as methane, above background*
 - *Within a period of one day if the concentration of the fugitive VOCs emission is greater than or equal to 50,000 ppmv (significant leak > 50,000 ppmv), as methane, above background.*

1.3 Methodology

The LDAR program was undertaken at the CGP by independent third party specialists, Heath Pipeline Services Pty Ltd (HPS). The LDAR program was conducted over 17 days from 06 October 2015 to 07 December 2015, and assessed 128 wellheads, associated above ground facilities and gas gathering lines, and RPGP vessels and piping.

The LDAR program was undertaken in accordance with US EPA Method 21 – Determination of Volatile Organic Compound Leaks (40 CFR Part 60, Appendix A, Method 21).

The LDAR program was undertaken using a GMI leak surveyor operating at 1 part per million (ppm) sensitivity level.

2. LDAR Program Results

2.1 Field

The results of the LDAR program for the Camden field (including wellheads and associated above ground facilities and infrastructure, and gas gathering lines) are provided in **Table 2**.

Table 2- Leak detection results for the Camden field LDAR program

Component		Detected Leaks					
		Minor		Major		Significant	
Type	No.	Total	%	Total	%	Total	%
Wells (including valves, instrumentation, vessels, flanges, pipe threads and well heads)	14,049	19	0.13	10	0.07	0	0
Gas gathering line (km)	80.72	0	-	0	-	1	-

Where leaks were identified during the field LDAR program, the scale, emission level (pre and post repair), and the repair response and response times were recorded and are summarised in **Table 3**.

Table 3- Camden field LDAR program repair response

Equipment	Component	Leak Scale	Repair Response	Repair Time	Pre Repair (ppmv methane)	Post Repair (ppmv methane)
Well - EM12	Instrumentation	Minor	Replaced instrumentation	Same day	2,930	<1
Well - EM31	Instrumentation	Minor	Removed, resealed and reinstalled fitting	Same day	1,950	<1
Well - EM37	Instrumentation	Minor	Removed, retaped and reinstalled gauge	Same day	3,200	<1
Well - EM39	Valve	Minor	Removed cap, regreased and reinstalled	Same day	5,320	<1
Well - GL08	Valve	Minor	Replaced water trap	3 days	2,740	<1
Well - GL10	Pipe thread	Minor	Removed, resealed and reinstalled fitting	2 days	2,520	<1
Well - GL12	Valve	Major	Replaced water trap	2 days	14,500	<1

Equipment	Component	Leak Scale	Repair Response	Repair Time	Pre Repair (ppmv methane)	Post Repair (ppmv methane)
Well - GL13	Instrumentation	Major	Removed, resealed and reinstalled fitting	2 days	22,500	<1
Well - GL15	Instrumentation	Minor	Removed, resealed and reinstalled fitting	2 days	3,100	<1
Well - JS03	Valve	Minor	Regreased valve seal	1 day	1,010	<5
Well - KP01	Instrumentation	Minor	Replaced instrumentation	Same day	1,620	<1
Well - LB10	Valve	Major	Replaced water trap	Same day	19,000	<1
Gas gathering line	Low water trap	Significant	Removed low water trap	1 day	60,000	<1
Well - MP02	Instrumentation	Minor	Retightened bolts	1 day	3,500	<1
Well - MP02	Fuel line fitting	Minor	Replaced fitting	1 day	4,650	<1
Well - MP03	Instrumentation	Major	Retightened bolts	1 day	32,500	<1
Well - MP09	Instrumentation	Major	Retightened bolts	1 day	17,000	<1
Well - MP12	Valve	Major	Removed cleaned and resealed fitting	Same day	22,500	<1
Well - MP14	Instrumentation	Minor	Cleaned and resealed fitting	Same day	4,250	<1
Well - MP30	Valve	Major	Cleaned and resealed valve	Same day	17,000	<1
Well - MT09	Gauge	Minor	Cleaned and resealed gauge	Same day	2,640	<1
Well - RB06	Stuffing box	Minor	Regrease stuffing box	Same day	1,980	<1
Well - RB06	Valve	Minor	Cleaned and resealed fitting	Same day	1,170	<1
Well - RB08	Stuffing box	Minor	Regrease stuffing box	Same day	3,900	<1
Well - RP09	Pipe thread	Major	Cleaned and resealed thread	1 day	12,000	<1
Well - RP10	Pipe thread	Minor	Cleaned and resealed thread	1 day	1,720	<1
Well - SF01	Instrumentation	Major	Replaced instrumentation	3 days	32,500	<1

Equipment	Component	Leak Scale	Repair Response	Repair Time	Pre Repair (ppmv methane)	Post Repair (ppmv methane)
Well - SF02	Pipe thread	Major	Cleaned and resealed thread	3 days	17,500	<1
Well - SF08	Instrumentation	Minor	Replaced instrumentation	3 days	1,380	<1
Well - WG03	Valve	Minor	Replaced water trap	Same day	1,360	<1

2.2 RGP

The results of the LDAR program for RGP (including valves, vessels, instrumentation, piping and compressors) are provided in **Table 4**.

Table 4 – Leak detection results for the RGP LDAR program

Component		Detected Leaks					
		Minor		Major		Significant	
Type	No.	Total	%	Total	%	Total	%
RGP (including valves, vessels, instrumentation, piping and compressors)	6,095	7	0.1	1	0.02	2	0.03

Where leaks were identified during the RGP LDAR program, the scale, emission level (pre and post repair), and the repair response and response times were recorded and are summarised in **Table 5**.

Table 5- Rosalind Park Gas Plant LDAR program repair response

Equipment	Component	Leak Scale	Repair Response	Repair Time	Pre Repair (ppmv methane)	Post Repair (ppmv methane)
Pipe Rack	Valve	Significant	Replaced valve and nipple	Same day	170,000	<1
Pipe Rack	Instrumentation	Minor	Removed, resealed and reinstalled gauge	Same day	1,860	<1
Flare Pilot Skid	Gauge	Major	Resealed and tightened gauge	Same day	43,000	<1
TEG Skid	Gauge	Minor	Resealed and tightened gauge	Same day	2,490	<1

Equipment	Component	Leak Scale	Repair Response	Repair Time	Pre Repair (ppmv methane)	Post Repair (ppmv methane)
Meter Gas Skid	Instrumentation	Minor	Tightened fitting	Same day	2,880	<1
Discharge Scrubber V301	Pipe thread	Minor	Tightened fitting	Same day	1,280	<1
Compressor #2	Pipe thread	Minor	Tightened fitting	5 days	3,120	<1
Compressor #2	Carburettor	Minor	Replaced seals	5 days	2,510	<1
Compressor #2 outlet	Instrumentation	Minor	Replaced instrumentation	5 days	4,890	<1
Compressor #3	Valve	Significant	Tightened fitting	Same day	210,000	<1

3 Conclusion

The LDAR program was implemented at the CGP and included an assessment of field and RGP facilities and infrastructure.

The LDAR program was undertaken by third party leak detection specialists in accordance with US EPA Method 21 – Determination of Volatile Organic Compound Leaks (40 CFR Part 60, Appendix A, Method 21).

Leaks that were identified during the LDAR program were classified in accordance with methane emission levels and repairs were undertaken within the target period recommended in EPL 12003.

4 References

1. Gas Leakage Report - Camden Gas Project, Heath Pipeline Services, 09 December 2015.