



Risk Profile and Assessment Criteria for Earth Dams used for Commercial Aquaculture Production in the Griffith Local Government Area CS-CP- 406 (LOCAL POLICY)

1 Policy History

Revision No.	Council Meeting Date	Minute No.	Adoption Date
1	10/06/2014	0191	10/06/2014
2	22/08/2017	17/205	22/08/2017
3	23/08/2022	22/209	23/08/2022

2 Policy Objective

To establish appropriate criteria for assessing development proposals for commercial aquaculture production in existing or new earth dams in the Griffith Local Government Area.

3 Policy Statement

3.1 Purpose

Whilst farm dams less than 15 ML can be constructed for water storage purposes without development consent and dams greater than 15 ML with consent, their use for commercial aquaculture creates a greater risk of potential groundwater contamination because of the quantities of feed of unknown composition, excreta, detritus and the possible presence of other organic and inorganic contaminants such as antibiotics, growth stimulants and heavy metals. Should contamination occur, there may be impacts on other groundwater users and the environment by way of water sources connected to groundwater, as well as salinity migration.

It is therefore reasonable to assess the risk of groundwater contamination when proposals for aquaculture production are being considered, and should a risk be determined, to require certain mitigation actions.

The level of risk (from level 0, low risk, to level 2, high risk) determines the risk mitigation requirements. It is also the case that some proposals will seek to use existing farm dams and others will be constructing new dams, thereby justifying a differential approach to risk assessment and management.

3.2 Scope

This procedure applies to unlined earth dams used for commercial aquaculture production and not aquaculture production in sealed tanks or ponds.

Aquaculture takes a broad definition to include all species.

Commercial production is defined as that requiring a licence or permit from another Agency, including but not limited to permits issued under Part 2(4) of the Fisheries Management (Aquaculture) Regulation 2017.

“Extensive” and “Intensive” aquaculture are as defined in Part 1(3) Definitions of the Fisheries Management (Aquaculture) Regulation 2017.

The various maps referred to in assessing the Risk Profile are those contained in Griffith City Council Local Environment Plan 2014.

Flood prone land is that defined by any Flood Study adopted by Council or draft Flood Study that has been exhibited.

Earth dams can be excavated earth tanks where the high water level is lower than or the same as the natural surface, or those where excavated earth is used to construct an embankment designed so that the high water level is above natural surface. For the former, the separation distances defined in the Risk Profile are measured from the high water level. For the latter, the separation distances defined in the Risk Profile are measured from the outside toe of the earth bank. See Figures 1 and 2.

Most earth dams are likely to exhibit small seepage rates. For the purpose of these procedures, a negligible seepage rate net of inflows and evaporation is defined as less than 3.5 mm per day change in water depth when the dam is near full.

Figure 1 – Excavated earth tank

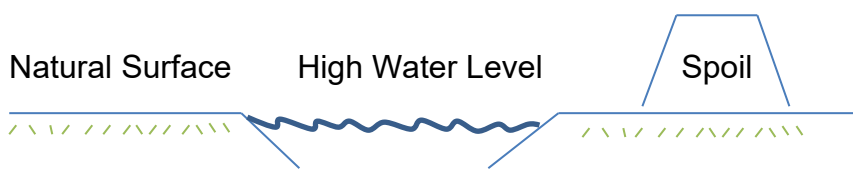
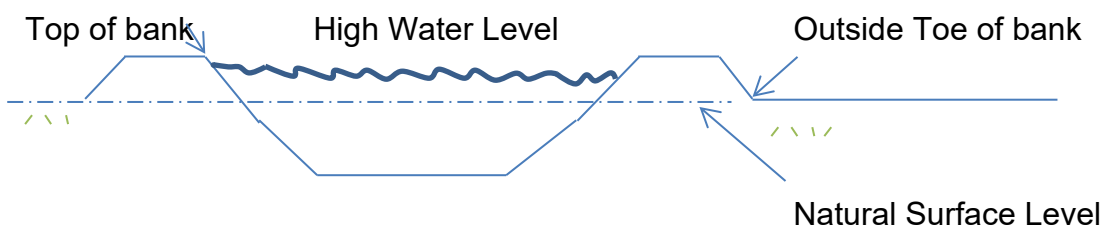


Figure 2 – Earth dam with compacted embankment



3.3 Risk Profile for commercial aquaculture production in earth dams

Level 2

- Dam located within Groundwater Vulnerability Map, or
- Dam located less than 20m from an area identified in Wetlands Map, or
- Dam located less than 20m from an area identified in Riparian Lands and Watercourses Map, or
- Dam located on flood prone land, or
- Dam located less than 100m from an existing stock and domestic groundwater well or bore, or
- Result following application of the Simple Water Balance Model to existing dams (see Risk Mitigation Measures) for 14 days is not negligible.

Level 1

- Dam located less than 20m from property boundary, or
- Dam located less than 20m from a water supply channel other than a terminal channel used to supply the dam, or
- Insufficient clay content in the earth at the dam location, as demonstrated by the field assessment of soil texture known as the “ribbon test”, or
- Visual evidence or evidence from simple field tests of unstable soil such as dispersion, slumping, slaking, rilling or erosion, or
- For existing dams, visual evidence of existing water ponding or seepage on or adjacent to the exterior of the embankment

Level 0

None of the above

3.4 Risk Mitigation Measures for Commercial Aquaculture Production in Earth Dams

Risk Profile	Existing earth dams	New earth dams	
		Extensive aquaculture	Intensive aquaculture
Level 0	No measures required	Construction of dam by competent and experienced operator.	Geotechnical report required to determine construction method, and Construction of dam in accordance with the geotechnical report by competent and experienced operator.
Level 1	Simple Water Balance Model applied for 14 days	Geotechnical report required to determine construction method, and Construction of dam in accordance with the geotechnical report by a competent and experienced operator.	Geotechnical report required to determine construction method, and Construction of dam by competent and experienced operator, and Geotechnical certification that dam constructed in accordance with report.
Level 2	Superior Water Balance Model applied for 56 days	Geotechnical report required to determine construction method, and Construction of dam by competent and experienced operator, and Geotechnical certification that dam constructed in accordance with report.	Geotechnical report required to determine construction method, and Construction of dam by competent and experienced operator, and Geotechnical certification that dam constructed in accordance with report.

3.5 Water Balance Model used to measure water seepage rates

Seepage Rate (mm/day) = change in water level when dam near full (mm) + rainfall (mm, based on 'top of bank' surface area) + inflows (converted to mm) – evaporation (mm)

Simple Water Balance Model:

- Change in water level measured from temporary peg
- Rainfall measured by on site rain gauge
- Survey of top of bank and high water level required to calculate rainfall and inflow effects
- Evaporation assumed from Bureau of Meteorology published data
- 14 day duration of measurements

Superior Water Balance Model:

- Change in water level measured from within a still water chamber
- On site weather station for rainfall and evaporation measurements
- Survey of top of bank and high water level required to calculate rainfall and inflow effects
- 56 day duration of measurements
- Independent verification of measurements
- May also require piezometer installation and measurements

3.6 Other considerations

Existing dams with a Risk Profile of Level 1 or Level 2 will not be approved for commercial aquaculture production if seepage rates are above negligible.

Treatments are available to reduce seepage rates (imported clay; scarifying and re-compaction; incorporation of flocculating materials; impermeable membrane liners) and approval will be reconsidered if treatment results in a negligible seepage rate.

Griffith City Council strongly recommends a pre-DA lodgement meeting for aquaculture projects.

1. Rowland, S.J. (n.d.), Site Selection and Design for Aquaculture, NSW Department of Primary Industries (available from the Department web site).
2. Regulation 4 of the Fisheries Management (Aquaculture) Regulation 2017.
3. Regulation 3 of the Fisheries Management (Aquaculture) Regulation 2017.
4. Griffith Local Environment Plan 2014.
5. Various Griffith City Council Flood Studies.

4 Definitions

None

5 Exceptions

None

6 Legislation

None

7 Related Documents

None

8 Directorate

Sustainable Development