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the renewable energy business

GENERATION DIVISION
Production Group

EnMax, Weather Modification

WM-Instruction-P01/04 Airborne Evaluation of Cloud Conditions

REV	REVISION DESCRIPTION	DESCRIPTION	REVIEWED	DATE
0	Original Issue 15/07/2003	Condition monitoring and seeding track placement instructions.		
1	October 2003	Review	CN	

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[redacted]
July 2003

1. Description

This instruction describes the necessary steps to evaluate cloud conditions for cloud seeding suitability once airborne and steps to initiate cloud seeding.

2. Detail

It is only possible to classify cloud as suitable or unsuitable for seeding during a flight as vital parameters are measured on location in cloud. Cloud Seeding Officers are therefore encouraged to initiate a flight if only to assess conditions to confirm them unsuitable. It can be surprising at times to find conditions contrary to expectations.

3. Cloud Monitoring

Once aloft, monitoring of conditions is done in 3 ways and continues until a decision is made of cloud suitability –

3.1 BOM information on weather condition

A laptop computer on board has been set up for Internet access via the Telstra CDMA network[1] so the usual Internet services can be accessed, ie satellite images, radar, MSL analysis etc.

3.2 Physical Parameters

On board instruments to accurately measure and display ambient air temperature, dew point temperature, liquid water content and an indicator of relative humidity

3.3 Visual observations

Visual observations of clouds noting type, base and top levels, amount, degree of compactness and phase of water composition (either liquid or ice)

- **Night flights** - .....

A cloud seeding flight initially will follow a set procedure to determine cloud conditions. During each flight a detailed log is manually recorded by the CSO. Data recording systems on board record and display a host of parameters from both aircraft systems and externally mounted probes. (See WM-Procedure-02 Recording Parameters In-flight)

4. Wind Finding and Navigation

A basic navigational task is performed so that the aircraft is located in the correct position to assess cloud suitability for the catchment area targeted. This area, known as the proposed seeding track, will be a track perpendicular to the wind vector. Wind speed and direction is displayed by the data recording system. It is calculated using a number of aircraft systems being, ambient air temperature, altitude, indicated air speed, heading, global positioning system (GPS) generated ground speed and GPS ground track. Wind speed and direction aloft requires to be fairly accurately defined as the seeding track location is wholly dependent on it.

4.1 Defining the seeding track
The proposed seeding track can be defined in two ways, both are valid and result in very similar definitions.

4.1.1 A program on the laptop computer can be used to define seeding track coordinates[2]. It prompts users for inputs of wind speed, wind direction, altitude and target area. Results can be printed and passed on to the pilot.

4.1.2 The second method is to manually draw the wind vector onto a laminated World Aeronautical Chart (WAC) and note the latitude and longitude coordinates for use by the pilot. From temperature soundings on climb, an appropriate altitude is nominated for the proposed seeding track.

The pilot uses the information to obtain a clearance from Air Traffic Control and for GPS positioning of the aircraft.

4.2 Seeding track location criteria are summarised below -

4.2.1 **Displacement:** For both stratiform and cumulus cloud, the seeding track displacement will be minimum 30 minutes of wind speed upwind of the upwind boundary of the target area. Use discretion in plotting the seeding track and feel free to modify the programmed track placement if you have good reason to do so. However note in the log book any departures from standard procedure.

4.2.2 **Length:** Normally, the seeding track length should be the width of the target area less 5% for every 10 knots of wind speed. For example, in a 40 knot wind the seeding track will be 80% as long as the target area is wide.

4.2.3 **Alignment:** The seeding track alignment should be approximately parallel to the upwind boundary of the target area and perpendicular to the wind vector but this may vary a little to simplify navigation.

5. Assessment of Cloud
Once the aircraft is established on the seeding track at an appropriate altitude, cloud suitability is finally assessed using both physical cloud parameters and visual observations. Suitable cloud conditions are those where cloud meet predefined criteria and when wind speed is less than 70 knots.

Minimum cloud suitability criteria are summarised below -

- Cloud depth to exceed half the terrain clearance of the cloud base.
- Cloud top temperature, -6°C or colder for stratiform cloud, -8°C for CuSC, -10°C for Cumulus.
- Cloud compactness – Clouds composed only of thin layers or patchy lumps are not suitable. Similarly cumulus cells which lean over so that tops are not vertically aligned above the bases are not suitable.

- Cloud LWC - minimum 0.1 gm^{-3} for St, >0.1 gm^{-3} for CuSC, 0.5 gm^{-3} for Cu, (in each case averaged over 30 seconds)
- Cloud composition – few or no ice crystals in cloud at seeding level. If LWC is low and ice crystal counts are high, do not seed.

6. Cloud Seeding

If suitable cloud is encountered, seeding can commence and continue for as long as suitable conditions persist (for instructions on 'Adjusting to changing conditions' see WM-Instruction-P0105). Cloud Seeding will continue until the aircraft has to depart to melt off air frame ice, or the seeding solution supply is exhausted or the aircraft reaches the flying time limit.

7. Notes

[1] *Aircraft Internet Access* by [redacted]
\\swhhob2\planinv$\CLOUDS\~TACSE_4\Admin\CS_InfoFolder\2002-Season\Instrumentation\Aircraft Internet Access.doc
[redacted] has written notes on how to gain Internet access using the aircraft laptop computer.

[2] *Seeding Track Calculator* by [redacted]
\\swhhob2\planinv$\CLOUDS\~TACSE_4\Admin\CS_InfoFolder\2002-Season\Instrumentation\Seeding Track Calculator.doc
User documentation to a program [redacted] has written that uses the aircraft laptop computer to calculate latitude and longitude coordinates of a seeding track based on user inputs. The program sets the seeding track ½ hour upwind of the selected target area's upwind boundary. After calculating the track there is a print option to send output to a printer in the aircraft. The pilot can use the printout to inform air traffic control of the area of air work.

2.

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WM-Instruction-P01/05 Adjusting to Changing Conditions

REV	REVISION DESCRIPTION	DESCRIPTION	REVIEWED	DATE
0	Original Issue 15/07/2003	Response by CSO to changes in meteorological conditions..		
1	October 2003	Review	CN	

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July 2003

1. Description
This instructions describes the possible changes in conditions which will affect cloud seeding and the actions a Cloud Seeding Officer has to take to adjust to changes.

2. Changing Conditions – Pre Flight
While a Cloud Seeding Officer is rostered as the Duty Officer, a high degree of flexibility is required so that a flight can be initiated when required. At times flights will be necessary before or after daylight as well as on weekends. Therefore a Duty CSO will have to have a well-organised home life and accept the fact that while on duty, capturing weather events must be the first priority.

3. Changing Conditions – Suitable Conditions
The atmosphere is an ever-changing environment, and at times it can change very quickly, particularly where wind speeds in excess of 50 knots occur. The CSO may be faced with the need to continually change the flight plan, sometimes changing it within minutes of having notified the pilot of intentions. *(A typical example will be while seeding in frontal cloud of suitable proportions and suddenly breaking out into clear blue skies at the rear edge of the frontal cloud band. The seeding comes to a sudden end.)*

Less obvious however, are the subtle changes to cloud, temperature and wind conditions that are always occurring. The CSO must be alert to these changes and compensate accordingly.

The aircraft too must be considered to be a changing entity. The presence of airframe ice and the depletion of fuel will affect the CSO's decisions and the operational planning. All these must be included in the planning process to maximise the effectiveness of the seeding in the time available.

The following is a list of some of the changeable conditions affecting flight planning, and the corrective action required.

• Increasing or decreasing wind speed	➢ adjust seeding track displacement
• Changing wind direction	➢ adjust seeding track orientation
• Changing temperature at seeding level	➢ climb or descend to maintain temperature
• Falling SLWC levels in cloud	➢ seek out more suitable cloud if possible
• Change of cloud type (eg. St to Cu)	➢ change seeding method to suit
• Change of cloud composition (LW to ice)	➢ reassess seeding suitability
• Presence of Cb (hail, lightning)	➢ use radar to avoid cells by changing track
• increasing ice load on aircraft	➢ prepare to descend to melt off ice
• sudden and severe icing	➢ move track to safer area, prepare to descend

- low fuel supply or seeding solution
- severe turbulence

➢ prepare to land and refuel

➢ change seeding level or track

4. Changing Conditions – Unsuitable Conditions

If conditions are deemed to be unsuitable the CSO has to make a decision as to where to direct the aircraft. Possible choices are –

- ➢ Remain aloft and check a different target area.
  This should always be the first option!
- ➢ Assess conditions further upwind of the most likely catchment area to receive cloud given the current meteorological conditions
- ➢ Return to an airfield close to the catchment most likely to receive cloud given the current meteorological conditions
- ➢ Return to base (i.e. Hobart airport)

Conditions of each flight will dictate which path the CSO will choose to follow.

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WM-Instruction-P01/07 Cloud Seeding Operation when Flood Warnings are in place

REV	REVISION DESCRIPTION	DESCRIPTION	REVIEWED	DATE
0	Original Issue 18/09/2003	Overview, explanation and index of procedure documents.	[redacted]	18/09/2003
1	26/09/2003	Updated BoM flood warning Web link	[redacted]	26/09/2003
2	October 2003	Review	[redacted]	
3	May 2013	Updated BoM flood warning Web link Updated formatting	[redacted]	17/05/2013

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September 2003

Cloud Seeding Operation when Flood Warnings are in place

Description

This procedure contains guidelines for where cloud seeding operation may take place when the various levels of flood warning from the Bureau of Meteorology are in place.

Details

The cloud seeding referee will monitor flood warnings and adjust cloud seeding target areas as follows:

- Flood Watch or Minor Flood Warning – no adjustment to cloud seeding target areas required
- Moderate or Major Flood warning:
    - Suspend cloud seeding activities in any target area with rivers with this status
    - Restrict activities in a target area with an adjacent catchment with rivers with this status to:
        - No cloud seeding if the adjacent catchment in flood is downwind of the seeding track
        - Place the seeding track either on the boundary with the adjacent catchment in flood, or inside the cloud seeding target area, if the adjacent catchment in flood is upwind

The notification of the cloud seeding referee will include available target areas, any relevant flood warnings and the target areas they affect. It is the responsibility of the cloud seeding officer on duty to then act in accordance with the above guidelines.

In addition it would be prudent for the duty cloud seeding officer to check the status of flood warnings before seeding target areas. A summary of current warnings is available on the Flood Warning section of the Bureau of Meteorology Web site:

http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDT20600.html

A record of actual or potential opportunities lost due to the restrictions of this policy should be maintained in the cloud seeding group.

2 FLOOD LOADING DAM SAFETY EVENT

The spillways on Hydro Tasmania's dams have been designed to pass extremely rare flood events. A dam's safety, however, may become inadequate if a critical flood exceeds the spillway capacity, overloads the dam, physically damages the dam or erodes the foundations.

Extreme floods not exceeding dam crest level also have the potential to threaten dam safety:

- Landslips could occur either on the dam embankment itself, the abutments or around the reservoir rim.
- Large debris could damage or block the spillway.
- Leakage paths could develop through the dam embankment or foundations, which could develop into a piping failure.

Hydro Tasmania has developed a *flood warning system* for Hydro Tasmania's dams. The purpose of the flood warning system is to provide early warning of flood conditions at the dams. A full description of the flood warning system is provided in section 8 of the DSEP.

The Dam Safety Manager may trigger a flood loading dam safety event when:

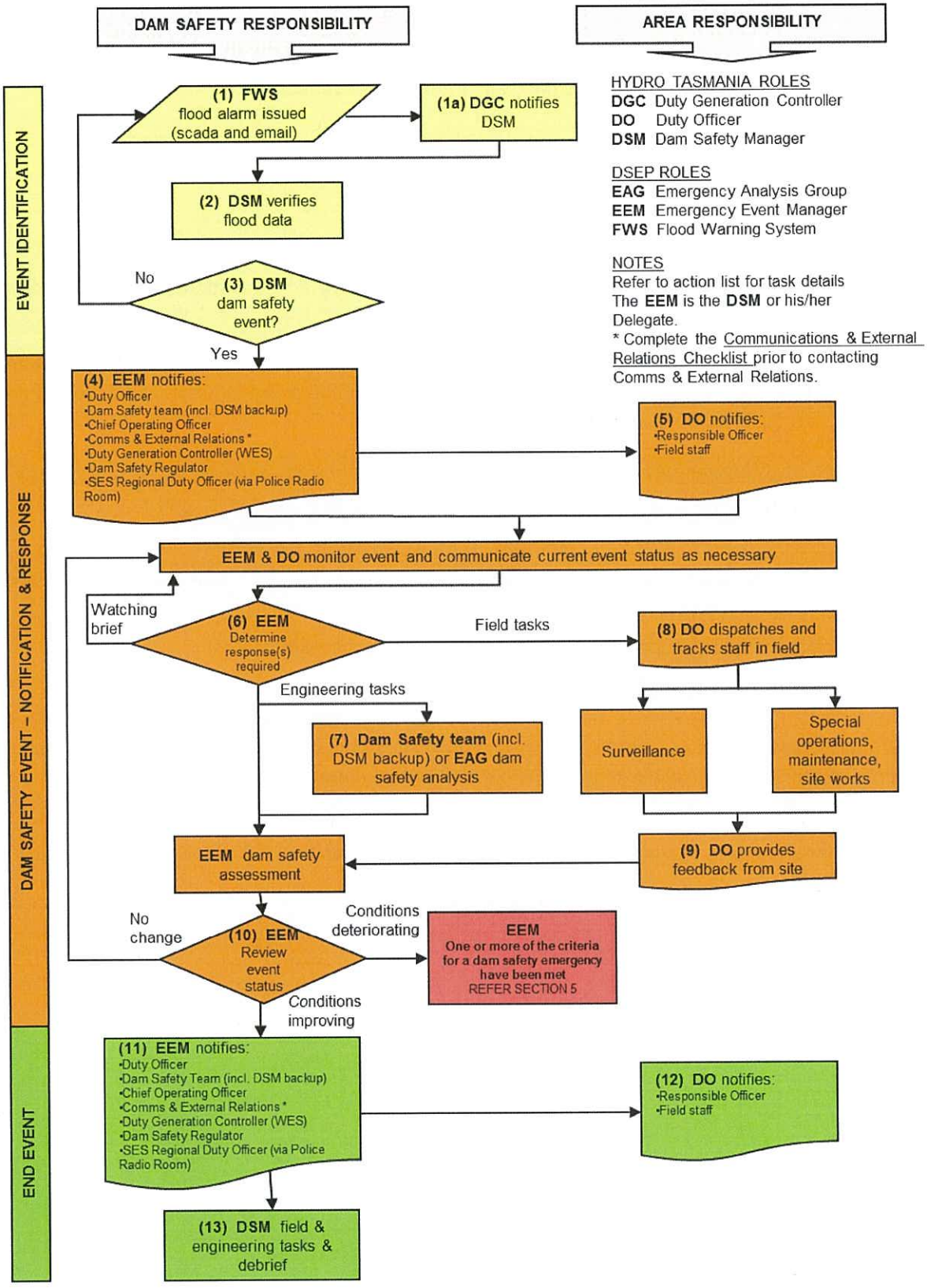
- The storage level at a dam is forecast to exceed the storage level for the 1:20 annual exceedance probability (AEP) spill event (refer Table 8-8-1 in section 8).
- The storage level at a dam approaches the historic high (i.e. 80% of the spill that is required to achieve the historic high) (refer Table 8-8-2 in section 8).
- The safety of a dam under flood loading is otherwise of concern.

Note that floods may affect a number of dams simultaneously.

The chosen triggers do not necessarily represent a danger to the dams or spillways, however such flood events do represent unusual loading on the dams. Internal notifications and responses to such loading conditions represent prudent dam safety management.

The response to a flood loading dam safety event is detailed on the following flowchart and action list.

FLOOD LOADING DAM SAFETY EVENT RESPONSE FLOWCHART



No	Initiator(s)	Action	Recipient(s)
1	• Flood warning system	**Flood alarm issued:** • The flood warning system is detailed in section 8 of the DSEP. • The flood warning system automatically triggers alarms when alarm levels are reached. • The flood warning system outputs a number of graphs depicting: – A historical time-series of actual spills and storage levels. – 48-hour forecast rainfall from the BoM. – A forecast time-series of spills and storage levels using forecast and real-time rainfall. – Full supply level, design flood level, design spill capacity, alarm levels and alarm spill discharges.	• Duty Generation Controller's SCADA screen. • Email and SMS to designated recipients. • Relevant contact details are managed by the Dam Safety Team, Assets & Infrastructure.
1a	• Duty Generation Controller	**Notify Dam Safety Manager:** • For the purpose of the Hydro Tasmania DSEP, the role of Dam Safety Manager (DSM) is filled by the first available candidate on the Dam Safety Manager Opportunity Roster (DSMOR) found in Section 6. • Verbal contact must be made with the Dam Safety Manager (or next available candidate on the DSMOR) to notify them of flood alarm.	• Dam Safety Manager (or next available candidate on the DSMOR)
2	• Dam Safety Manager	**Verify flood data:** • The outputs from the flood warning system may be verified using the following sources of information: – The flood forecast plots are provided on the *Dam Safety – Home Page:* http://hydroapps/dam_safety/. – The flood forecast plots are also available in *Hydstra* in the 'System Control/Forecasts' folder in the 'Hydstra TSM Favourites' list. – *Hydstra* also provides actual rainfall at key sites around Tasmania, forecast regional rainfall (from the BoM) and inflow forecasts. – The BoM's website http://www.bom.gov.au/hydro/flood/tas shows river conditions, 24 hour rainfalls, since 9 am rainfalls and last 1 hour rainfalls throughout Tasmania. – Unusual or inconsistent results may be checked with the Duty Generation Controller, the Duty Hydrographer and/or the BoM.	• Duty Generation Controller • Duty Hydrographer • BoM

No	Initiator(s)	Action	Recipient(s)
3	• Dam Safety Manager	**Dam Safety Manager notifies all DSMORs** The Dam Safety Manager notifies those on the DSMOR that they are dealing with the situation. A SMS text shall be sent to those on the DSMOR. **'Dam Safety alert received 'NAME' is EEM'.** Refer to Dam Safety Manager Opportunity Roster (DSMOR) for contact details.	• Dam Safety Manager Opportunity Roster (DSMOR)
4	• Dam Safety Manager	**Should a dam safety event be triggered?:**	
		• A flood loading dam safety event may be triggered if any of the following occur: – The storage level at a dam is forecast to exceed the storage level for the 1:20 annual exceedance probability (AEP) spill event. – The storage level at a dam approaches the historic high (i.e. 80% of the spill that is required to achieve the historic high). – The safety of a dam under flood loading is otherwise of concern. • The declaration of a flood loading dam safety event is at the discretion of the Dam Safety Manager.	
		• If event not triggered: – Notify Duty Generation Controller of Dam Safety intention to monitor and/or await next level of flood alarm. – Notify Duty Officer of flood imminent, but not currently of dam safety concern.	• Duty Generation Controller • Duty Officer
5	• Emergency Event Manager	**Notify internal and external stakeholders (EEM):**	
		• Once a flood loading dam safety event has been triggered, the Dam Safety Manager, or his/her delegate, assumes the role of Emergency Event Manager. • It is the responsibility of the Emergency Event Manager to maintain a 'Communication Log' of the entire event including all communications, decisions made and incidents reported. – A hardcopy of the template is located in section 7 and an electronic copy is available on the Dam Safety – Home Page: http://hydroapps/dam_safety/.	

No	Initiator(s)	Action	Recipient(s)
		• Prepare 'Flood Loading Dam Safety Message' with all known information about the event. – A hardcopy of the template is located in section 7 and an electronic copy is available on the Dam Safety – Home Page: http://hydroapps/dam_safety/.	
		• Notify relevant internal and external stakeholders of flood loading dam safety event to provide an early warning and enable preparations for possible future responses: – Email 'Flood Loading Dam Safety Message'. – Phone to confirm receipt of message (at a minimum phone those with follow-on actions or responsibilities under the DSEP). – Complete the 'Communications & External Relations Communication Checklist 'prior to contacting Communications & External Relations.	• Duty Officer • Dam Safety team • Chief Operating Officer • Communications & External Relations • Duty Generation Controller • SES Regional Duty Officer (for relevant region) • Dam Safety Regulator (courtesy notification)
		• Advise Chief Operating Officer in accordance with Appendix B of the *State Owned Energy Business Emergency Management Plan*.	• Chief Operating Officer
6	• Duty Officer	**Notify internal stakeholders (DO):** • Notify relevant internal stakeholders of flood loading dam safety event to provide an early warning and enable preparations for possible future responses: – Email 'Flood Loading Dam Safety Message' prepared by the Emergency Event Manager. – Phone to confirm receipt of message. • It is the responsibility of the Duty Officer to maintain a 'Communication Log' of all their communications, decisions made and incidents reported. – A hardcopy of the template is located in section 7 and an electronic copy is available on the Dam Safety – Home Page: http://hydroapps/dam_safety/.	• Responsible Officer • Field staff

No	Initiator(s)	Action	Recipient(s)
7	• Emergency Event Manager	**Determine response(s) required:**	
		• Field tasks: – Determine appropriate field tasks (i.e. surveillance, special operations, maintenance, site works). – Prepare 'Prioritised Dam Safety Responses' message with relevant instructions. – A hardcopy of the template is located in section 7 and an electronic copy is available on the *Dam Safety – Home Page:* http://hydroapps/dam_safety/.	
		– Notify the Duty Officer of prioritised dam safety responses: email 'Prioritised Dam Safety Responses' message and phone to confirm receipt of message.	• Duty Officer
		• Engineering tasks:	
		– Assemble and direct the Dam Safety team (as required) to provide research, analysis and decision-making support.	• Dam Safety team
		– Establish and direct the Emergency Analysis Group (EAG) (as required) to assess current and potential risks and provide prioritised mitigation measures and event management strategies.	• At the discretion of the Emergency Event Manager and will depend on the nature of the event and the expertise required.
		• Watching brief: – Continue to monitor the event.	
8	• Dam Safety team or EAG	**Undertake dam safety analysis:**	
		Dam Safety team • The Emergency Event Manager will provide direction on the engineering tasks required. • The Dam Safety team can provide research, analysis and decision-making support.	• Emergency Event Manager
		Emergency Analysis Group (EAG) • The Emergency Event Manager will chair the EAG and provide direction on the engineering tasks required. • The purpose of the EAG is to assess current and potential risks and provide prioritised mitigation measures and event management strategies.	• Emergency Event Manager

No	Initiator(s)	Action	Recipient(s)
9	• Duty Officer	**Dispatch and track staff in field:** • Notify Responsible Officer or Line Manager prior to dispatching field staff on site inspections. • Ensure the safety of Hydro Tasmania field staff whilst in the field. • Do not allow field staff to inspect underground unless approved by the Emergency Event Manager. • Ensure that field staff exercise extreme caution during night time inspections as conditions may have changed as a result of the flood.	• Field staff
10	• Duty Officer	**Provide feedback from site:**	
		• Provide feedback on dam site conditions to Emergency Event Manager by phone. If EEM requests direct feedback from field staff, the DO must be notified of communications between EEM and field staff.	• Emergency Event Manager
		• Prepare 'Dam Condition Report' message based on information provided from field staff. • A hardcopy of the template is located in section 7 and an electronic copy is available on the *Dam Safety – Home Page:* http://hydroapps/dam_safety/. • Email 'Dam Condition Report' to Emergency Event Manager.	• Emergency Event Manager

No	Initiator(s)	Action	Recipient(s)
11	• Emergency Event Manager	**Review the event status:** • Conditions deteriorating: – Has the dam exceeded its flood capacity? Dam flood capacities are available for each of Hydro Tasmania's dams on the *Dam Safety – Home Page:* http://hydroapps/dam_safety/ under 'Dam Summary Information'. The *Dam Portfolio Risk Assessment* engineering assessments also provide flood overtopping system response curves relating storage level to probability of failure. – Has a major structure or significant component failed or is failure likely? – Has there been a damaging uncontrolled release of stored water or is such a release imminent? – Are the emergency response agencies required to become involved in the management of the incident? – Is the requirement to manage the incident beyond the capability (operationally, technically or financially) of Hydro Tasmania's resources? **If yes to any of these, trigger a dam safety emergency.** • No change to conditions: – Are flood conditions above, or forecast to remain above trigger levels? – Are ongoing field tasks or engineering tasks required and is it prudent to continue preparations for possible future responses? – Does the safety of the dam remain uncertain? **If yes to any of these, continue to monitor the event.** • Conditions improving: – Is the safety of the dam satisfactory? – Is the flood receding? – Is the level at the dam below the alarm level? **If yes to any of these, end the event.**	

No	Initiator(s)	Action	Recipient(s)
12	• Emergency Event Manager	**Notify internal stakeholders of end of event (EEM):**	
		• Prepare 'Flood Loading Dam Safety Message' indicating the end of the event. – A hardcopy of the template is located in section 7 and an electronic copy is available on the Dam Safety – Home Page: http://hydroapps/dam_safety/.	
		• Notify relevant internal stakeholders of end of flood loading dam safety event: – Email 'Flood Loading Dam Safety Message'. – Phone to confirm receipt of message (at a minimum phone those with follow-on actions or responsibilities under the DSEP). – Complete the 'Communications & External Relations Communication Checklist 'prior to contacting Communications & External Relations.	• Duty Officer • Dam Safety team • Chief Operating Officer • Communications & External Relations • Duty Generation Controller • SES Regional Duty Officer (for relevant region) • Dam Safety Regulator (courtesy notification)
13	• Duty Officer	**Notify internal stakeholders of end of event (DO):** • Notify relevant internal and external stakeholders of end of flood loading dam safety event: – Email 'Flood Loading Dam Safety Message' prepared by the Emergency Event Manager. – Phone to confirm receipt of message.	• Responsible Officer • Field staff
14	• Dam Safety Manager	**Request field and engineering tasks and debrief:**	
		• Request any appropriate field tasks (i.e. surveillance, special operations, maintenance, site works).	• Duty Officer
		• Undertake dam safety 'special' engineering inspection.	• Dam Safety team
		• Undertake dam safety event debrief in accordance with Section 10.	• Refer Section 10.

5.

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Hydro-Electric Corporation Board Paper

Corporation Meeting 27 July, 2016

Strictly Confidential

[RESTRICTED CIRCULATION]
PRIVILEGED AND CONFIDENTIAL

Agenda Item: 8.1

Subject: **JUNE 2016 FLOOD EVENT – LEGAL UPDATE**

Sponsor: General Counsel

Category: [redacted]

Draft Resolution: [redacted]

[redacted]

This paper, which follows on from the verbal update provided at the June 2016 Corporation meeting, has been prepared with assistance from Page Seager, for the dominant purpose of providing legal advice to the Board. [redacted]

Confidential and subject to Legal Professional Privilege

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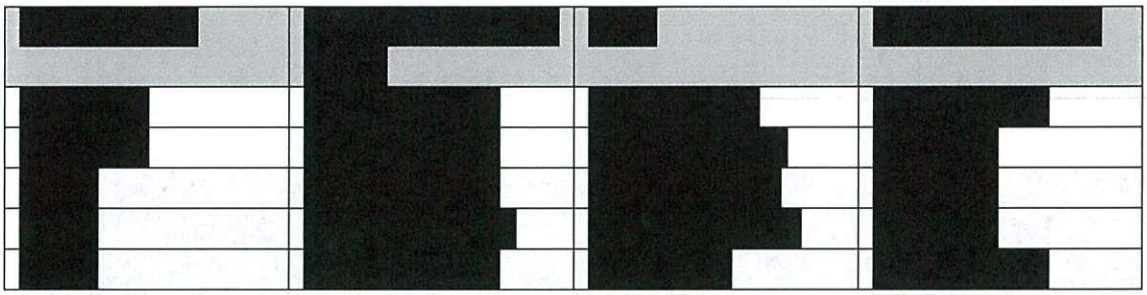

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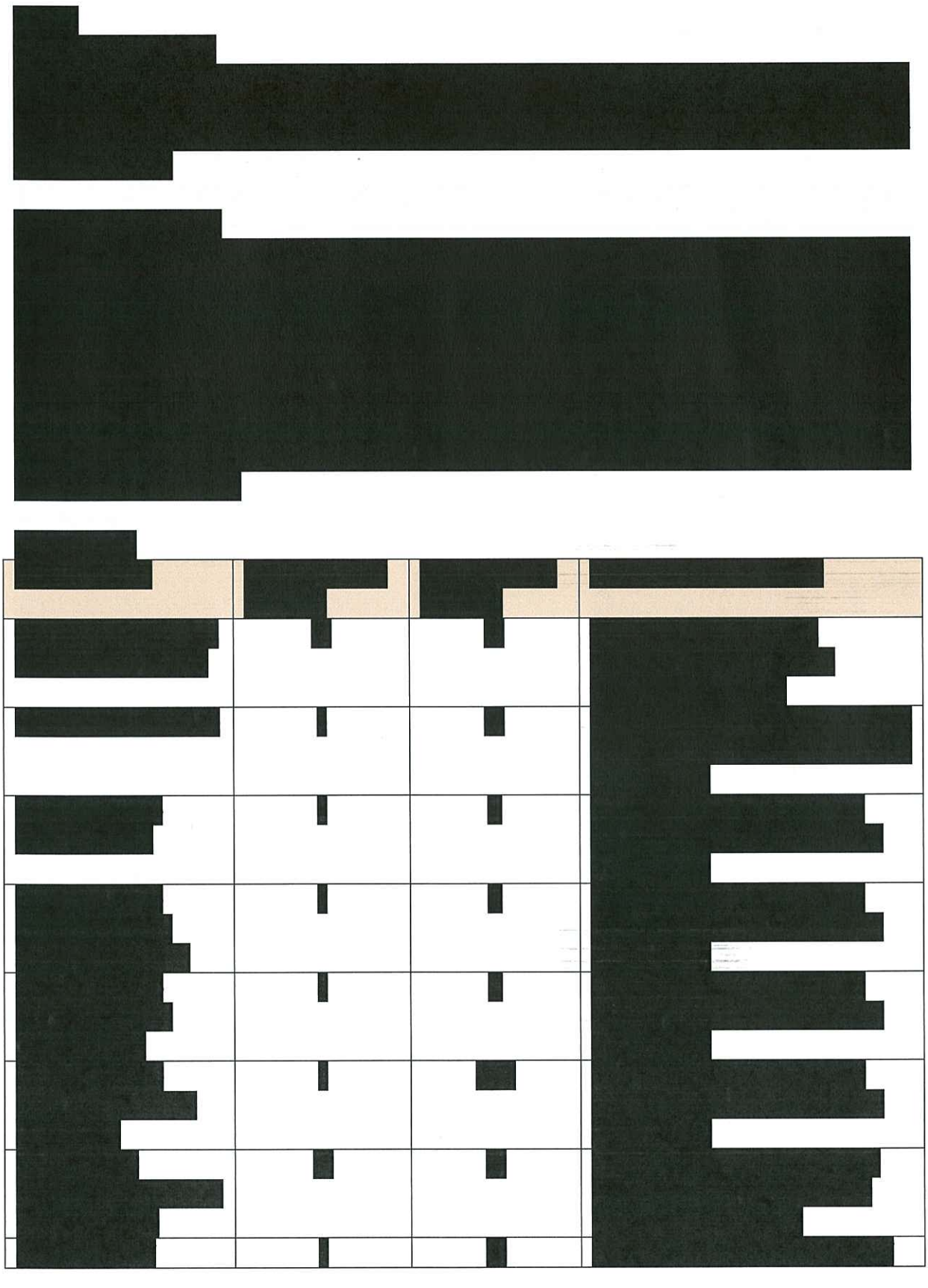

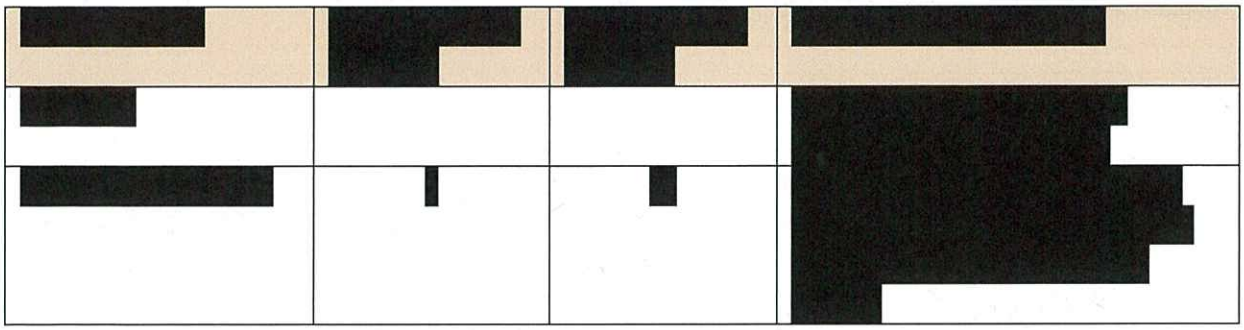

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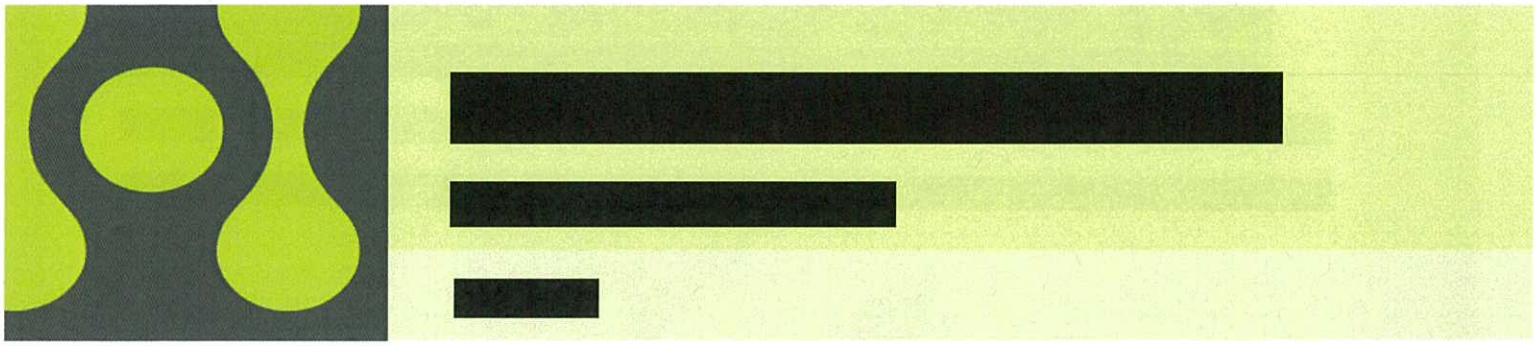

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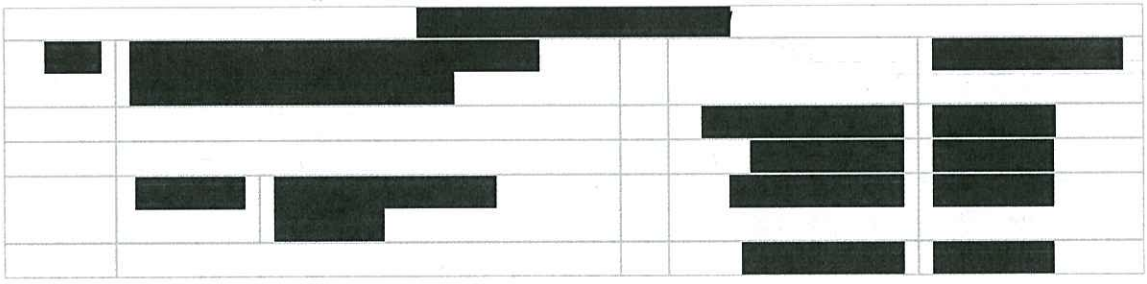

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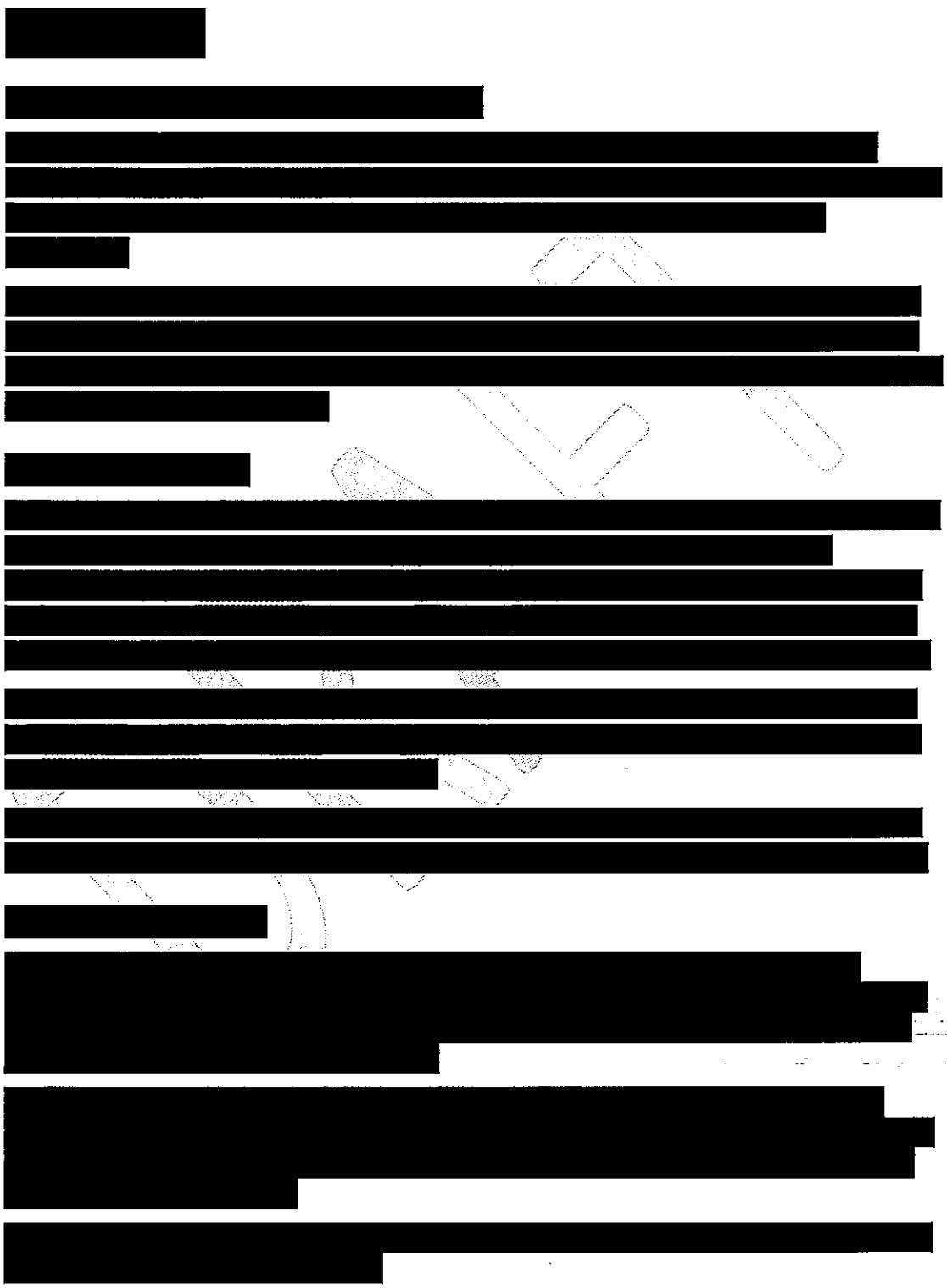

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Cloud seeding flight of 5 June 2016

Background and event final report

27 July 2016

Contents

Hydro Tasmania Standard				
Title:	**Cloud Seeding Flight of 5 June 2016 – Background and event final report**			**Version 1.0 draft**
			Document Owner:	[redacted]
			Date Created:	**27 July 2016**
	Approver: **CEO,** [redacted]		***Date Approved:***	**27 July 2016**
			Date Effective:	**27 July 2016**

Statement of Purpose

This report has been prepared by Hydro Tasmania for the purpose of advising the Minister for Energy of Hydro Tasmania's decision making process for, and impact of, the cloud seeding flight that Hydro Tasmania undertook on 5 June 2016.

Executive Summary

[redacted]

[1] [redacted]

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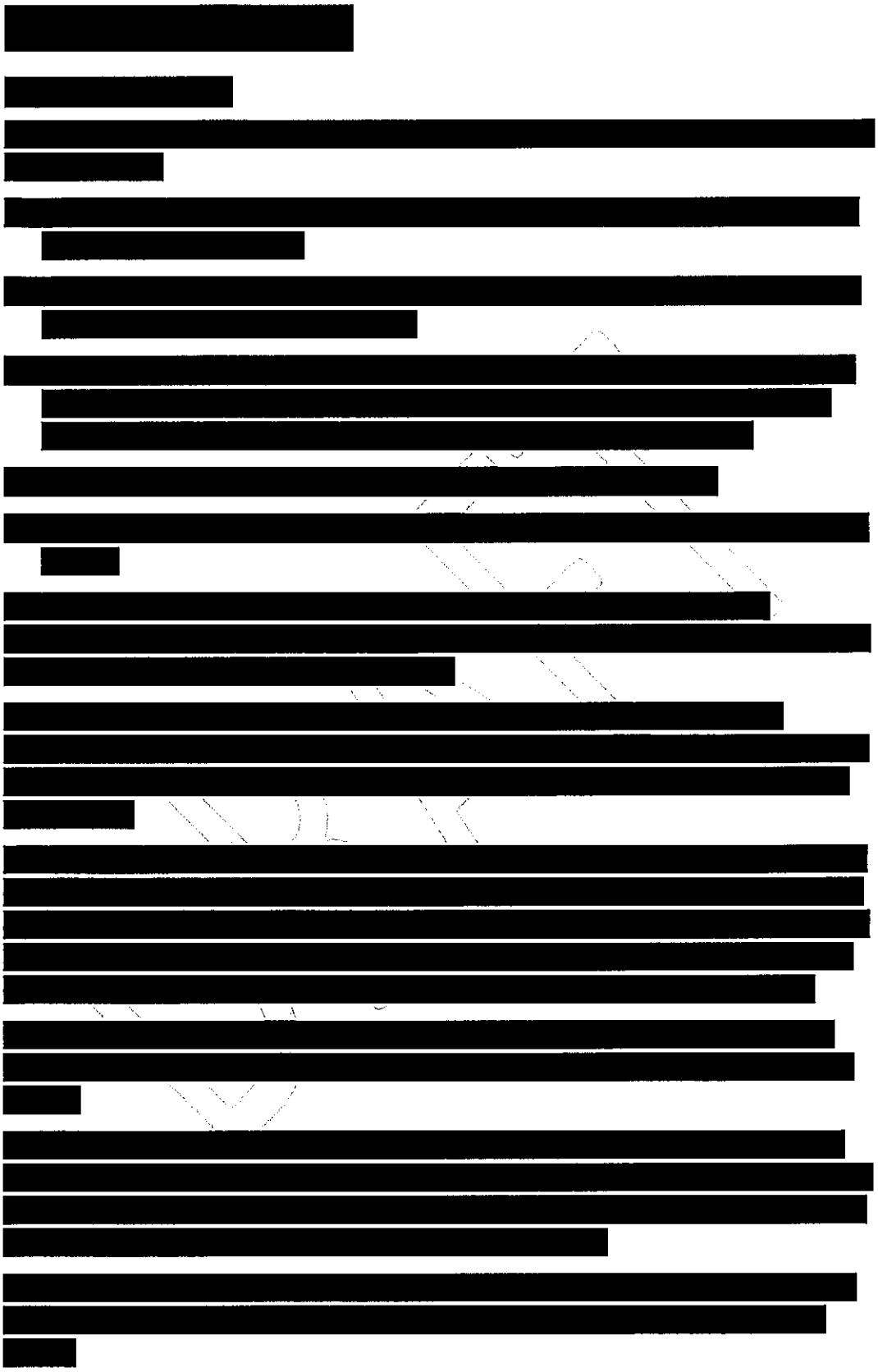

Hydro Tasmania
The power of natural thinking

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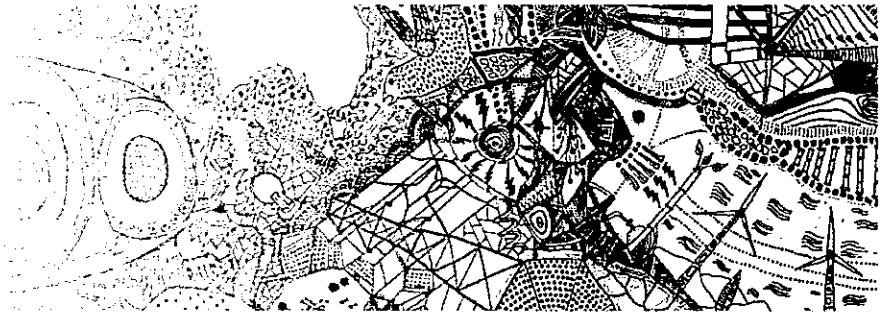
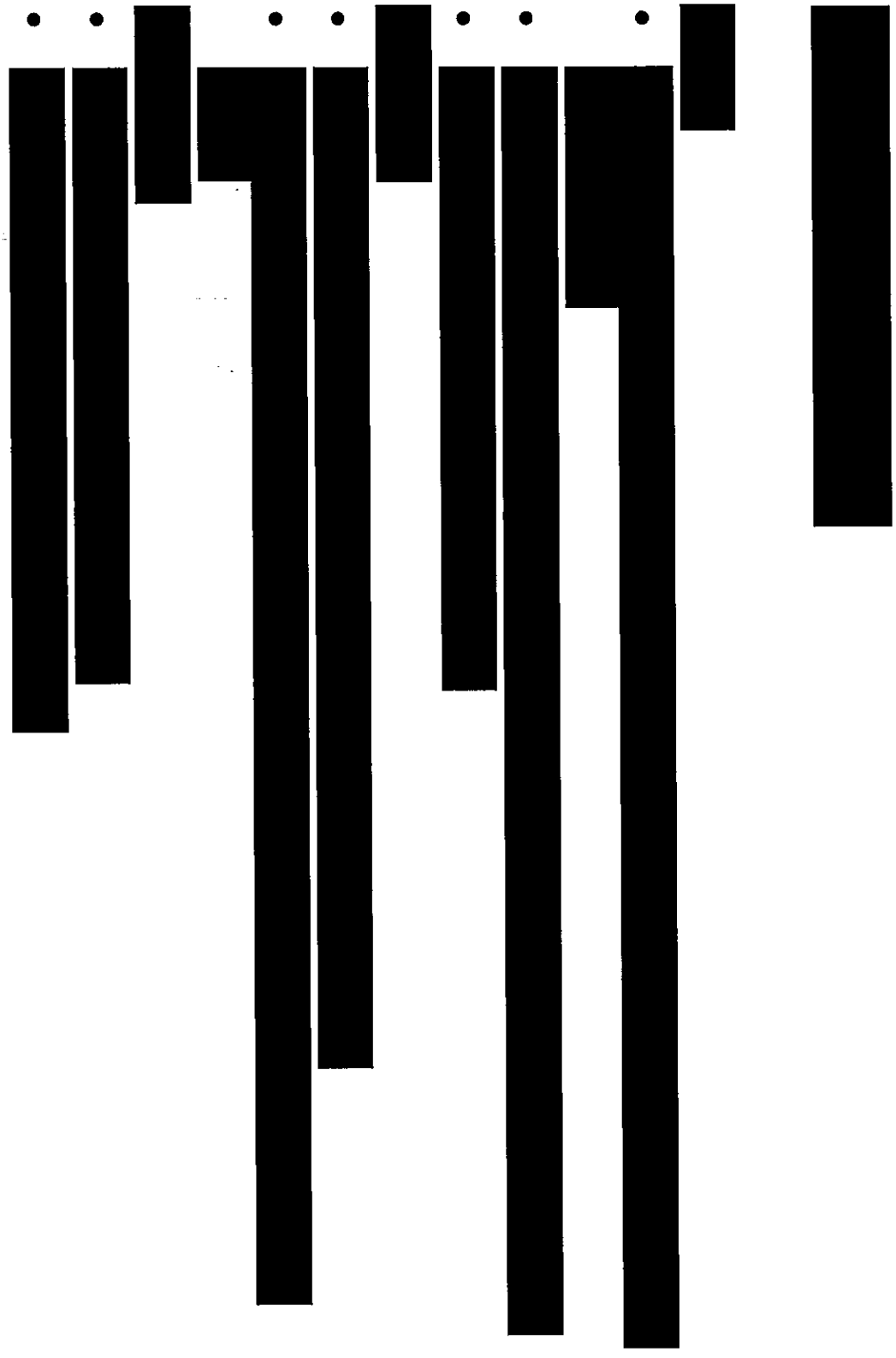
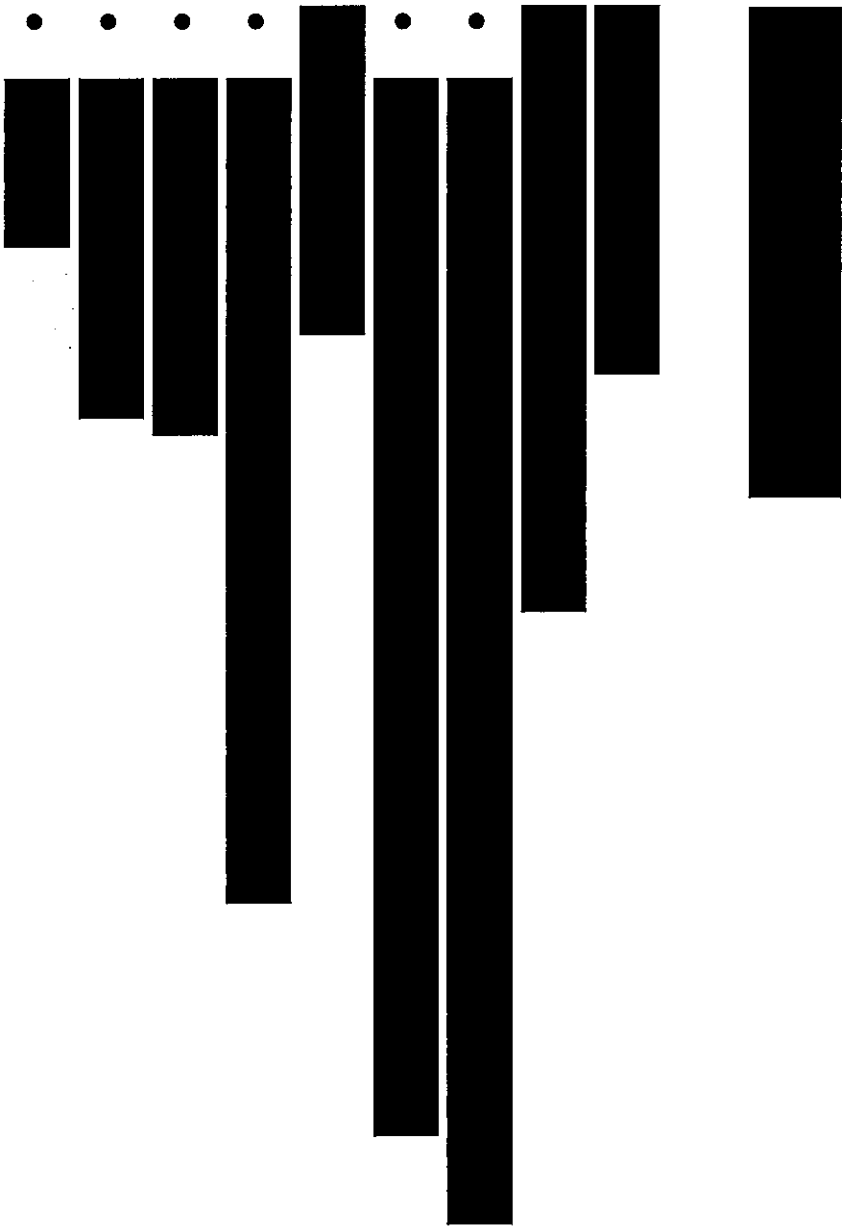


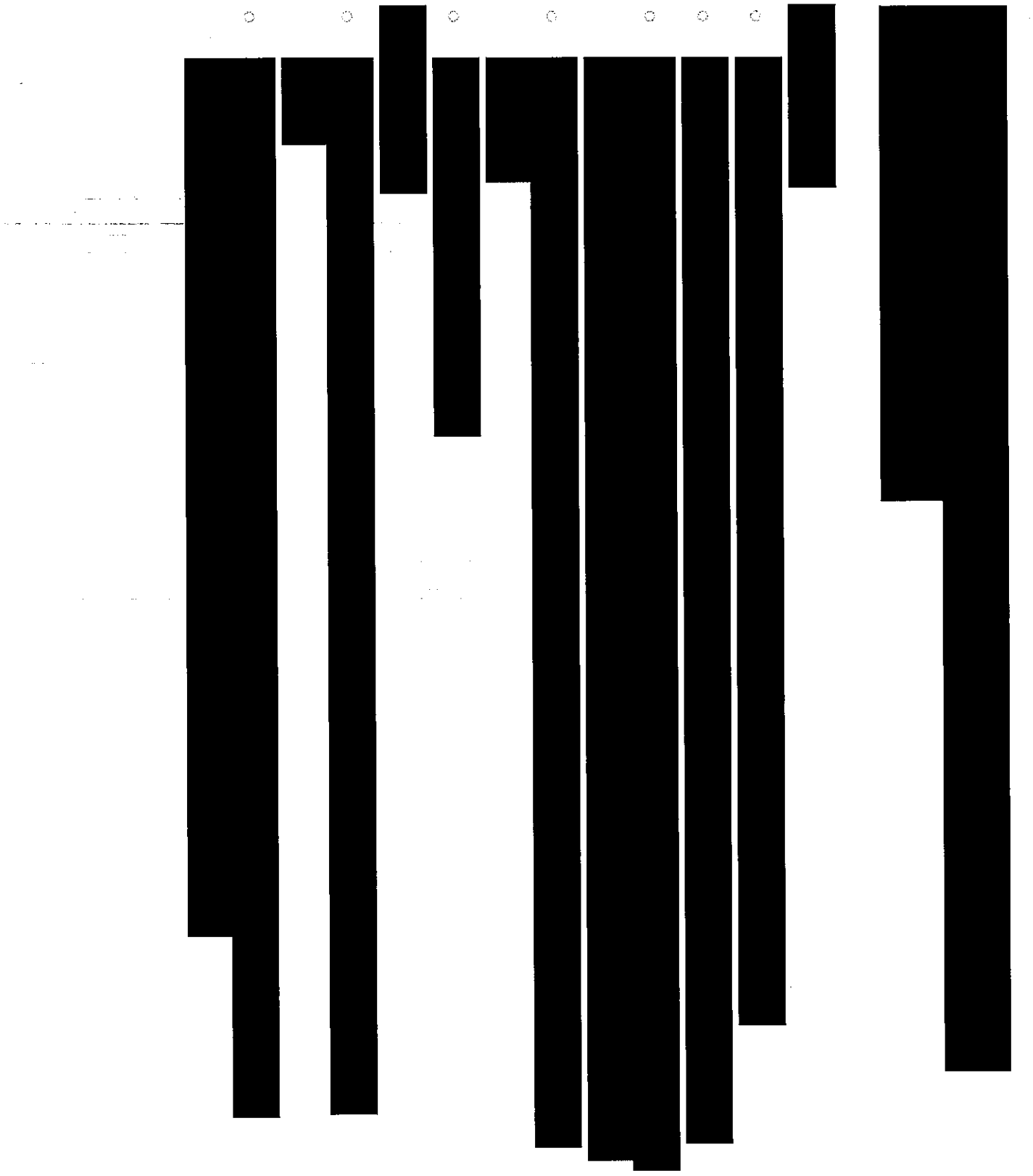
Cloud seeding update
July 2016

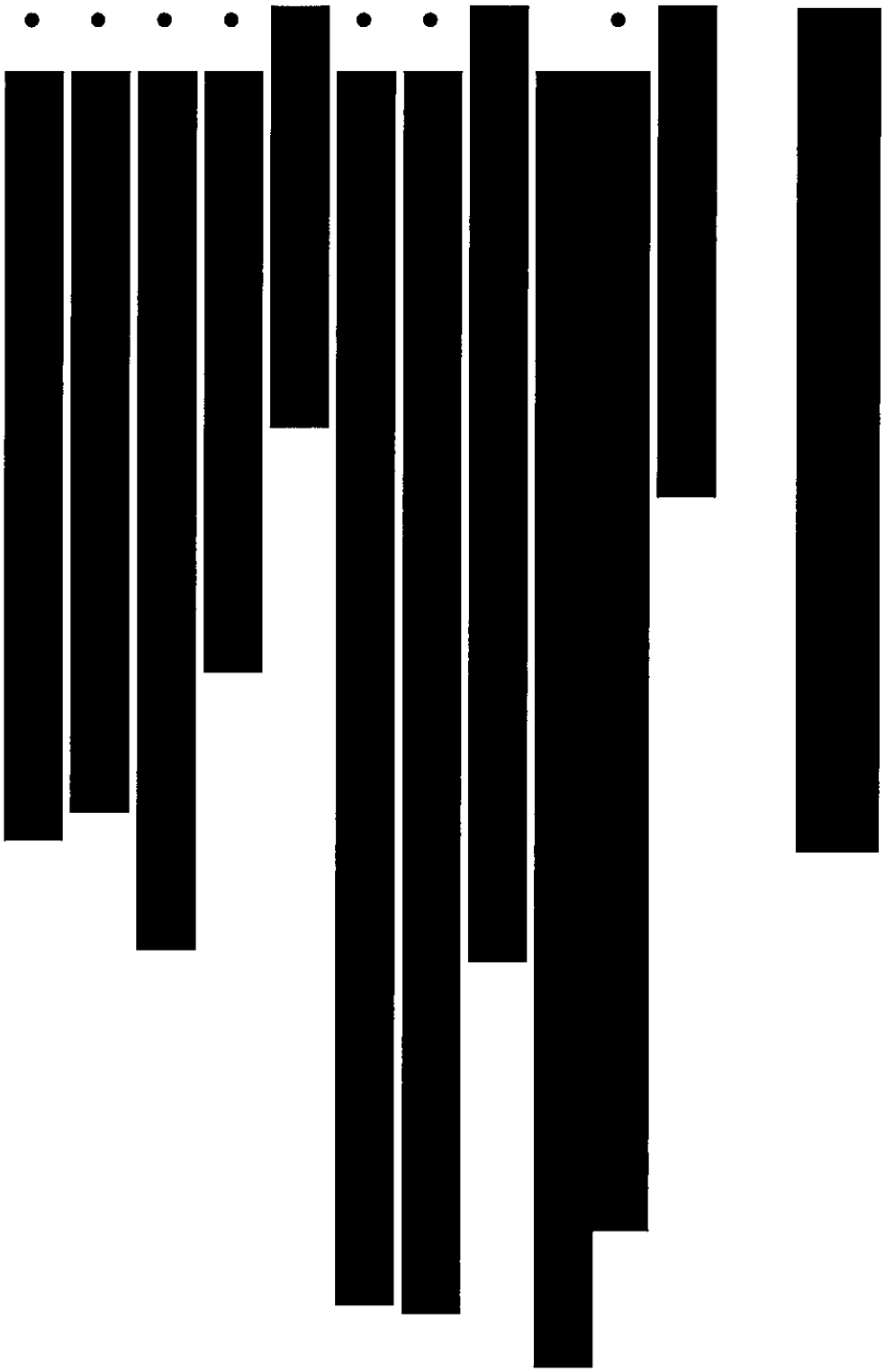
27 July 2016 Board meeting
Subject to legal professional privilege

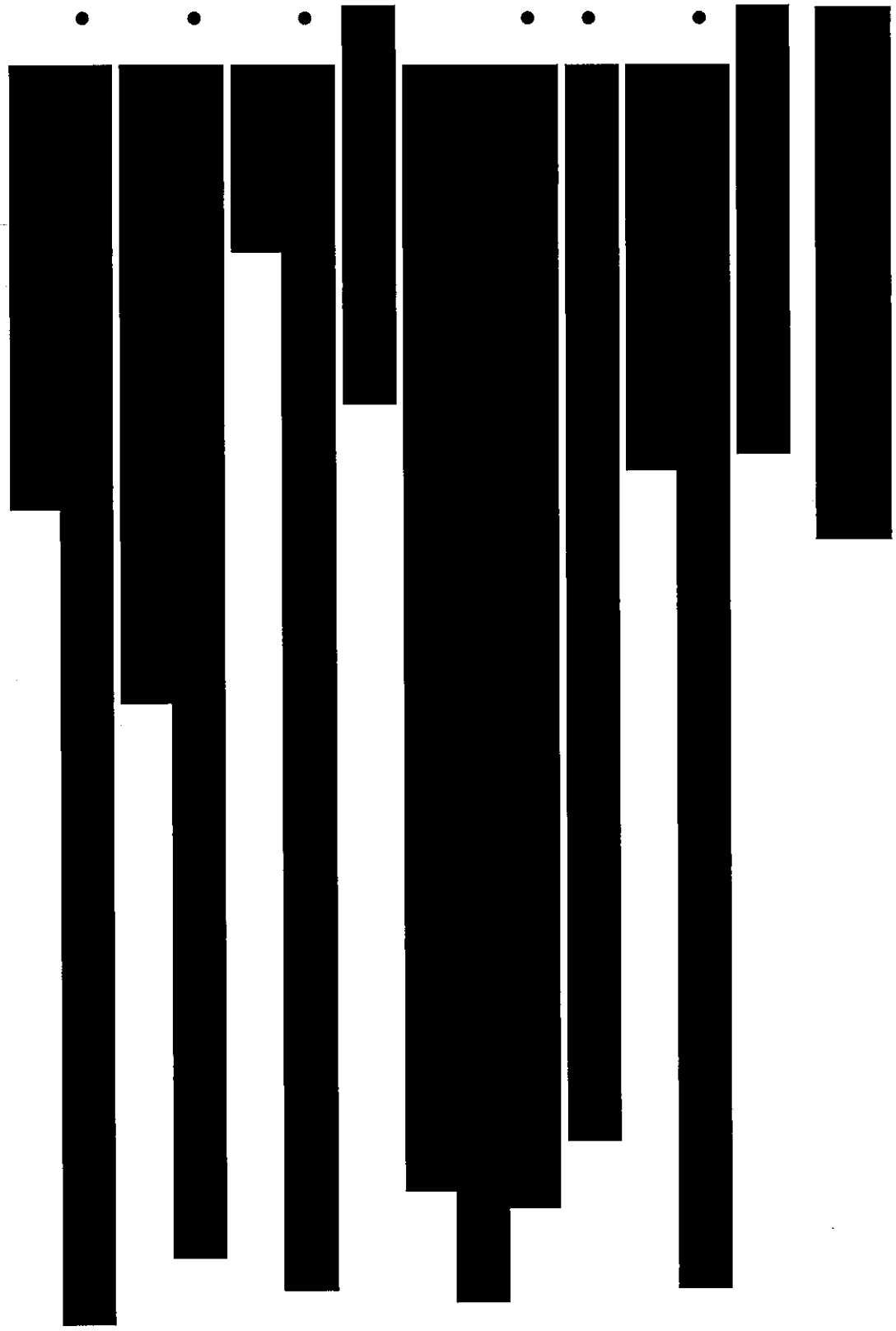
The power of natural thinking











WHOLESALE ENERGY SERVICES

PERFORMANCE REPORT	
REPORTING PERIOD:	JULY 2016
DIRECTOR:	[redacted]

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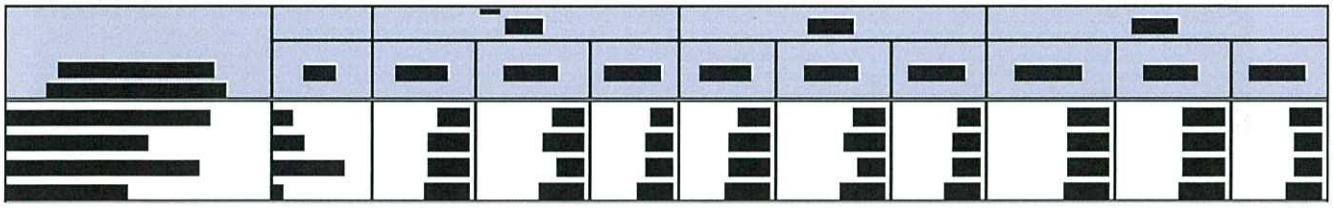

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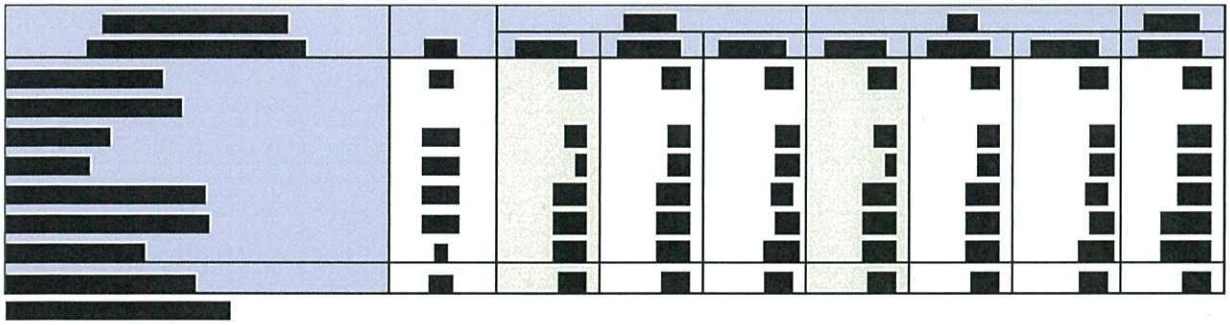

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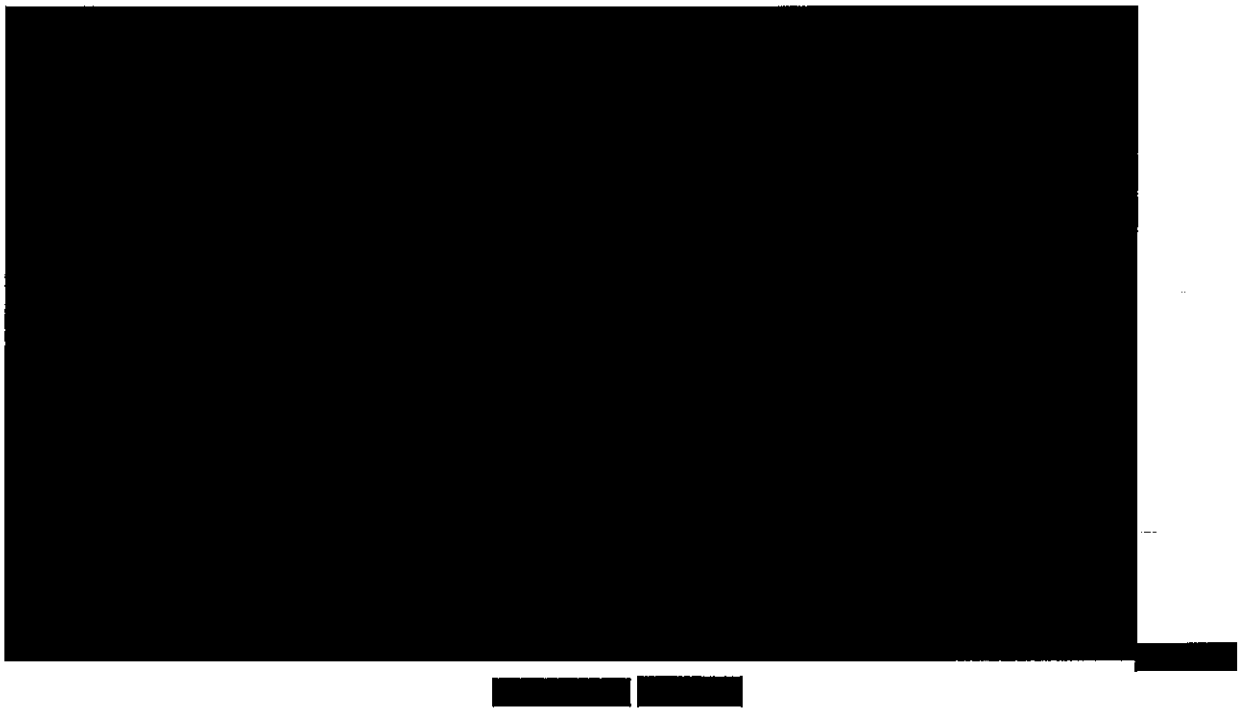

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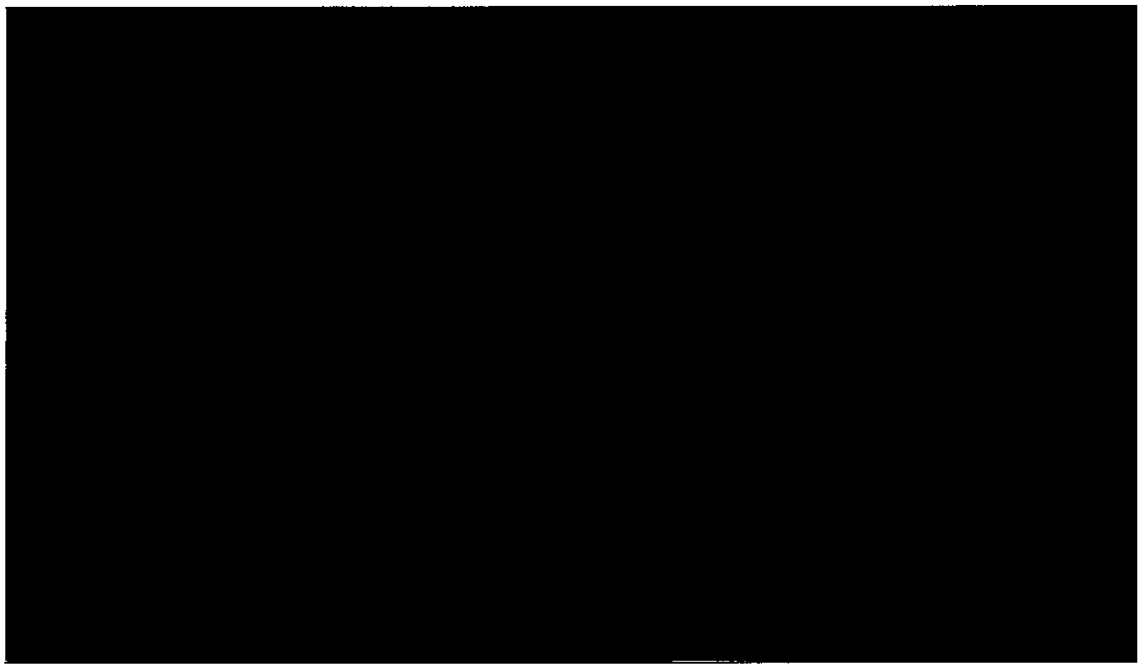

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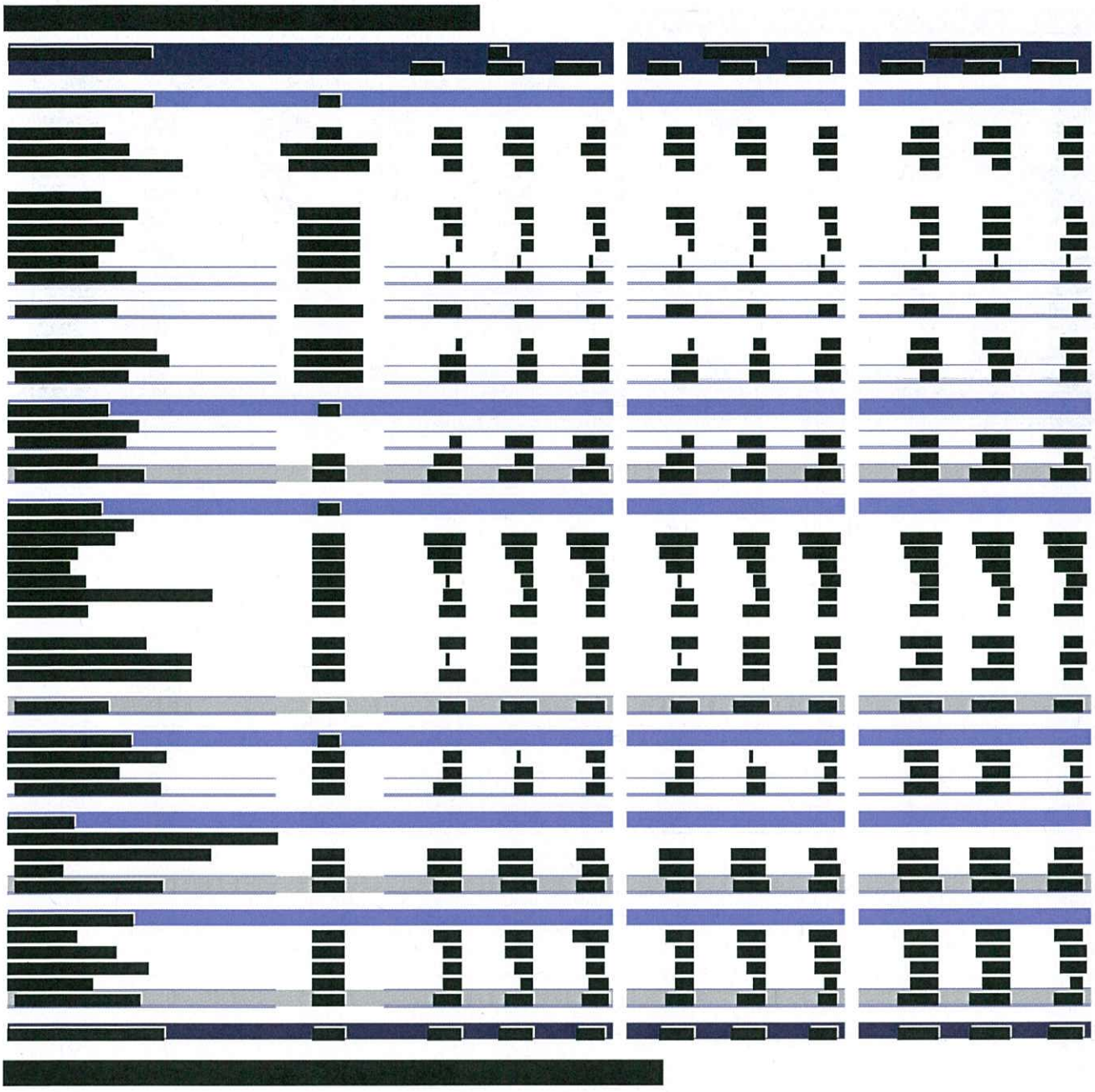
9. CLOUD SEEDING

A report on the cloud seeding flight on 5 June was provided to the state government and publically released on 29 July 2016.

Work has commenced on reviewing cloud seeding operations.



WHOLESALE ENERGY SERVICES

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