TODOROSKI AIR SCIENCES
Suite 2B, 14 Glen Street Eastwood, NSW 2122
Phone: 02 9874 2123
Fax: 02 9874 2125
Email: info@airsciences.com.au
Web: www.airsciences.com.au
ACN: 151 202 765 | ABN: 74 955 076 914

12April 2017

Garbis Simonian
Managing Director
Weston Aluminium Pty Ltd
Via email: gsimonian@westonal.com.au

**RE: Actions arising from 26 March meeting with EPA, DP&E and Weston Aluminium**

Dear Garbis,

Previously, in a letter dated 4 December 2017, Todoroski Air Sciences (TAS) reviewed the situation and suggested suitable emissions concentration limits for the Medical & Other Waste Thermal Treatment Process proposed for the existing Weston Aluminium facility, including operation of the existing pollution control plant at Weston Aluminium (WA), (hereafter referred to as the SSD Project).

**Current position**

On 26 March 2018, representatives from NSW EPA, DP&E and Weston Aluminium met to discuss the issues related to three proposed projects at the WA site:

1. SSD Project;
2. Pharmaceutical and illicit drug waste (commercial scale) processing (hereafter referred to as MOD 12); and,
3. Quarantine waste (trial) processing (hereafter referred to as MOD 11).

Apart from the different input materials, the key differences between these three projects are that the SSD Project would use a new rotary kiln with emissions being treated with the existing pollution control system, plus addition of activated carbon (lime injection already occurs and will continue). The new rotary kiln would be dedicated to process only waste material, has a secondary burner for emissions destruction and is ducted directly to the pollution control equipment.

Mod 11 and Mod 12 differ to the SSD Project in that they propose to process only small quantities of material in the two existing rotary furnaces in conjunction with the existing and approved processing operations (i.e. dross and SPL). For example 1% to 3% pharmaceutical waste by mass may be processed. The existing furnaces are not ducted directly to the pollution control equipment, and use large canopies or fume hoods to capture any process emissions from the furnace. This configuration is needed to allow for furnace rotation and tilt during normal operation and product tapping. The fume hoods are ducted to the pollution control equipment, however the layout means that most of the captured air is ambient air from inside the building. In this case, correcting the measured emissions data for oxygen levels for MOD 11 and MOD 12 is not appropriate for a number of reasons, one of which is that it leads to the calculation of incorrectly high pollutant concentration levels simply due to the normal imprecision in the oxygen levels (and in any case, the corrected result is not representative of any actual emissions as may be relevant to assess any potential impacts).

**Table 1** outlines the actions arising from the 26 March 2018 meeting, and summarises the current position:

**Table 1: Outcomes of WA/ EPA/ DP&E meeting held on 26 March 2018**

| Item | ISSUE | ACTION |
|---|---|---|
| **SSD Project** | | |
| 1 | EPA still seeking design flow data, WA note Design Engineer provided performance guarantee, AQIA shows criteria met for worst case conditions.<br><br>Process Flow Diagram provided to DP&E/EPA (early 2017), does not have air flow details (only preliminary data are available as WA need to know the stack emission limits in order to finalise the design and thus calculate design flows etc. in their detailed design). | WA to Provide Process Flow Diagram, including preliminary air flow and temp data (as developed by Design Engineer). |
| 2 | EPA comfortable with proposed limits for all emission parameters (per TAS, 2017), but note $H_2SO_4$ glc. is ~ 90% of guideline criteria (based on a proposed 100% concentration limit of 100 mg/m$^3$). WA note this only arises for the worst-case air dispersion hour, out of the 8,760 hours of the year when operation is being modelled at 100% of the limit in every hour.<br><br>EPA declined to comment on what "safety" margin is acceptable to EPA in this case, and seek WA to justify limit.<br><br>WA commented that a suitable safety margin is inherent to the modelling and criteria, which are met, and this is the purpose of the criteria and assessment process. WA also noted that there is an inherent driver to limit $H_2SO_4$ to prevent corrosion damage to plant, and that this substance is not regulated in Europe for such facilities. | In order to satisfy EPA concern, WA is to prepare justification for an alternate $H_2SO_4$ concentration limit that is lower than the proposed limit.<br><br>EPA to issue limits per TAS 2017, and alternative lower $H_2SO_4$ limit. |
| 3 | Agreed to implement post commissioning emissions testing program to verify process control as the alternative, (characterising wastes etc.) is not feasible given the nature of the material, and the nominally small quantities and mixes of materials.<br><br>EPA commented that this need not be done prior to approval/ licencing and could be done later. | WA to prepare a preliminary Plan to outline the emissions testing program to implement during post-commissioning phase of Project, including targeted parameters, adopted methodology, and consideration of constraints. |
| 4 | EPA has been incorrectly imposing $O_2$ corrections. A correction may be applied if warranted and appropriate but it is not automatically applicable or required per the legislation (other than for Dioxins).<br><br>In this process, cooling air is used to quench the emissions stream at a point after the rotary kiln and secondary burner, and prior to injection of carbon and/or lime and before the bag filter. The cooling air is needed to control potential dioxin formation and to allow the pollution equipment to operate correctly. The cooling air is an inherent part of the plant design and process. This cooling air will mean the oxygen levels in the stack are high. In this circumstance, an oxygen correction is not appropriate.<br><br>To ensure the kiln and secondary burner operate correctly, WA will monitor the oxygen level pre-addition of the cooling air, and maintain it within the range specified by the design engineer in the final design. | Refer to item 1. |



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| Modification 12 | | |
|---|---|---|
| 5 | Group 6 emission classification may not be correct; Group 6 requirements are not triggered if emissions associated with any new activity do not increase or materially affect the existing situation. EPA is now aware that only a minor quantity/ contribution of pharma/drugs c.f. conventional input quantities would occur.<br><br>EPA has been incorrectly imposing $O_2$ corrections. EPA and DP&E representatives have viewed photos of furnace configuration and now appreciate that this is not a sealed system.<br><br>In this process, the stack air discharge is the air collected by the fume hoods above the furnaces. This is predominantly fresh air, plus the fume from the furnace. The measured oxygen levels in the discharge stack are approximately 20%, which is close to ambient air (20.9%), reflecting that the discharge is indeed predominantly the fresh air collected by the fume hood. An oxygen correction is not appropriate in this case.<br><br>It is noted that the POEO Clean Air regulation does not require such corrections to be made, with the possible exception of dioxin emissions. | WA to prepare statistical analysis of trial-related and historical emissions data. This would confirm whether there is any material change in the emissions. |
| **Modification 11** | | |
| 6 | Item only briefly touched on during meeting, but reference can be made to Item 5 above.<br><br>EPA may be open to consideration following outcome re: Commercial-Scale Pharma/Drug Modification.<br><br>Objective of proposed Trial seeks to confirm thermal processing viability and to demonstrate emissions control system performance against existing limit criteria. | WA to forward a copy of Biosecurity Australia Approval, along with Criteria documents for which the Biosecurity Australia Approval is based. |

**WA response to action items**

The meeting on 26 March 2018 raised six key items, as listed in the table above. Each item is addressed below:

**SSD Project**

Item 1: Appendix 1 contains the Process Flow Diagram, and the preliminary air flow and temperature data (as developed by Design Engineer).

Item 2: WA originally proposed a 100% $H_2SO_4$ concentration limit of 100 mg/m$^3$, and appreciate the EPA's feedback that at the proposed limit, the modelling assessment forecasts a maximum ground-level concentration equivalent to approximately 90% of the guideline criterion. WA has consulted with their design engineer, who has confirmed that a limit for $H_2SO_4$ of 80 mg/m$^3$ can be achieved by the proposed plant. This would result in ground level concentrations significantly below EPA criteria. WA would thus accept a limit for $H_2SO_4$ of 80 mg/m$^3$. This limit results in maximum ground level concentrations less than 75% of the EPA criteria.

Item 3: WA has re-confirmed that post approval, it agrees to develop (in conjunction with the EPA) and implement an emissions testing program during the post-commissioning phase of Project, including targeted parameters, adopted methodology, and consideration of constraints.

It is anticipated that the program would conduct testing to measure the following pollutants and parameters within one month of commissioning: Particles, sulfuric acid mist, hydrochloric acid, heavy metals, cyanide and gaseous fluoride, oxides of nitrogen, carbon monoxide, dioxins and furans, temperature, oxygen and air flow velocity.

Wherever any elevated or unexpected result occurs in the sampling program, an investigation to identify the cause, and thence corrective action would be taken. It is anticipated that the post-commissioning testing will determine the need for any continuous monitoring to be installed.

Item 4: Refer to table and item 1.

**MOD 12**
Item 5: a) WA and TAS have conducted an analysis of the Mod 12 Trial results, see Appendix 1.

The graphical analysis shows that the measured data fall within the range of data being measured for the approved operation. The statistical analysis shows that the results can be considered to sit within, or to be drawn from the same data as the existing data set and are within the normal variability inherent in the existing case.

It is therefore concluded that the emissions due to MOD12 would not be tangibly different to the emissions from the approved process, and thus the proposal would not trigger Group 6 classification.

**MOD 11**
Item 6: The relevant Biosecurity Australia documentation accompanies this letter.

As MOD 11 issues were only very briefly discussed at the 26 March meeting the details of EPA's opposition to the trial are unknown, but appear to be that the existing plant may not represent best practice plant design.

As there are now only minor matters to attend to in order to finalise the air emission limits for the SSD Project, and thus conclude the SSD Project, it may be relevant to note that if a timely approval for the SSD Project can be provided, e.g. by May 2018, WA would be prepared to withdraw the MOD 11 application. The SSD Project would allow quarantine materials to be processed in a new rotary kiln, which does represent best practice plant design.

**Concluding comments**
The above responses to the action items arising from the 26 March 2018 meeting should allow the EPA and DP&E to reasonably finalise appropriate licence limits for the SSD Project and MOD 12.

Please feel free to contact me directly to discuss or clarify any aspect of this report.

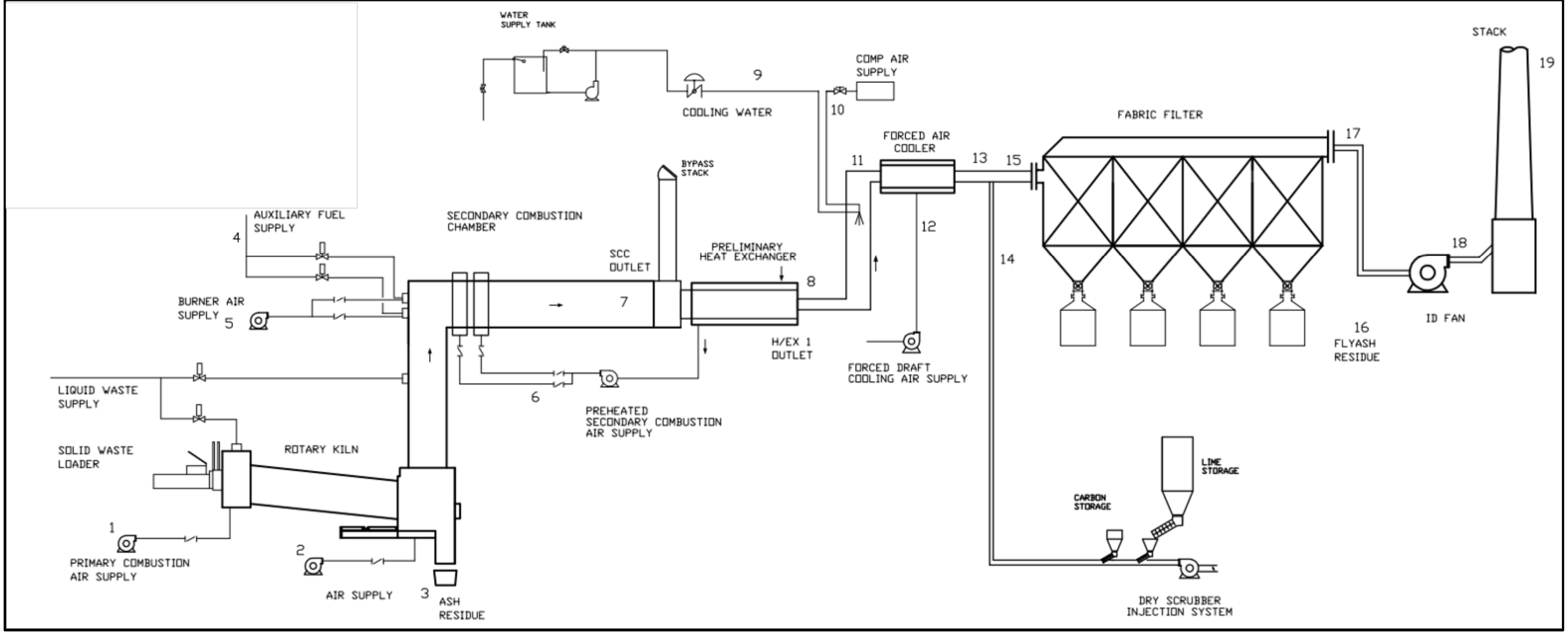
Yours faithfully,

Todoroski Air Sciences

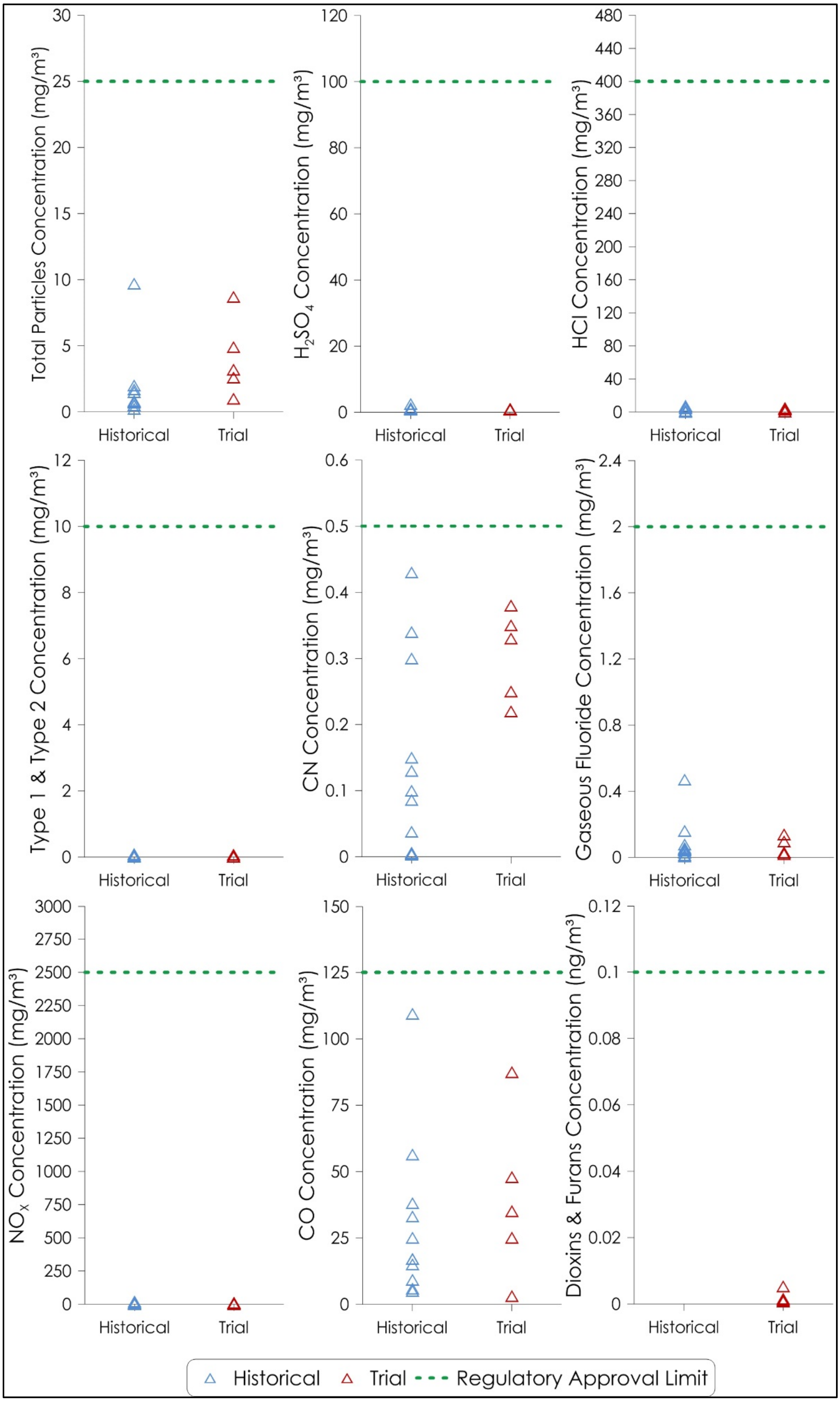
Aleks Todoroski

**APPENDIX 1 – Flow and temperature data (preliminary design data)**

| Parameters | Units | Process Flow Stages (air flows and temp) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Description | | Air | Air | Air | Air | Flue Gas | Flue Gas | Air | Flue Gas | Air | Dilute Flue | Air | Dilute Flue | Ash | Dilute Flue | Dilute Flue | Dilute Flue |
| Flow | Am3/s | 0.44 | 0.44 | 0.07 | 3.57 | 18.15 | 15.51 | 0 | 14.14 | 18.13 | 32.64 | 0.22 | 32.95 | - | 32.93 | 32.93 | 32.92 |
| Temperature | DegC | 30 | 30 | 30 | 161 | 1100 | 900 | 30 | 700 | 25 | 160 | 30 | 160 | 4 | 160 | 160 | 160 |



**APPENDIX 2 – Graphical and statistical analysis of MOD 12 trail results**



| Parameter: | TP | | $H_2SO_4$ | | HCl | | HM's | | Gaseous HF | | CN | | $NO_x$ | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** | **Hist.** | **Trial** |
| **Average:** | **1.74** | **4.08** | **1.13** | **0.88** | **2.20** | **3.24** | **0.04** | **0.02** | **0.09** | **0.06** | **0.11** | **0.31** | **6.59** | **7.80** | **30.11** | **39.70** |
| **Std. Deviation:** | **2.70** | **2.94** | **0.48** | **0.07** | **2.47** | **1.73** | **0.03** | **0.03** | **0.13** | **0.05** | **0.14** | **0.07** | **5.52** | **4.27** | **30.53** | **31.38** |
| **F-Test Two-Sample** | | | | | | | | | | | | | | | | |
| | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* |
| Mean | 4.08 | 1.74 | 1.13 | 0.88 | 2.20 | 3.24 | 0.04 | 0.02 | 0.09 | 0.06 | 0.11 | 0.31 | 6.59 | 7.80 | 39.70 | 30.11 |
| Variance | 8.62 | 7.27 | 0.23 | 0.00 | 6.09 | 2.98 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 30.44 | 18.20 | 984.70 | 931.80 |
| Observations | 5.00 | 11.00 | 11.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 | 15.00 | 5.00 | 11.00 | 5.00 | 5.00 | 11.00 |
| df | 4.00 | 10.00 | 10.00 | 4.00 | 10.00 | 4.00 | 10.00 | 4.00 | 10.00 | 4.00 | 14.00 | 4.00 | 10.00 | 4.00 | 4.00 | 10.00 |
| F | 1.19 | | 50.82 | | 2.04 | | 1.55 | | 6.22 | | 4.26 | | 1.67 | | 1.06 | |
| P(F<=f) one-tail | 0.37 | | 0.00 | | 0.26 | | 0.36 | | 0.05 | | 0.09 | | 0.33 | | 0.43 | |
| F Critical one-tail | 3.48 | | 5.96 | | 5.96 | | 5.96 | | 5.96 | | 5.87 | | 5.96 | | 3.48 | |
| **t-Test: Two-Sample** | | | | | | | | | | | | | | | | |
| | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* | *Var. 1* | *Var. 2* |
| Mean | 1.74 | 4.08 | 1.13 | 0.88 | 2.20 | 3.24 | 0.04 | 0.02 | 0.09 | 0.06 | 0.11 | 0.31 | 6.59 | 7.80 | 30.11 | 39.70 |
| Variance | 7.27 | 8.62 | 0.23 | 0.00 | 6.09 | 2.98 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 30.44 | 18.20 | 931.80 | 984.70 |
| Observations | 11.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 | 15.00 | 5.00 | 11.00 | 5.00 | 11.00 | 5.00 |
| Pooled Variance | 7.65 | | | | 5.20 | | 0.00 | | | | 0.02 | | 26.94 | | 946.91 | |
| Hypothesized Mean Difference | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| df | 14.00 | | 11.00 | | 14.00 | | 14.00 | | 14.00 | | 18.00 | | 14.00 | | 14.00 | |
| t Stat | -1.57 | | 1.68 | | -0.85 | | 0.78 | | 0.60 | | -3.01 | | -0.43 | | -0.58 | |
| P(T<=t) one-tail | 0.07 | | 0.06 | | 0.21 | | 0.22 | | 0.28 | | 0.00 | | 0.34 | | 0.29 | |
| t Critical one-tail | 1.76 | | 1.80 | | 1.76 | | 1.76 | | 1.76 | | 1.73 | | 1.76 | | 1.76 | |
| P(T<=t) two-tail | 0.14 | | 0.12 | | 0.41 | | 0.45 | | 0.56 | | 0.01 | | 0.67 | | 0.57 | |
| t Critical two-tail | 2.14 | | 2.20 | | 2.14 | | 2.14 | | 2.14 | | 2.10 | | 2.14 | | 2.14 | |
| **Result:** | **Equivalent variance and mean** | | **Lower variance and equivalent mean** | | **Equivalent variance and mean** | | **Equivalent variance and mean** | | **Lower variance and equivalent mean** | | **Equivalent variance and mean** | | **Equivalent variance and mean** | | **Equivalent variance and mean** | |
| **Conclusion:** | **No significant difference** | | **No significant difference** | | **No significant difference** | | **No significant difference** | | **No significant difference** | | **No significant difference** | | **No significant difference** | | **No significant difference** | |