ABN 98 117 085 748

Our Reference:
Your Reference: CMS17696

27 November 2019

Environmental Protection Authority
Prime House
8 Davidson Terrace
Joondalup Western Australia 6027

FOR ATTENTION: MS JESSICA BURTON

Dear Jessica,

RE: LAKE WAY SULPHATE OF POTASH PROJECT (CMS17696) ADDITIONAL INFORMATION TO SUPPORT REFERRAL APPLICATION

Further to your email correspondence dated 6th November 2019, Salt Lake Potash (SO4) provides the following reports containing additional information relevant to the Lake Way Sulphate of Potash project (CSM17696):

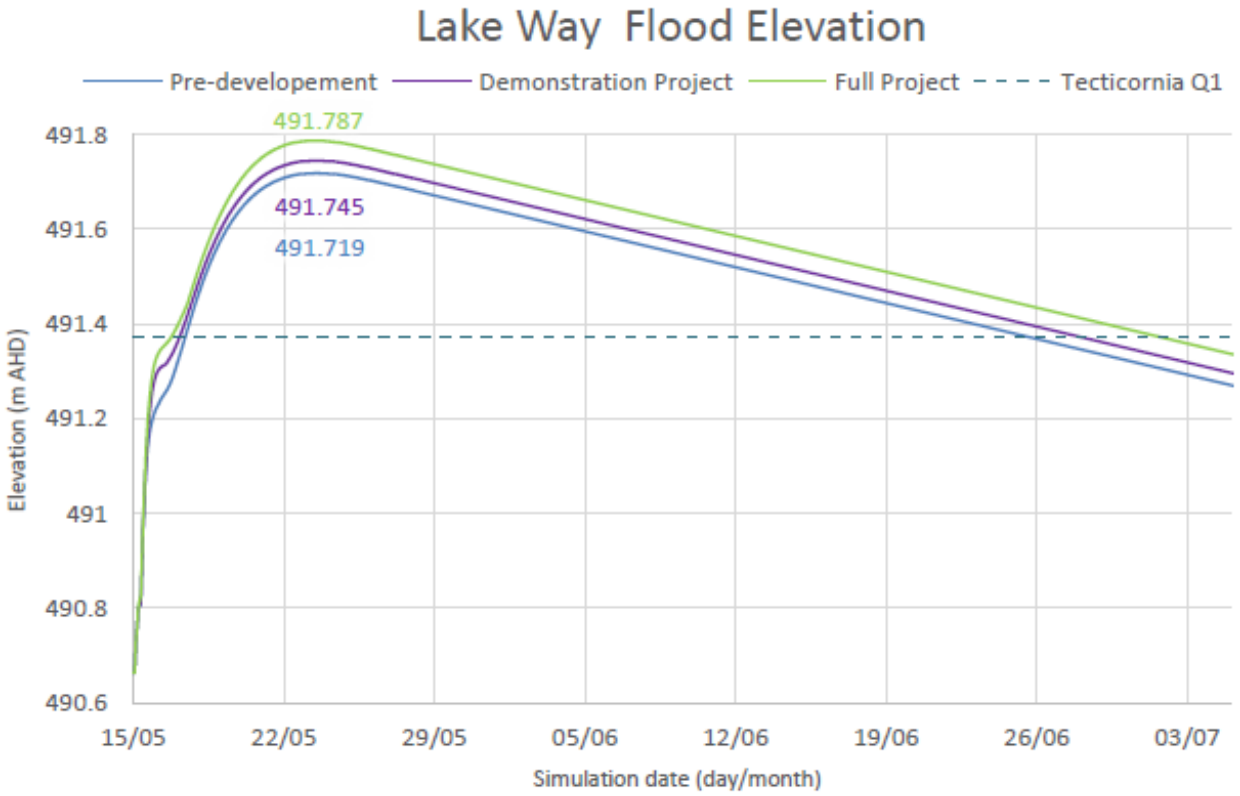
- Lake Way Hydrological Study and accompanying cover letter (Emerge Associates, November 2019)
- Lake Way Tecticornia Memorandum (Emerge Associates, November 2019)
- Lake Way Detailed Flora & Vegetation Survey (Botanica, November 2019)
- Salt Lake Potash Limited Lake Way Project Level 2 Fauna Assessment (Bamford Consulting Ecologists, November 2019)

The reports support SO4's position that the implementation of the proposal is unlikely to result in significant adverse impacts on environmental factors and values associated with the Lake Way environment. The findings from the hydrological and floristic studies contained in the attached reports are summarised in Table 1.

Table 1. Summary of results from studies completed for the Lake Way Sulphate of Potash Project.

Reference	Summary of Results
Emerge Associates, 2019. Lake Way Flood Modelling Report, Project No: EP19-056(02), November 2019.	1D-2D modelling of Lake Way was conducted to compare peak flood elevations, flooding extents and inundation durations for two development scenarios (demonstration project; full scale project) with a 'no-development' scenario. Flood comparisons were completed for the 1% AEP, 20% AEP and 63.2% AEP design rainfall events. The modelling took account of changes in available surface storage and vadose zone storage arising from project activities. The modelling builds on the results of previous hydrological studies (by others) of Lake Way and surrounding catchments. The methods used were consistent with the methodologies discussed in Australian Rainfall and Runoff: A Guide to Flood Estimation (Ball J et al. 2019). The modelling has identified that in the small and minor rainfall events (63.2% AEP and 20% AEP) there is no material change in the overall flooding elevations within Lake Way under either development scenario, compared to a 'no development' scenario. The modelling predicted minor changes in peak flood elevation under the Demonstration and Full Project development scenarios in the 1% AEP event (being an increase in flood elevation of 26 mm and 68 mm, respectively). The rise in 1% AEP peak flood elevation in the post-development scenarios can be attributed to the direct loss of surface flood storage due to the on-playa infrastructure. This effect is somewhat offset by the increase in vadose zone storage capacity resulting from brine extraction.

Reference	Summary of Results
	Flood model predictions are reliable when used as a comparison between development scenarios but should be used as a guide only when considering absolute flood extents and depths, as the variation in the flood depth is within the survey error (being +/-100mm). SO4 wish to acknowledge that the summary of the Lake Way Flood study undertaken by Emerge and provided to the EPA on 25/10/19 (doc ref EP19-056(02)--005B MGB), indicated that under the Full Project the 1% AEP top water level in the Lake would increase from 491.719 mAHD to 491.734 mAHD (i.e. an increase of 15 mm). Since the completion of this model, a more conservative approach has been adopted to the amount of recharge which may occur to sediments beneath the Lake playa, resulting in an increase to the predicted 1% AEP top water level in the Lake to 491.787 mAHD (i.e. an increase of 68 mm). The final Flood Modelling Report (doc ref EP19-056(02)--004A MGB) has been provided in this response and is based on the updated infiltration/recharge assumptions, and therefore the final report supersedes the previous summary of modelling letter provided.
Lake Way *Tecticornia* Memorandum (Emerge Associates, November 2019)	Hydrological modelling estimates that the increased extent of potential *Tecticornia sp.* habitat that would be inundated following a 1% AEP (1 in 100 year) flood event – relative to the flooding that would occur in the absence of project development – is in the order of 167.75 ha, corresponding to approximately 2.05% of the mapped extent of *Tecticornia sp* habitat at Lake Way. The likelihood of a 1% AEP event occurring during a nominal 20 year mining project is approximately 18%. The maximum increased depth of flooding (compared to the pre-development scenario) following a 1% AEP event was estimated to be approximately 68mm. Assuming average evaporation rates in the post-flood period, this represents a maximum increase in ponding duration of the *Tecticornia sp.* mapped habitat of about 7 days (at the lower quartile elevation of mapped *Tecticornia sp* , Figure 1 below).

Reference	Summary of Results
	Figure 1. Flood depth over time, compared to the minimum Tecticornia habitat area (Q1)  It can be seen from the above figure that in the pre-development 1% AEP event, some of the *Tecticornia sp.* habitat would already be inundated to an approximate depth of 400mm, and therefore the overall change of impact to this habitat is negligible.

Reference	Summary of Results
	Table 2 provides a summary of the changes to inundation of *Tecticornia sp.* in response to a 1% AEP event at the Toro exclusion zones (Ministerial Statement 1051) under a pre-development, demonstration and full project post development scenario. The full project post-development model shows minor increases in flood extents in the exclusion zone buffers[1] defined for the Wiluna uranium project.

Table 2. Spatial extent of 1% AEP peak flood inundation at Toro Tecticornia sp. Exclusion sites.

Tecticornia species Buffer Code	Pre-Deve (ha)	Dem Project (ha)	Full Project (ha)
SF0299 *Tecticornia aff. Sp. Burnebinmah* (inflated fruit) 80m buffer	1.01	1.01	1.26
SF0328 *Tecticornia aff. Haloonemoides s.l 'large ovate seed aggregate'.* 50m buffer	0.61	0.61	0.61
SF0161 *Tecticornia aff. Haloonemoides s.l 'large ovate seed aggregate'.* 50m buffer	0.77	0.77	0.77
SF0174 *Tecticornia aff. Haloonemoides s.l 'large ovate seed aggregate'.* 50m buffer	0.00	0.00	0.06

[1] Note* Two *Tecticornia* exclusion buffer zones SF0222 and SF0272 have not been included in the impact assessment as they were outside of the extent of the digital elevation model.

Reference	Summary of Results
Botanica, 2019. Detailed Flora & Vegetation Survey Lake Way Potash Project, report prepared For Salt Lake Potash Limited, November 2019.	Desktop and field surveys conducted by Botanica between February 2019 and October 2019 to characterise flora and vegetation over the project area and surrounds, covering a total area of 72,586 ha (of which 16,672 ha was covered by the Lake Way playa). Nineteen vegetation units were identified within the survey area. Vegetation condition in the survey area ranged from 'poor' to 'very good'. No Threatened Flora or Threatened Ecological Communities (listed under State or Commonwealth legislation) have been recorded in the survey area. Eleven Priority Flora have been previously recorded (by others) in the general project locality. Some of these (notably *Tecticornia sp. Lake Way* (P. Armstrong 05/961) (P1), *Tecticornia sp. Sunshine Lake* (K.A. Shepherd et al. KS 867) (P1), *Eremophila arachnoides* subsp. arachnoides (P3), *Eremophila pungens* (P4), *Frankenia confusa* (P4), *Stackhousia clementii* (P3), *Eremophila sp. long pedicels* (G. Cockerton 1975) (P2), *Vittadinia pustulata* (P3) and possibly *Homalocalyx echinulatus* (P3)) were reported to occur within the survey area investigated by Botanica. Previous studies (by others) at Lake Way have also identified five novel Tecticornia taxa, six 'potentially novel' Tecticornia taxa and four range extension taxa in the general project locality (Niche, 2011; Ecologia, 2015). None of the novel, 'potentially novel' or range extension plant species previously reported at Lake Way have been listed as new taxa or formally recognised under the Biodiversity Conservation Act 2016.
Bamford Consulting Ecologists, 2019. Salt Lake Potash Limited Lake Way Project: Level 2 Fauna Assessment of the Expansion Project	Level 2 terrestrial fauna survey of project area delineated seven main habitat types in the general project locality. A field survey conducted in October 2019 confirmed the presence of 104 vertebrate fauna species including: one frog, 28 reptiles, 55 birds and 18 mammals (13 native and five introduced).Fauna species observed in the project locality included six conservation significant fauna (Table 3, below). Poor seasonal and annual weather conditions may have affected the field results. The contribution of project impacts to overall threatening processes was generally assessed as minor (habitat loss, habitat fragmentation, weed invasion, fauna mortality / injury from vehicle collisions, fire impacts, hydrological change). The effect of project activities on noise, light, and proliferation of feral predators was assessed as minor to moderate.

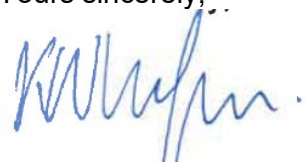
Reference	Summary of Results
Area, November 2019.	**Table 3. Composition of extant conservation significant fauna within the survey area with confirmed presence in brackets.**

Taxon	Conservation Significant fauna potentially occurring in project locality			Total
	CS1	CS2	CS3	
Frogs	-	-	-	-
Reptiles	-	-	2 (2 observed: *Underwoodisaurus milii; Lerista* 'Lake Way')	2 (2)
Birds	12		6 (1 observed: *Ardeotis australis*)	18(1)
Native Mammals	1?	2 (2 observed: *Dasycercus blythi; Nyctophilus major tor*)	1 (1 observed: *Dasycercus blythi*)	3 (3)
Total	**12**	**2 (2)**	**9 (4)**	**23(6)**

Note: numbers in parentheses represent confirmed species presence.

Please do not hesitate to contact me should you have any queries and/or require additional information.

Yours sincerely,



Ken Wilyman
Study and Approvals Manager Salt Lake Potash

Attachments:

Lake Way Hydrological Study and accompanying cover letter (Emerge Associates, November 2019)

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