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The AGL logo is a blue square with a white sunburst icon to the left of the letters "AGL" in white.

**AGL UPSTREAM INVESTMENTS PTY LTD  
ROSALIND PARK GAS PLANT  
Quarterly Air Monitoring Report**

Reporting Period: 3<sup>rd</sup> Quarter – September 2013

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# Foreword

|                           |  |
|---------------------------|--|
| <b>PREMISES</b>           | Rosalind Park Gas Plant<br>Lot 35 Medhurst Road<br>GILEAD NSW 2560 |
| <b>LICENCE DETAILS</b>    | <a href="#">Environment Protection Licence 12003</a>               |
| <b>LICENCEE</b>           | AGL Upstream Investments Pty Limited                               |
| <b>LICENCEE'S ADDRESS</b> | Locked Bag 1837, North Sydney, NSW 2060                            |
| <b>MONITORING DATE</b>    | 3 <sup>rd</sup> Quarter – 20, 23-26 September 2013                 |
| <b>MONITORING BY</b>      | Emission Testing Consultants (Report 130580r, 21 November 2013)    |
| <b>REPORT DATE</b>        | 22 November 2013   |
| <b>REPORT PREPARED BY</b> | Aaron Clifton<br>Environmental Manager                             |

## SUMMARY OF ACTIVITY

Rosalind Park Gas Plant, located approximately 60km south west of Sydney, is a natural gas processing and treatment plant, used to process coal seam natural gas from the Camden Gas Project.

Produced natural gas is cleaned, dehydrated, compressed and odourised before being measured and transported by pipeline about 500 metres into the nearby Moomba to Sydney Natural Gas Pipeline. The premises covered by this Environment Protection Licence also includes all gas wells, gas gathering, reticulation systems, trunk lines and associated effluent storage areas and work areas of the Camden Gas Project.

This Monitoring Report relates to those air monitoring activities specified in Part 5, Monitoring and Recording Conditions, of the Environment Protection Licence. The Licence



conditions stipulate air monitoring is required to be carried out at the locations, at the frequency and using the test methods as set out in the tables below.

This report sets out the results of quarterly monitoring. A separate report is issued for continuous monitoring.

This report is prepared in accordance with the *Requirements for Publishing Pollution Monitoring Data* (EPA, March 2012) (**Publication Requirements**).

## AIR MONITORING LOCATIONS

| Point | Location                                | Monitoring Frequency |
|-------|---|----------------------|
| 1     | Exhaust Stack 1 on Compression Engine 1 | Quarterly            |
| 2     | Exhaust Stack 2 on Compression Engine 2 | Quarterly            |
| 3     | Exhaust Stack 3 on Compression Engine 3 | Quarterly            |
| 4     | Reboiler Flue                           | Quarterly            |
| 5     | Reflux Column Vent                      | Quarterly            |
| 6     | Carbon Scrubber Vent                    | Quarterly            |

## AIR MONITORING TEST METHODS – POINTS 1, 2, 3, 4, 5

| Parameter   | NSW EPA Test Method (Sampling Method) |
|---|---------------------------------------|
| Carbon dioxide  | TM-24                                 |
| Dry gas density   | TM-23                                 |
| Moisture  | TM-22                                 |
| Molecular weight of stack gases                               | TM-23                                 |
| Nitrogen Oxides   | TM-11                                 |
| Oxygen (O <sub>2</sub> )                                      | TM-25                                 |
| Sulfuric acid mist and sulphur trioxide (as SO <sub>3</sub> ) | TM-3                                  |
| Sulphur dioxide   | TM-4                                  |
| Temperature   | TM-2                                  |



|                     |      |
|---------------------|------|
| Velocity            | TM-2 |
| Volumetric flowrate | TM-2 |

## AIR MONITORING TEST METHODS – POINT 6

| Parameter                       | NSW EPA Test Method (Sampling Method) |
|---------------------------------|---------------------------------------|
| Carbon dioxide                  | TM-24                                 |
| Dry gas density                 | TM-23                                 |
| Moisture                        | TM-22                                 |
| Molecular weight of stack gases | TM-23                                 |
| Odour                           | OM-7                                  |
| Oxygen (O <sub>2</sub> )        | TM-25                                 |
| Temperature                     | TM-2                                  |
| Velocity                        | TM-2                                  |
| Volumetric flowrate             | TM-2                                  |

In relation to sampling for sulphur dioxide in respect of EPL 12003, section M2 of the licence designates TM-4 (USEPA 6 non-isokinetic "midget impinger" method) as the appropriate method for sampling.

ETC has conducted sampling in compliance with TM-3 (USEPA 8). USEPA 8 and USEPA 6 are both approved methods for sampling sulphur dioxide within NSW.

USEPA 8 embodies the principles of USEPA 6 however also provides for the concurrent sampling of sulphur trioxide. The principles of sampling are the same except sampling pursuant to USEPA 8 is conducted isokinetically and utilises larger impingers. Accordingly USEPA 8 is effectively considered an extension and improvement of USEPA 6.



## Air Monitoring Results

| Monitoring Point | Description         | Pollutant  | Units of measure           | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|---------------------|--|----------------------------|-------------------|-----------------|--|---------------|---------------------|
| 1                | Compressor Engine 1 | Carbon dioxide                                   | Percent                    |                   | TM-24           | Quarterly                                | 4.5           |                     |
|                  |                     | Dry gas density                                  | Kilograms per cubic metre  |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |                     | Moisture   | Percent                    |                   | TM-22           | Quarterly                                | 7.8           |                     |
|                  |                     | Molecular weight of stack gases                  | Grams per gram mole        |                   | TM-23           | Quarterly                                | 29            |                     |
|                  |                     | Nitrogen Oxides                                  | Milligrams per cubic metre | 7% oxygen         | TM-11           | Quarterly                                | 280           | 461                 |
|                  |                     | Oxygen (O2)                                      | Percent                    |                   | TM-25           | Quarterly                                | 12.9          |                     |
|                  |                     | Sulfuric acid mist and sulphur trioxide (as SO3) | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | 0.54          | 5.0                 |
|                  |                     | Sulphur dioxide                                  | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | 2.6           | 7                   |
|                  |                     | Temperature                                      | Degrees Celsius            |                   | TM-2            | Quarterly                                | 332           |                     |
|                  |                     | Velocity   | Metres per second          |                   | TM-2            | Quarterly                                | 25            |                     |
|                  |                     | Volumetric flowrate                              | Cubic metres per second    |                   | TM-2            | Quarterly                                | 3.0           |                     |



| Monitoring Point | Description         | Pollutant  | Units of measure           | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|---------------------|--|----------------------------|-------------------|-----------------|--|---------------|---------------------|
| 2                | Compressor Engine 2 | Carbon dioxide                                   | Percent                    |                   | TM-24           | Quarterly                                | 11.4          |                     |
|                  |                     | Dry gas density                                  | Kilograms per cubic metre  |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |                     | Moisture   | Percent                    |                   | TM-22           | Quarterly                                | 21            |                     |
|                  |                     | Molecular weight of stack gases                  | Grams per gram mole        |                   | TM-23           | Quarterly                                | 30            |                     |
|                  |                     | Nitrogen Oxides                                  | Milligrams per cubic metre | 7% oxygen         | TM-11           | Quarterly                                | 220           | 461                 |
|                  |                     | Oxygen (O2)                                      | Percent                    |                   | TM-25           | Quarterly                                | 0.39          |                     |
|                  |                     | Sulfuric acid mist and sulphur trioxide (as SO3) | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.5          | 5.0                 |
|                  |                     | Sulphur dioxide                                  | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.1          | 7                   |
|                  |                     | Temperature                                      | Degrees Celsius            |                   | TM-2            | Quarterly                                | 432           |                     |
|                  |                     | Velocity   | Metres per second          |                   | TM-2            | Quarterly                                | 20            |                     |
|                  |                     | Volumetric flowrate                              | Cubic metres per second    |                   | TM-2            | Quarterly                                | 0.72          |                     |



| Monitoring Point | Description         | Pollutant  | Units of measure           | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|---------------------|--|----------------------------|-------------------|-----------------|--|---------------|---------------------|
| 3                | Compressor Engine 3 | Carbon dioxide                                   | Percent                    |                   | TM-24           | Quarterly                                | 11.4          |                     |
|                  |                     | Dry gas density                                  | Kilograms per cubic metre  |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |                     | Moisture   | Percent                    |                   | TM-22           | Quarterly                                | 19            |                     |
|                  |                     | Molecular weight of stack gases                  | Grams per gram mole        |                   | TM-23           | Quarterly                                | 30            |                     |
|                  |                     | Nitrogen Oxides                                  | Milligrams per cubic metre | 7% oxygen         | TM-11           | Quarterly                                | 86            | 461                 |
|                  |                     | Oxygen (O2)                                      | Percent                    |                   | TM-25           | Quarterly                                | 0.47          |                     |
|                  |                     | Sulfuric acid mist and sulphur trioxide (as SO3) | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.5          | 5.0                 |
|                  |                     | Sulphur dioxide                                  | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.1          | 7                   |
|                  |                     | Temperature                                      | Degrees Celsius            |                   | TM-2            | Quarterly                                | 439           |                     |
|                  |                     | Velocity   | Metres per second          |                   | TM-2            | Quarterly                                | 20            |                     |
|                  |                     | Volumetric flowrate                              | Cubic metres per second    |                   | TM-2            | Quarterly                                | 0.71          |                     |



| Monitoring Point | Description   | Pollutant  | Units of measure           | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|---------------|--|----------------------------|-------------------|-----------------|--|---------------|---------------------|
| 4                | Reboiler Flue | Carbon dioxide                                   | Percent                    |                   | TM-24           | Quarterly                                | 4.5           |                     |
|                  |               | Dry gas density                                  | Kilograms per cubic metre  |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |               | Moisture   | Percent                    |                   | TM-22           | Quarterly                                | 10            |                     |
|                  |               | Molecular weight of stack gases                  | Grams per gram mole        |                   | TM-23           | Quarterly                                | 29            |                     |
|                  |               | Nitrogen Oxides                                  | Milligrams per cubic metre | 7% oxygen         | TM-11           | Quarterly                                | 100           | 110                 |
|                  |               | Oxygen (O2)                                      | Percent                    |                   | TM-25           | Quarterly                                | 12.9          |                     |
|                  |               | Sulfuric acid mist and sulphur trioxide (as SO3) | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.6          | 3.5                 |
|                  |               | Sulphur dioxide                                  | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.1          | 35                  |
|                  |               | Temperature                                      | Degrees Celsius            |                   | TM-2            | Quarterly                                | 301           |                     |
|                  |               | Velocity   | Metres per second          |                   | TM-2            | Quarterly                                | 3.4           |                     |
|                  |               | Volumetric flowrate                              | Cubic metres per second    |                   | TM-2            | Quarterly                                | 0.076         |                     |



| Monitoring Point | Description        | Pollutant  | Units of measure           | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|--------------------|--|----------------------------|-------------------|-----------------|--|---------------|---------------------|
| 5                | Reflux Column Vent | Carbon dioxide                                   | Percent                    |                   | TM-24           | Quarterly                                | 12.5          |                     |
|                  |                    | Dry gas density                                  | Kilograms per cubic metre  |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |                    | Moisture   | Percent                    |                   | TM-22           | Quarterly                                | 74            |                     |
|                  |                    | Molecular weight of stack gases                  | Grams per gram mole        |                   | TM-23           | Quarterly                                | 30            |                     |
|                  |                    | Nitrogen Oxides                                  | Milligrams per cubic metre | 7% oxygen         | TM-11           | Quarterly                                | <3            | 13                  |
|                  |                    | Oxygen (O2)                                      | Percent                    |                   | TM-25           | Quarterly                                | 0.92          |                     |
|                  |                    | Sulfuric acid mist and sulphur trioxide (as SO3) | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <4            | 35                  |
|                  |                    | Sulphur dioxide                                  | Milligrams per cubic metre |                   | TM-3            | Quarterly                                | <0.5          | 1042                |
|                  |                    | Temperature                                      | Degrees Celsius            |                   | TM-2            | Quarterly                                | 91            |                     |
|                  |                    | Velocity   | Metres per second          |                   | TM-2            | Quarterly                                | <2            |                     |
|                  |                    | Volumetric flowrate                              | Cubic metres per second    |                   | TM-2            | Quarterly                                | <0.003        |                     |

The selection of the sampling position for quarterly monitoring at point 5 was not carried out in accordance with test method TM-1 as specified in the "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, 2000" (**Approved Methods**). The Approved Methods provides that in relation to TM-1, the selection of sampling positions should be assessed in accordance with "AS 4323.1 - 1995 Stationary Source Emissions Method 1: Selection of Sampling Positions" (**AS-4323.1**).

AS 4323.1 requires that the location of the sampling plane must meet relevant criteria, including that the gas velocity at all sampling points be greater than 3m/s. At the time of sampling, because of the very low flow rate emitted at this point, it is not possible to meet the gas velocity threshold of greater than 3m/s. EPL 12003 has since been varied and Condition M2.6 now excludes gas velocity at point 5 for the purposes of TM-1.



| Monitoring Point | Description          | Pollutant                       | Units of measure          | Oxygen correction | Sampling method | Monitoring frequency required by licence | Concentration | Concentration limit |
|------------------|----------------------|---------------------------------|---------------------------|-------------------|-----------------|--|---------------|---------------------|
| 6                | Carbon Scrubber Vent | Carbon dioxide                  | Percent                   |                   | TM-24           | Quarterly                                | <0.3          |                     |
|                  |                      | Dry gas density                 | Kilograms per cubic metre |                   | TM-23           | Quarterly                                | 1.3           |                     |
|                  |                      | Moisture                        | Percent                   |                   | TM-22           | Quarterly                                | 3.6           |                     |
|                  |                      | Molecular weight of stack gases | Grams per gram mole       |                   | TM-23           | Quarterly                                | 29            |                     |
|                  |                      | Odour                           | Odour Units               |                   | OM-7            | Quarterly                                | 49            |                     |
|                  |                      | Oxygen (O2)                     | Percent                   |                   | TM-25           | Quarterly                                | 20.9          |                     |
|                  |                      | Temperature                     | Degrees Celsius           |                   | TM-2            | Quarterly                                | 30            |                     |
|                  |                      | Velocity                        | Metres per second         |                   | TM-2            | Quarterly                                | 5.1           |                     |
|                  |                      | Volumetric flowrate             | Cubic metres per second   |                   | TM-2            | Quarterly                                | 0.12          |                     |