# 15 REHABILITATION AND DECOMMISSIONING

## 15.1 INTRODUCTION

The Project description for the Gas Field Component, as described in the draft EIS, was based on best available, conceptual information prior to detailed Front End Engineering and Design (FEED). At the time of preparation of the supplementary EIS, the Project description had been further refined as a result of the progression of engineering design and option selection processes.

This chapter describes any supplementary information available on the Gas Field rehabilitation and decommissioning. In addition, any submissions received that relate to the description of Gas Field rehabilitation and decommissioning are addressed in this chapter.

## 15.2 SUBMISSIONS RECEIVED

*Table 2.15.1* provides a summary of the submissions received on rehabilitation and decommissioning of the Gas Field and a response to those submissions.

### Table 2.15.1 Responses to Submissions on the Draft EIS

| Issue raised | QCLNG Response | Relevant Submission(s) |
|---|---|---|
| Ponds should not be used to take overland flow post the project, unless in accordance with the Fitzroy Water Resources Plan. | Ponds will not be used for the taking of overland flows as they will be four walled structures that divert overland flows around the outside of the ponds. All ponds will be decommissioned post the Project, unless agreed with the landholder and in compliance with the Fitzroy Water Resources Plan. | 32 |

## 15.3 SUPPLEMENTARY INFORMATION ON REHABILITATION AND DECOMMISSIONING

Decommissioning and rehabilitation is described in *Volume 2, Chapter 15* of the draft EIS. This chapter provides additional information on aspects of rehabilitation and decommissioning described in the draft EIS. In addition, estimates of the disturbance from Gas Field development, before and after progressive rehabilitation are presented.

### 15.3.1 Ponds Decommissioning

QGC will develop a Pond Decommissioning Plan for all ponds including the development and application of the following pond decommissioning guidelines.

- The pond will be dewatered by pumping water to another water storage

pond or to the WTP. After the pond has been dewatered for decommissioning, there will be no more driving head to spread any saline seepage further in the horizontal plane. Without the driving head, the horizontal flow will rapidly cease.

- Clay liners, geosynthetic liners and any contaminated soils will be either gathered at a high point in the pond footprint or transferred to another pond that is scheduled for decommissioning in the future. This will reduce the footprint of contaminated materials within each pond.
- Pond embankments will be leveled and material used to cover the pond floor. This will ensure that the pond no longer impounds any water.
- Diversion drains that surrounded the pond may be retained to divert any runoff from the decommissioned pond area.
- A capillary break layer will be installed over the pond footprint to prevent capillary rise of salts into any soil cover.
- A clay layer will be installed over the capillary break layer to minimize seepage from rainfall and runoff. It is expected that this would have a minimum thickness of 0.3 m.
- A growth medium / topsoil will be installed over the clay layer in a convex shape to prevent pooling of rainfall and runoff. It is expected that this would have a minimum thickness of 0.1 m.
- The growth medium will be planted with species suited to the local climate and which will not grow roots deep enough to penetrate the clay or capillary break layers. These species will take up water from the growth medium and minimise the volume of water seeping into the clay or capillary break layers.

QGC has undertaken modelling for the decommissioning of an existing evaporation pond and that modeling indicates that, after the pond is dewatered, the driving head for seepage will be removed and the migration rate of any seepage bulb will slow and stop in underlying and adjacent unsaturated extremely weathered rock strata. This and the retained very low hydraulic conductivity of the underlying unsaturated strata should limit the possibility of vertical flow of saline water downwards to deeper aquifers after decommissioning.

Where monitoring during the life of the pond indicates the potential for soils and aquifer contamination post decommissioning, an ongoing monitoring plan will be implemented. There is the potential that any shallow monitoring wells, that existed prior to decommissioning, will be removed during the decommissioning process. However these will be replaced by a network of shallow monitoring wells in surficial soils around the site of the decommissioned pond. Deep monitoring bores will not be removed during decommissioning and will continue to provide data on aquifer water quality following decommissioning.

All decommissioned ponds will be subject to routine monitoring of erosion and vegetation around the pond, including vegetation established during the

decommissioning process, for any evidence of vegetation scalding or die back due to migration of salts.

QGC will continue monitoring shallow bores, deep bores, soils and vegetation surrounding ponds for a period agreed with regulatory authorities or until there is no evidence of seepage of saline materials.

Pond decommissioning will be an ongoing process. Initially existing exploration ponds (constructed under current petroleum licenses) may be decommissioned and lessons learned will guide strategies and approaches for decommissioning the ponds proposed for the QCLNG Project. QGC will investigate options for pond decommissioning. These options include:

- capping and containing contaminated soils on site
- transferring contaminated soils and liners to a purpose-built secure landfill which could include the salt disposal landfill
- recycling and reuse of geosynthetic materials.

Saline material and liners could be removed to a landfill. The pond site could be rehabilitated using material from pond walls and by creating a capping layer to reduce infiltration of surface water into the subsoils with higher saline concentrations. This option could require transporting some contaminated material to a landfill. Dependent on the amount of material removed, some in-situ material may remain with elevated salt, above pre-pond use levels. Long term monitoring and management may be required.

### *15.3.2 Salt Disposal Landfills Decommissioning*

A closure plan and a post closure plan will be developed for the salt landfill. QGC will be the entity responsible for the long-term management of any landfills. Management would be required, in agreement with the relevant regulatory authority, until such time as the landfill no longer poses a risk of soils or water contamination. QGC will supply the necessary financial assurance to ensure that any landfill can be successfully decommissioned beyond QGC's operating duration. QGC may employ a contractor to manage the landfill. The post closure plan to be developed for the landfill will identify who would be responsible for managing the landfill and the length of time of the management. Additional information on the design, construction and operation of a salt disposal landfill is provided in *Volume 3, Chapter 6* of the supplementary EIS.

### *15.3.3 Progressive Rehabilitation*

An area is considered to be progressively rehabilitated once it has substantially achieved its pre-disturbance condition. For areas with permanent above ground infrastructure, such as FCSs and CPPs, there will be little or no progressive rehabilitation. However some of the area disturbed by development of well pads, pipeline easements and access tracks can be progressively rehabilitated. *Table 2.15.2* shows the estimated maximum area of disturbance by infrastructure type and the estimated area of disturbance

following progressive rehabilitation over the life of the Project for the draft EIS and sEIS.

***Table 2.15.2 Disturbance Before and After Progressive Rehabilitation***

| Activity/ Infrastructure | Draft EIS – Disturbance Area (ha) | | sEIS Disturbance Area (ha) | |
|---|---|---|---|---|
| | Before rehabilitation | After rehabilitation | Before rehabilitation | After rehabilitation |
| Gas Wells | 6,000 | 3,000 | 6,000 | 3,000 |
| Borrow Pits | Independent supplier | n/a | 420 | 0 |
| Gas/Water Gathering Line Easements | 3,750 | 750 | 15,600 | 6,800 |
| Gas and Water Trunklines (including power transmission) | 3,600 | 720 | 1,600 | 550 |
| Gas Collection Laterals | 400 | 80 | 0 | 0 |
| FCSs and CPPs | 200 | 200 | 500 | 500 |
| Water Treatment Plants | 24 | 24 | 75 | 75 |
| Ponds, including brine ponds and brine evaporation basins | 250 | 250 | 665 | 665 |
| Salt landfill | Not specified | Not specified | 50 | 50 |
| Access Tracks | 800 | 720 | 1,600 | 1,440 |
| Construction Camps | 65 | 15 | 250 | 60 |
| **Total Area** | **15,089** | **5,759** | **26,760** | **13,140** |
| **Percentage of Gas Field[1]** | **3.2per cent** | **1.2 per cent** | **5.7 per cent** | **2.8 per cent** |

1 – Based on a total Gas Field tenement area of 468,700 ha.

The total estimated footprint before progressive rehabilitation has increased by approximately 11,700 ha (or 77 per cent), from 15,100 ha (draft EIS) to 26,800 ha (sEIS). This represents an increase from 3.2 per cent to 5.7 per cent of the total tenement area of the Gas Field. Progressive rehabilitation will reduce the construction footprint from an estimated 26,800 ha to 13,200 ha. Compared to the draft EIS, the footprint following progressive rehabilitation will have increased by approximately 7,400 ha, from approximately 5,800 ha (1.2 per cent of the Gas Field) to approximately 13,200 ha (2.8 per cent of the Gas Field).

The majority of the increase from the draft EIS to the sEIS is as a result of the larger easement footprint for the gas and water gathering line, from approximately 3,750 ha to 15,600 ha. However, gathering line easements will be progressively rehabilitated once the pipelines are installed, reducing the footprint to approximately 6,800 ha. Access tracks will be required along easements for maintenance purposes and deep-rooted vegetation will not be allowed to grow above pipelines. These areas whilst stabilised and vegetated, are not considered to be progressively rehabilitated. The majority of pipeline easements will pass through land used for pastoral activities and this land will be returned to its pre-disturbance condition, such that the easement, other than any remaining access tracks, is suitable for pastoral activities.

Each of the 6,000 wells will occupy an estimated hardstand lease area of one hectare, required for well drilling, before progressive rehabilitation of the well establishment area. Following rehabilitation, each well lease area will occupy approximately 0.5 ha.