ASX ANNOUNCEMENT

16 October 2017

LOW COST, ON-LAKE EVAPORATION POND MODEL CONFIRMED

Salt Lake Potash Limited (**the Company** or **SLP**) is pleased to advise the successful completion of field trials testing an on-lake, unlined evaporation pond model, which will result in significant capital expenditure savings for the Goldfields Salt Lakes Project (**GSLP**).

Highlights

- *Comprehensive geotechnical and geological investigation confirms the widespread availability of ideal in-situ clay materials for use in evaporation pond construction.*
- *Modelling based on geotechnical properties of the clays confirms the potential to build unlined on-lake ponds with negligible seepage inefficiency.*
- *An on-lake construction and pond testing program conducted at Lake Wells over the last six months has validated the unlined pond model, with brine seepage inefficiency well within modelled parameters.*
- *Amec Foster Wheeler estimate that comparative costs for 400ha of on-lake ponds are $1.6m (unlined) and $42.2m (HDPE lined), highlighting major potential cost savings.*

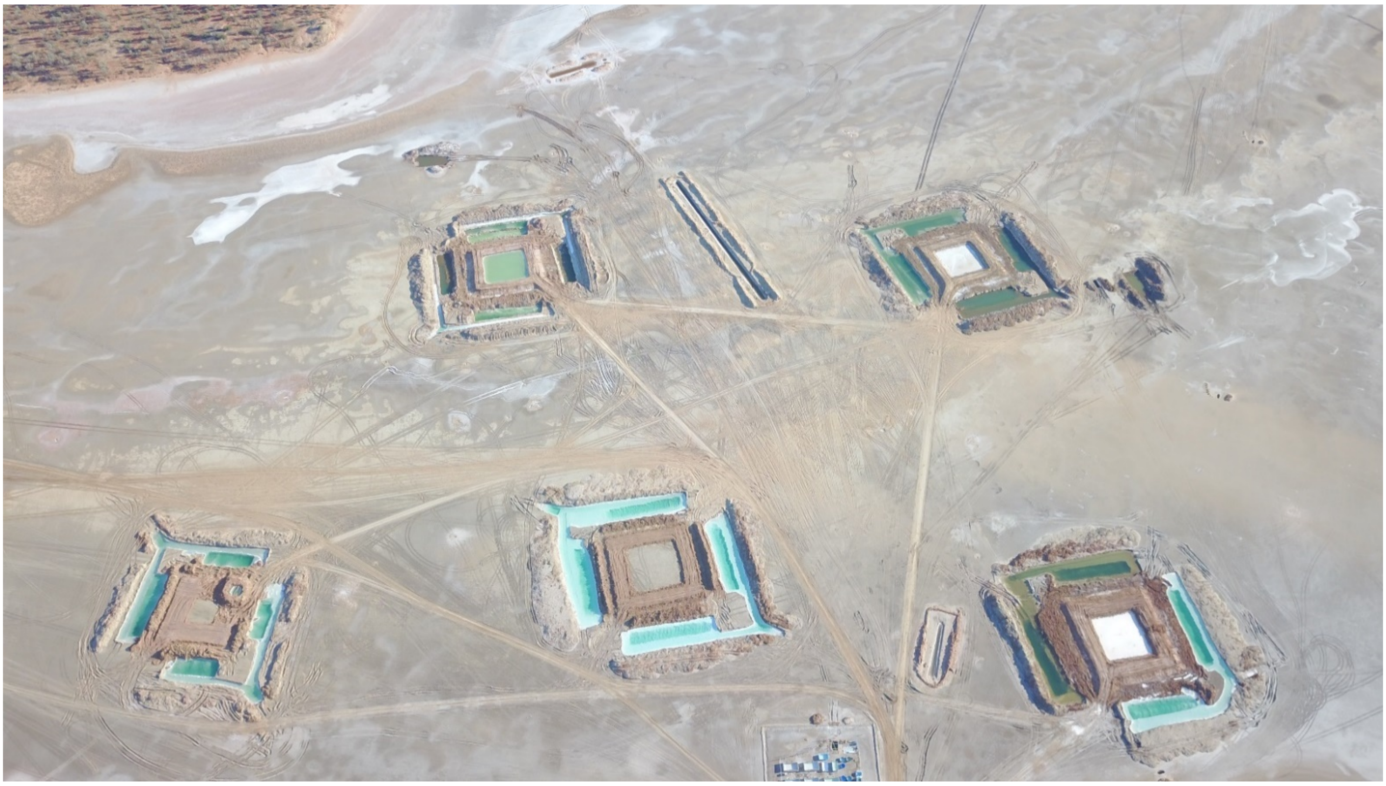

Figure 1: Evaporation Ponds at Lake Wells

The field trial involved construction and testing of four test ponds on the Lake Wells Playa, built solely from in-situ clay materials, using a standard 30t excavator, which operated efficiently and effectively on the lake playa. The trial achieved levels of brine seepage from the evaporation ponds well below the threshold for successful operation of halite evaporation ponds, and potentially also for the smaller potassium salt harvest ponds.

The capex savings from this construction method are substantial, compared to the alternative of plastic lined ponds. SLP's engineering consultant, Amec Foster Wheeler, estimates the cost of lined ponds to be approximately \$10.50 per m^2, up to 25 times higher than construction costs for unlined ponds.

The 25m x 25m test ponds were designed by SLP's geotechnical consultant, MHA Geotechnical (**MHA**), to test the constructability and operating performance of a number of pond wall designs and to provide reliable seepage data under site conditions. The observed brine loss in the test ponds was well within the parameters of the hydrodynamic model, indicating losses for a 400ha pond will be below 0.125mm/day.

The Company has identified several opportunities to improve the construction of commercial scale ponds using excavators, along with ancillary equipment to optimize drying and compaction of the clays utilized in pond wall construction. This should result in further improvements in the already very low seepage observed in the trial sized ponds.

SLP plans to now construct an 18ha Pilot scale pond system to further improve the pond design and construction model.

Commenting on the test outcomes, SLP's CEO, Matt Syme, said:

"We are very pleased to have successfully demonstrated and quantified the potential for on-lake, unlined evaporation ponds at the GSLP. The importance of this outcome cannot be understated for two reasons:

- *firstly, the potential capex savings are very substantial and*
- *secondly, this outcome is the final fundamental technical building block which we have tested and validated under field conditions and to a very high standard.*

Along with all of the Company's other high quality testwork on brine extraction and evaporation and the conversion of on-site harvest salts to high quality SOP, as recently validated and optimised by Saskatchewan Research Council, we believe we have rigorously tested all the technical elements of SOP production from salt lake brines to a standard not seen in Australia to date."

Enquiries:	***Matthew Syme (Perth)*** *Telephone: +61 (8) 9322 6322*
	Jo Battershill (London) *Telephone: +44 207 478 3900*

The GSLP SOP Production Process

The proposed process for production of Sulphate of Potash (**SOP**) at the GSLP requires brine extracted from Lake Wells to be concentrated in a series of solar ponds to induce the sequential precipitation of salts, firstly eliminating waste halite and then producing potassium-containing Harvest Salts, mostly kainite and carnallite, in the harvest ponds.

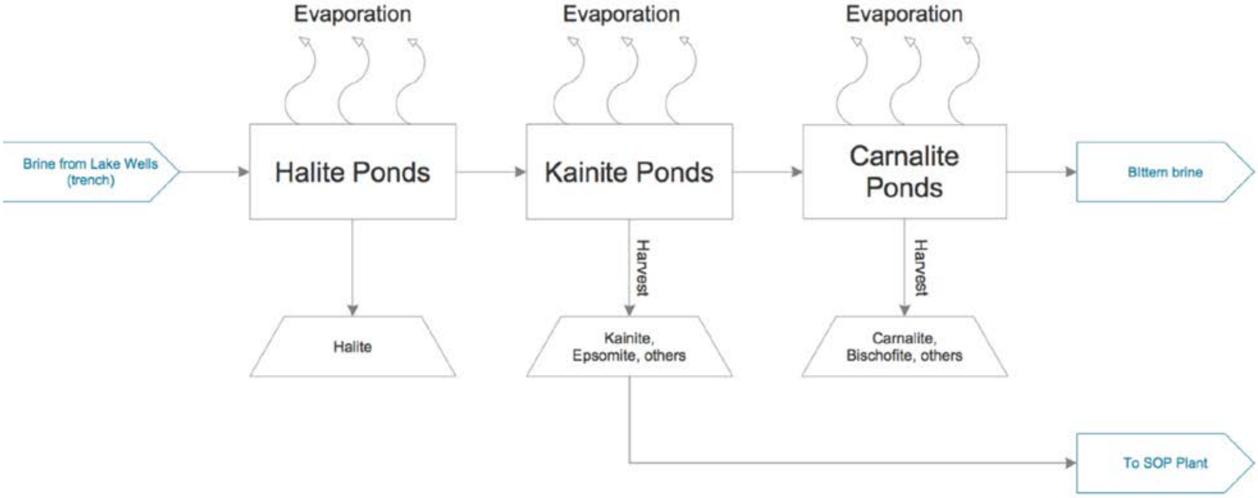

Figure 2: Simplified Lake Wells (GSLP) salt precipitation ponds

The Harvest Salts are then treated in a processing plant to convert these salts into SOP, while minimising deportment of sodium chloride (a contaminant) to the product. See the announcement dated 14 September 2017 for further details of the Company's successful salt processing testwork.

The ability to cost effectively and efficiently produce Harvest Salts is in part dependent upon the evaporation ponds retaining brine adequately to maximise brine evaporation and therefore, salt precipitation. Some seepage inefficiency early in the evaporation process, in the Halite ponds, is acceptable as the brines are still relatively low in value.

Several potential options exist for construction of Halite ponds depending on the local geological conditions. In some geological settings, there is no alternative to plastic lining of evaporation ponds. For example, the sub surface of the Salar de Atacama in Chile is comprised principally of rock salt, which is both soluble and highly permeable. In this case there are no in-situ clays available for lining ponds so, plastic liners are employed to hold the brine. These liners require constant maintenance to ensure holes are repaired to avoid significant brine loss.

If, as has been shown to be the case in Lake Wells, suitably impermeable clays are available, they can be used to construct ponds walls or dykes to retain brines within the ponds, to allow evaporation of brines and to crystallise the required salts. As a rule of thumb, reducing seepage below 0.25mm of pond level per day is acceptable for a commercial scale system.

It is important to note that seepage does not mean brine (and potassium) is lost altogether, but rather that the system is less efficient, as any seepage to the playa sediments is recovered eventually by the brine harvest trenches and returned to the ponds.

Lake Wells Geotechnical and Geological Database

A total of 105 drill holes and 250 test pits have provided a very comprehensive database of the stratigraphy and geology of the upper levels of the Lake Wells playa. This understanding has supported an ongoing assessment of brine extraction potential via trenching, as well as the suitability of the clay lithologies for pond construction.

The interpretation of the lithological logs from the drill holes, test pits and trenches has enabled the development of a standardised stratigraphy, which comprises four units from shallowest to deepest, being:

- a thin layer of evaporate sands;
- a red-brown silt with high clay content;
- a grey-olive-yellow mottled clay that is plasticine in nature and stiff to very stiff; and
- a red-brown clay with varying silt content that is more massive and indurated with depth.

The average stratigraphy is represented by the section set out in Figure 3 below,

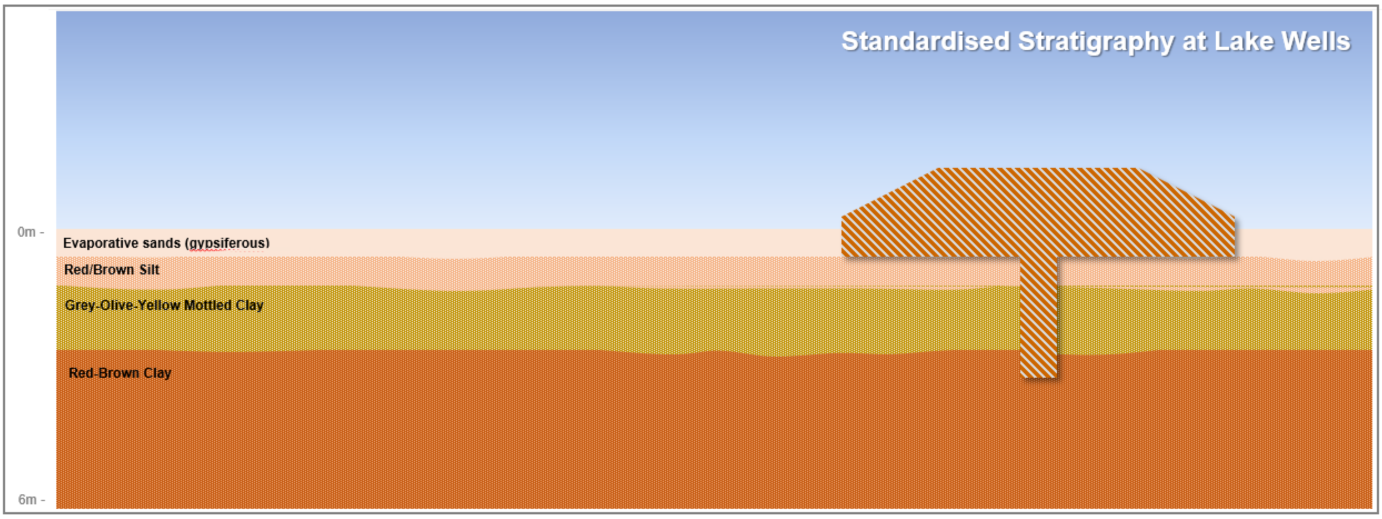

Figure 3: Cross Section of the Average Lake Wells Stratigraphy

Additional Geotechnical Work for Pond Trial

To provide input data for both the pond construction trial and the hydrodynamic model a detailed investigation of the sub-surface stratigraphy was carried out by MHA. The investigation aimed at assessing the ground conditions and evaluating the suitability of in-situ borrow materials for pond construction.

A comprehensive data set was created from the investigation which included:

- Test pits excavated using a 30t excavator to provide bulk samples for laboratory testwork and visual inspection of the in-situ stratigraphic arrangement;
- Hand auger boreholes;
- Electric friction cone penetrometer testing (EFCPT);
- Piezocone/CPTu testing;
- Field permeability testing (Rising/Falling Head);
- Field moisture content testing;
- Dynamic Cone Penetrometer testing; and
- Laboratory testing of disturbed soil samples.

Figure 4: Cone Penetrometer Rig in Operation on Lake Wells

The MHA review concludes that stratigraphic model above is robust and consistent within the lithological logs from the test pits and trenches, as well as the recent geotechnical assessment using CPT.

Based on the geotechnical assessment, the mottled clay and tight clay units have similar hydraulic properties that form highly impermeable horizontal layers. The average in-situ permeability of the typical Lake Wells stratigraphy is represented in Table 1, below.

Material Type	Typical Depth (m)	Permeability (m/s)
Evaporate SAND	0.0m – 0.8m	5.00 E^{-05}
Brown/Red Sandy SILT	0.8m – 1.1m	9.00 E^{-07}
Mottled Red – Brown Silty CLAY	1.1m – 2.5m	4.00 E^{-08}
Red-Brown CLAY	2.5m – 5.5m	1.00 E^{-09}

Table 1: Typical In-Situ permeability of the typical stratigraphy at Lake Wells

It is important to note that plastic liners of this scale have a tendency to leak and, as such, a conservative design parameter for ponds constructed with a plastic liner would be in the same order of magnitude as that assigned to the Red-Brown Clay in Table 1, above - 1.00 E^{-09}.

There is a high level of repeatability in the presence and lateral extent of these stratigraphic units across Lake Wells. The clays are pervasive and largely continuous beneath the lake surface. Over 83% of test pits and drill holes encountered the top two clay lithologies in the first 3m and 98% within 6m.

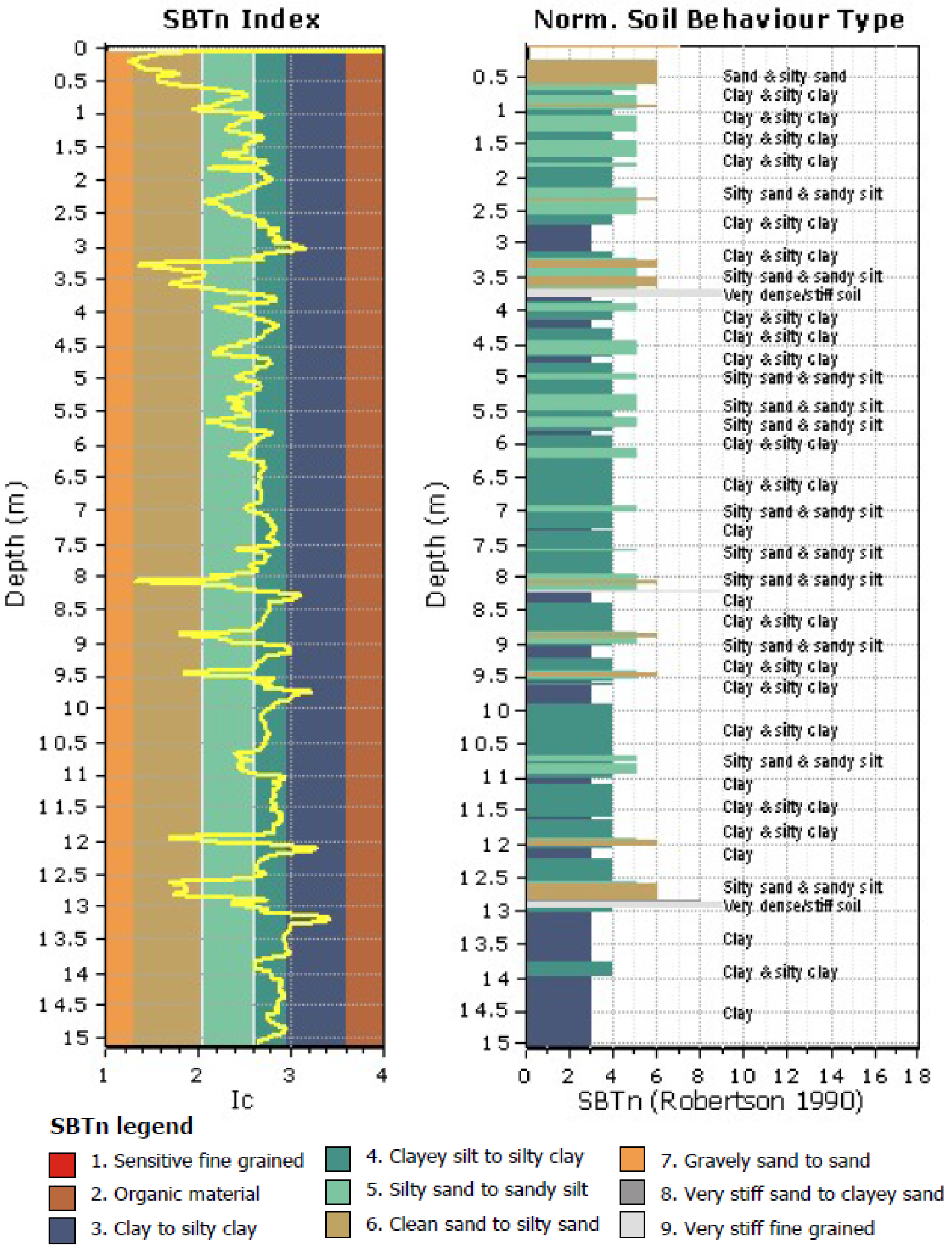

Figure 5: Example of CPT Log (CPT18)

Hydrodynamic model

MHA Geotechnical and its associate Soilwater Group prepared several Hydrus model simulations of the ability of pond embankments constructed using a basic dyke/key design to retain 1m of brine above the evaporate sand layer.

The in-situ material and embankment material parameters used to construct the models are shown in Table 2, below. Although lab testing of the Mottled and Red-Brown clays showed, under ideal moisture conditions, can achieve permeabilities at least as low as the in-situ clays, a conservative embankment material permeability was applied.

Material Type	Typical Depth (m)	Permeability (m/s)
Borrow Material (Embankment and Key)	N/A	6.00 E^{-08}
Evaporate SAND	0.0m – 0.8m	5.00 E^{-05}
Brown/Red Sandy SILT	0.8m – 1.1m	9.00 E^{-07}
Mottled Red – Brown Silty CLAY	1.1m – 2.5m	4.00 E^{-08}
Red-Brown CLAY	2.5m – 5.5m	1.00 E^{-09}

Table 2: Typical In-Situ permeability of the typical stratigraphy at Lake Wells

A larger scale Mod-Flow model was then constructed using the above parameters considering both potential embankment seepage and potential seepage through the floor of a 2km x 2km pond (demonstration plant scale).

The model concluded that such a pond would have a total seepage of 0.125mm/day, substantially less than the maximum allowable seepage that SLP requires for the efficient operation of large halite ponds.

Relative losses from a full-scale halite evaporation pond of, say, 20km^2 would be proportionately lower still, because seepage inefficiencies are effectively a pond edge effect. In a larger pond leakage from the center of the pond is negligible or nil.

Pond Construction Model

Based upon the model outcomes and known stratigraphy of the Lake a Test Pond was constructed using the following construction parameters:

1. Stripping of the Evaporite Sand layer from the Embankment area;
2. Excavating appropriate clays from a borrow trench adjacent to the Embankment;
3. Airdrying the clays to a target moisture range defined by laboratory testing;
4. Excavating a trench approximately 3m deep into the lake surface to intersect the impermeable mottled and tight clay units – terminating in the tight clay;
5. Filling the trench with dried, compacted borrow clays to form a relatively impermeable lateral key.
6. Building a berm approximately 2m high over the key, also from dried, compacted clays. For the trial ponds this compaction was achieved by traversing the area with the excavator tracks.

A typical Embankment design is shown in Figure 6, below. Additional models were also tested with a total of four ponds constructed to test the sensitivity of the Embankment construction with seepage.

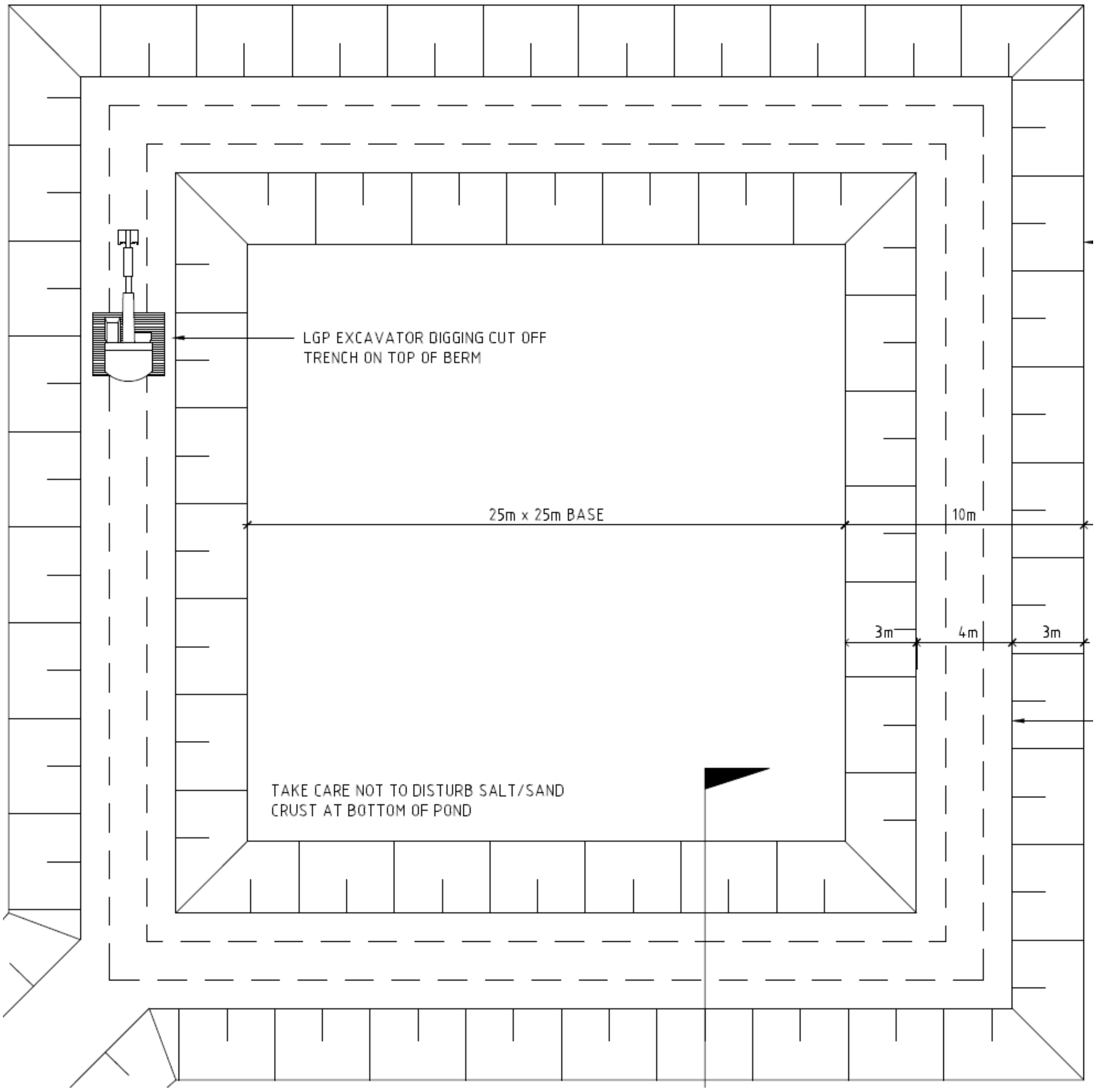

Figure 6: Detailed Design of Evaporation Pond 3

At 25m x 25m (**Test Pond**) scale, the pond model indicates leakage of approximately 3mm/day can be expected due to higher ratio of embankment length to pond area.

Pond Construction

A 30t excavator was mobilized to construct the four 25m x 25m test ponds and a 5m x 5m plastic lined control pond, to measure evaporation. The excavator traverses and works on the lake playa without significant impediment and has a vertical reach of approximately 6m.

Figure 7: Construction of an Evaporation Pond at Lake Wells

The trial pond construction program has provided important information on the clay excavation, drying and wall construction process, which will result in considerable efficiencies as the ponds are scaled up.

For convenience, the single 30t excavator was used for all elements of pond construction including excavation, scarifying clays for drying and compacting the pond keys and berms. At operational scale, different equipment is likely to be utilized for some elements, improving both efficiency and effectiveness of construction.

Figure 8: Evaporation Test Pond 3

Test Pond Results

Test Pond 3 (**TP3**) represents the as-modelled embankment construction and is the most likely design for commercial scale embankments. A total of 32 piezometric standpipes and 12 water data loggers were installed in and around all four walls of TP3, along with water level measuring devices on the floor of the pond and in the surrounding trenches, to accurately measure the water levels both in the pond and within the embankments.

The embankment and key are constructed from clay which has been air-dried prior to compaction to ensure target compaction and permeability are achieved. After the embankment and key material is saturated, the seepage from the pond, net of brine evaporation (data from the control pond) represents seepage losses through and below the pond walls. As discussed above, net seepage losses of less than 3mm per day at test pond scale will substantially validate the shallow lake lithology, geotechnical characteristics and pond construction model for production scale, clay lined, on-lake halite evaporation ponds.

TP3 was initially filled with lake brine to approximately 500mm on 29 August 2017. The small, plastic lined, control pond was also filled to provide an accurate measure of evaporation rates.

Water level and piezometer readings have been taken twice daily since and on 18 September 2017 the ponds were topped up, TP3 to approximately 1,000mm in this case, to accelerate wall saturation.

Since initial brine fill, the average net seepage at TP3 equates to approximately 2.4mm per day. This figure includes “losses” to wall saturation as well as to seepage, indicating that steady state seepage losses will be comfortably below the 3mm per day threshold modelled for this scale of pond.

Figure 9: Pond 3 Constructed with Salt already forming

Capital Cost Comparison

The Company’s engineering consultants, Amec Foster Wheeler, have generated scoping level cost estimates comparing two pond construction options for a 400ha halite pond. For ponds built on-lake on a relatively flat playa, with no provision for salt harvesting, and a 2.0m high wall, Amec Foster Wheeler estimate direct capital costs (accuracy of -10%/+30%) of:

- Unlined – A$1.6m
- Lined – A$42.2m

The main costs of the lined ponds are the supply and installation of HDPE lining and placement and compaction of a sand bedding layer. If similar ponds were constructed off lake then clearing and levelling costs would be additional.

For either lined or unlined ponds, if salt harvesting is required a layer of halite must first be deposited and compacted, to provide a support base for harvesting equipment. As the Company does not plan to harvest halite from its ponds, these costs are not included in the Amec Foster Wheeler analysis.

Conclusions and Further Work

Results from the Company's evaporation pond trial at Lake Wells have exceeded expectations and strongly validated SLP's model for construction of low cost, on-lake, unlined evaporation ponds. Net seepage of 2.4mm per day in a test scale pond extrapolates to less than 0.125mm per day in a 400ha demonstration plant scale halite pond, a negligible inefficiency in the context of overall pond operations.

Standard earthmoving equipment has worked very effectively on the lake playa in construction of both ponds and also brine extraction trenches. While final design and construction methodology is ongoing, work to date validates that very substantial cost savings – up to 95% - are possible, compared to the alternative of plastic or HDPE lined ponds.

These results also provide encouragement that on-lake, unlined evaporation ponds may also be suitable for kainite and carnallite harvest ponds. If this is the case, further considerable capex savings will be possible.

Having demonstrated that the large open playa surface and pervasive clay lithology at Lake Wells has ideal attributes for very low cost and efficient evaporation pond construction, the Company is now considering a program for a larger scale pond and trench construction. This program will further refine construction methods and costs and also potentially test a construction model for on-lake harvest ponds, likely including a halite base for supporting harvest equipment.

The program would involve construction of up to 18ha of ponds to be supplied with brine from 2-3km of extraction trenches. For context, a demonstration scale project at GSLP may comprise up to 450ha of pond and 50-60km of extraction trenches, so the smaller pilot scale program would be a very cost-effective basis for optimising design and construction costs.

The Company is also conducting preliminary work on other lake playa's within the Goldfields Salt Lakes Project, which have similar geotechnical potential.

Forward Looking Statements

This announcement may include forward-looking statements. These forward-looking statements are based on Salt Lake Potash Limited's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Salt Lake Potash Limited, which could cause actual results to differ materially from such statements. Salt Lake Potash Limited makes no undertaking to subsequently update or revise the forward-looking statements made in this announcement, to reflect the circumstances or events after the date of that announcement.