

ASX Release 7 March 2018

## MACKAY SOP PROJECT FIELDWORK UPDATE

## **Highlights**

- Pump testing completed at a further three trench locations
- Indicative steady-state pumping rates of up to 4.3m³/day/m of trench
- Pilot evaporation pond construction nearing completion

Agrimin Limited (ASX: AMN) ("Agrimin" or "the Company") is pleased to provide an update of field activities underway at the Mackay Sulphate of Potash ("SOP") Project in Western Australia.

# Long-Term Trench Pump Testing

During 2017, the Company completed the excavation of 14 trenches across Lake Mackay (**Figure 1**). Between August and December 2017, four of the trench sites (being T1, T3, T6 and T9) were subject to long-term pumping tests with durations ranging from 25 to 125 days. Final pumping rates at the conclusion of each test were between 0.3 to 1.4m³ per day per metre of trench ("m³/day/m"). This data has been used to calibrate the hydrogeological model and to improve the understanding of brine recovery rates for the Pre-Feasibility Study ("PFS").

Long-term pumping tests re-commenced in January 2018 and have recently been completed at three additional trench sites (being T8, T11 and T12) with durations ranging from 14 to 45 days (**Table 1**). Final pumping rates at the conclusion of these tests were between 0.9 and 4.3m<sup>3</sup>/day/m. These rates are believed to be indicative of steady-state conditions for these trenches.

The wet season at Lake Mackay typically occurs between December and March each year and as to be expected the recently completed pumping tests experienced periods of rainfall and run-off. The Company has gathered valuable data from the trenches and monitoring bores during these active recharge events, which will provide important input into on-going hydrogeological modelling studies.

The excavated material from the pilot trenches has been used to construct enclosed bunds along the outsides of most trenches. This is also planned in the full-scale design for the trenches. The bunds act to prevent direct ingress of rainwater run-off into the trenches.

The bunds proved to be effective in limiting the impact of rainfall during the pumping tests at T11 and T12. The assay results of brine samples taken during these pumping tests show only negligible dilution to the brine



concentrations over the first 27 days (**Table 3**). Assays results are pending for the final 18 days of these tests. It is important to note that the first set of assays for each trench may have higher than natural concentrations due to the process of evaporation and concentration taking place during the period between when each trench was constructed to when pump testing was commenced.

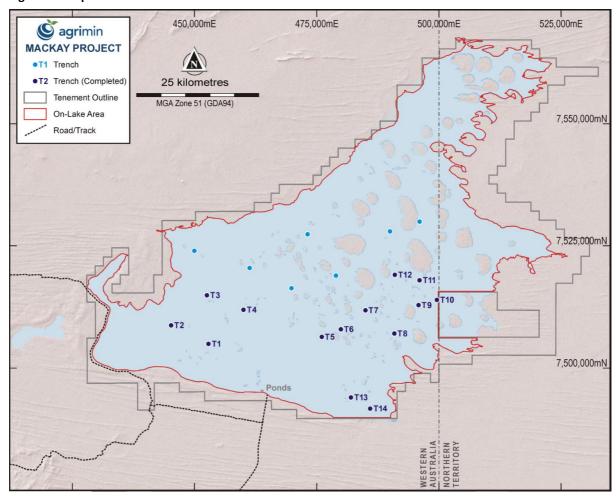


Figure 1. Map of On-Lake Trench Locations

**Table 1. Results of Long-Term Pumping Tests** 

Trench ID	Status of Pumping Test	Start of Pumping Test	Drawdown in Trench <sup>1</sup>	Duration of Testing Period	Total Volume Pumped <sup>2</sup>	Indicative Steady-State Pumping Rate
T1	Long-term test completed	4/8/2017	0.6m	60 days	7,904m³	1.4m³/day/m
Т3	Long-term test completed	10/8/2017	2.0m	125 days	4,166m³	0.5m³/day/m
Т6	Long-term test completed	13/10/2017	1.2m	25 days	890m³	0.3m³/day/m
Т8	Long-term test completed <sup>3</sup>	14/01/2018	2.5m	14 days	1,537m³	0.9m³/day/m
Т9	Long-term test completed	12/10/2017	0.6m	62 days	6,305m³	1.2m³/day/m
T11	Long-term test completed	12/1/2018	2.5m	45 days	6,933m³	1.6m³/day/m
T12	Long-term test completed	13/1/2018	1.1m	45 days	19,098m³	4.3m³/day/m

#### Notes:

1. All trenches are 100m in length. The depth of brine drawdown from the standing water table for each trench is shown in the table.



- 2. Mechanical issues with the pumps from time to time have caused pumping to stop for periods during testing which has resulted in the volume pumped being lower than what is achievable. The indicative steady-state pumping rate has taken this into account.
- 3. Pump testing at T8 was cut short due to salt precipitation issues in the pumping equipment. Due to the shorter duration of this test there is a lower level of confidence that a steady-state pumping rate was achieved.

The Company plans to continue long-term pump testing at further trenches to collect additional data at different sites across the lake to provide increased confidence in predicted brine recovery rates for a Definitive Feasibility Study.

## Other Fieldwork

The construction of pilot evaporation ponds commenced in December 2017. The ponds are being constructed on the lake surface using a cut-to-fill construction method, which is the same method proposed for full-scale construction. The size, number of cells and configuration of the pilot ponds is representative of the full-scale PFS design.

Notwithstanding the current wet season, pilot pond construction has progressed well with the major works now completed. A smaller excavator has been mobilised and the internal embankments are scheduled for completion in March 2018. The Company expects to commence operating the ponds in April 2018.

In addition, the Company has commissioned an airborne electro-magnetic ("AEM") survey to assist with mapping the broader Lake Mackay area to identify potential freshwater aquifers in close proximity to the proposed process plant site. The AEM survey is scheduled to commence in March 2018.

#### **ENDS**

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## **About Agrimin**

Based in Perth, Agrimin Limited is a leading fertilizer development company focused on the development of its 100% owned Mackay SOP Project. The Project is situated on Lake Mackay in Western Australia, the largest undeveloped SOP-bearing salt lake in the world. Agrimin is aiming to be a global supplier of high quality SOP fertilizer to both traditional and emerging value-added markets. Agrimin Limited's shares are traded on the Australian Stock Exchange (ASX: AMN).



### **Forward-Looking Statements**

This ASX Release may contain certain "forward-looking statements" which may be based on forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. Forward-looking information includes exchange rates; the proposed production plan; projected brine concentrations and recovery rates; uncertainties and risks regarding the estimated capital and operating costs; uncertainties and risks regarding the development timeline, including the need to obtain the necessary approvals. For a more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other ASX Releases. Readers should not place undue reliance on forward-looking information. The Company does not undertake any obligation to release publicly any revisions to any forward-looking statement to reflect events or circumstances after the date of this ASX Release, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.

#### **Competent Person's Statements**

The information in this statement that relates to Exploration Results for the Mackay SOP Project is based on information compiled or reviewed by Mr Michael Hartley, who is a member of AusIMM and the Australian Institute of Geoscience (AIG). Mr Hartley is a full-time employee of Agrimin Limited. Mr Hartley has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition). Mr Hartley consents to the inclusion of such information in this statement in the form and context in which it appears.

Table 2. Location and Dimensions of Pilot Trenches <sup>1</sup>

Trench ID	Easting	Northing	Excavated Depth	Trench Length
T1	452880	7504972	4.0m	100m
T2	445231	7508720	5.0m	100m
T3	452574	7514916	4.0m	100m
T4	460008	7512003	4.5m	100m
T5	474098	7504090	5.0m	100m
Т6	479984	7507964	5.5m	100m
T7	484981	7511898	6.0m	30m
Т8	490922	7507101	4.5m	100m
Т9	495997	7513449	6.0m	100m
T10	499725	7513971	6.0m	100m
T11	495998	7518001	6.0m	100m
T12	491031	7519093	6.0m	100m
T13	482030	7494097	6.0m	100m
T14	485923	7491845	6.0m	100m

Notes.

1. Locations are in GDA94 Zone 52.



**Table 3. Brine Chemistry of Pilot Trenches During Pumping Tests** 

Trench ID	Sample Date	K (mg/L)	Mg (mg/L)	SO₄ (mg/L)
Т1	4/8/2017	3,342	2,892	22,046
	16/8/2017	3,763	2,578	22,268
	2/9/2017	3,793	2,618	22,906
	5/9/17	3,631	2,848	14,399
	30/9/17	3,624	2,883	17,742
	10/8/2017	3,410	3,874	22,109
	16/8/2017	3,809	3,358	21,624
	2/9/2017	3,815	3,408	22,004
	30/9/17	3,646	3,688	21,967
	7/10/17	3,635	3,678	20,688
Т3	31/10/17	3,634	3,456	23,575
	6/11/17	3,782	3,609	23,146
	23/11/17	3,626	3,468	22,878
	25/11/17	3,557	3,465	17,481
	2/12/17	3,701	3,580	23,409
	9/12/17	3,766	3,643	30,514
	31/10/17	3,922	3,570	23,441
Т6	6/11/17	3,805	3,469	23,772
	15/01/18	5,863	5,336	42,276
Т8	21/01/18	4,701	4,108	32,971
	31/10/17	2,970	1,932	18,237
	6/11/17	3,103	2,008	18,750
	23/11/17	2,907	1,884	18,564
Т9	30/11/17	2,952	1,942	18,616
	2/12/17	3,040	2,013	19,038
	9/12/17	3,009	1,974	19,325
	13/01/18	4,768	2,551	28,645
	21/01/18	3,713	1,996	22,213
T11	28/01/18	3,456	1,865	20,976
T11	31/01/18	3,485	1,867	21,102
	4/02/18	3,379	1,875	21,312
	10/02/18	3,545	1,966	22,270
	14/01/18	3,365	2,140	21,009
	21/01/18	2,982	1,887	18,372
T42	28/01/18	2,957	1,842	18,012
T12	31/01/18	2,889	1,802	17,550
	4/02/18	2,798	1,801	17,823
	10/02/18	2,808	1,803	17,820
Mineral Resources: 1		3,603	3,036	23,051

## Notes:

<sup>1.</sup> Information that relates to Mineral Resources has been extracted from the Company's ASX Release on 15 December 2015.

<sup>2.</sup> The first set of brine assays for each trench may have higher than natural concentrations due to the exposure of brine to evaporation and concentration during the period of time between trench excavation and pump testing commencing.



# JORC Code, 2012 Edition – Table 1

# **Section 1 Sampling Techniques and Data**

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul> <li>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</li> </ul>	Sediment samples are collected from the excavator bucket at regular intervals to assess the lithology of the trenches at different depths.  Brine samples are collected into clean sample bottles from discharge hosing on the pump units at weekly intervals, representing a composite brine sample from the trench.
Drilling techniques	Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	Excavation of the trenches is completed by a 25t amphibious excavator with an arm to excavate up to 12m deep.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.  Measures taken to maximise sample recovery and ensure representative nature of the samples.  Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Not applicable to trenching.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.  Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.  The total length and percentage of the relevant intersections logged.	All trenches were logged for hydrogeological characteristics, including descriptions of lithology, sediment grain size, colour, general observations and flow rates.     A qualified hydrogeologist/geologist logged all samples.
Sub-sampling techniques and sample preparation	<ul> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all subsampling stages to maximise representivity of samples.</li> <li>Measures taken to ensure that the sampling is representative of the in situ material collected,</li> </ul>	Not applicable for trenching.     Representative brine samples are taken from the trenches by pumping, with a surface mounted pump.



Quality of assay data and laboratory tests	including for instance results for field duplicate/second-half sampling.  • Whether sample sizes are appropriate to the grain size of the material being sampled.  • The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.  • Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	The samples collected were analysed for elemental assay at Intertek laboratories in Perth, a reputable independent laboratory. Internal laboratory standards are in place to calibrate equipment and maintain analytical procedures.  The technique of analysis used is Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry for cations and sulphur, UV visible spectrometry for chloride, gravimetric analysis for Total Dissolved Solids (TDS). Sulphate concentration was calculated from the sulphur analysis.  Quality control procedures were in place throughout the analyses process, including the use of blanks, duplicates and laboratory certified standards.
Verification of sampling and assaying	<ul> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	Qualified hydrogeologists carried out the sampling of brine from pumped trenches.
Location of data points	<ul> <li>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul> <li>Trenches were located using a handheld GPS system, with accuracy of +/- 5m.</li> <li>The grid system used was GDA94 in MGA Zone 52.</li> <li>The salt lake surface is generally flat lying so high precision topographic control is not an important consideration for trenching.</li> </ul>
Data spacing and distribution	<ul> <li>Data spacing for reporting of Exploration Results.</li> <li>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</li> <li>Whether sample compositing has been applied.</li> </ul>	Trenches are broadly spaced at differing distances apart, generally 10-15km to evaluate different geomorphological areas of the salt lake. All brine samples are considered a composite from the top of water table to the depth of the trench.
Orientation of data in relation to geological structure	<ul> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	<ul> <li>Trench locations are considered representative of the broad lakebed sediment deposit.</li> <li>The lake sediments are a horizontally lying sequence and the sampling is perpendicular to this. Any structures of importance in the sediments are considered to be sub-horizonal.</li> <li>Some anisotropy in hydraulic parameters of the sediments is noted from the installation of monitoring wells on different sides of the trenches.</li> </ul>
Sample security	The measures taken to ensure sample security.	<ul> <li>All samples were clearly labelled and kept onsite prior to being transported to Perth, via secured freight, for analysis.</li> <li>Samples for assaying were submitted to an independent laboratory, with a chain of custody</li> </ul>
		system maintained.



# **Section 2 Reporting of Exploration Results**

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.  The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	The Project is 100% owned by Agrimin Limited. The project tenure is held under granted Exploration Licences and Miscellaneous Licences - E80/4887, E80/4888, E80/4889, E80/4890, E80/4893, E80/4995, E80/5055, L80/87 and L80/88. The Project is situated in the Kiwirrkurra native title determination area and a Native Title Mining Agreement has been signed with the Kiwirrkurra People.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Other companies including Holocene Pty Ltd,     Verdant Resources Ltd and Toro Energy Ltd have     completed exploration in the area previously.  The previous exploration has provided important     information on the geology and water quality in the     broader Lake Mackay area.
Geology	Deposit type, geological setting and style of mineralisation.	<ul> <li>The deposit type is brine-hosted potash in a salt lake/playa, with brine hosted in the pores of the sequence of flat lying sediments.</li> </ul>
Drill hole Information	<ul> <li>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:         <ul> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> </li> <li>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	Refer to trench location table in the ASX Release. Approximate RL of the lake is 355m.
Data aggregation methods	<ul> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	Brine samples from the trenches are the composite samples from inflow in the 100m long trenches.
Relationship between mineralisation widths and intercept lengths	<ul> <li>These relationships are particularly important in the reporting of Exploration Results.</li> <li>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</li> </ul>	The brine aquifer is considered to be continuous throughout the sediment profile of the lake, which has been confirmed by analyses of depth profiles in drilling conducted across the lake on a 5 km grid. The lake sediment units are flat lying and all holes have been drilled vertically so it is assumed that the true width of mineralisation has been intersected in each hole/trench.
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	Refer to figures within the ASX Release.



Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	Results considered relevant have been reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other exploration has been carried out within the Project area. Toro Energy Ltd (ASX: TOE) and Verdant Resources Ltd (ASX: VRM) have conducted potash and uranium exploration on neighboring tenure at Lake Mackay. Agrimin has previously reported the results of aircore and auger core drilling at Lake Mackay and the results of brine sampling from these programs.
Further work	<ul> <li>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	Work associated with the Pre-Feasibility Study for the Project is underway.