Lead Zinc Concentrator Complaint – Inspector Damian Lee

List of questions arising from complaint for meeting with RTI s78B(2) - Personal Information **14/1/12**

s73(2) - irrelevant

What spec chem. Suit is used by operators working around chemicals?

In plant need to check Impervious:- - line & MSDS. Tyhen F

Chemalert – is Trichloroethylene in Chemalert and what restrictions if any is ther on its use?

Chemalert –

s73(2) - irrelevant

Tyhen F

From: Lee Damian [Damian.Lee@dnrm.qld.gov.au]
Sent: Monday, 14 January 2013 9:35 AM
To: s73(2) - irrelevantxstratazinc.com.au'
Subject: Meeting re information from complaint

Hi s73(2) - irrelevant

Just confirming the time - was that 9:30 or 10 on Friday.

Cheers
Damian

Damian Lee
Inspector of Mines - Chemical
Mines Inspectorate
Department of Natural Resources and Mines
13 Isa St, Mount Isa Qld 4825
PO Box 334, Mount Isa 4825
t: +61 7 4747 2157
m Sch 4 - mobile phone
f: +61 7 4743 7165
e: damian.lee@dnrm.qld.gov.au

Department of Natural Resources and Mines
Mount Isa District Office
P.O. Box 334, MOUNT ISA QLD 4825
Phone: (07) 4747 2158, Fax: (07) 4743 7165

Mine/Quarry Name	File #	Operator	Activity Type	Region	Activity Date
Mt Isa - Lead & Zinc Concentrator	2893	Mount Isa Mines Ltd	Investigation	Northern	14/01/2013

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s59 of the Mining and Quarrying Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Today I attended site and met with management regarding information received in the form of a complaint. I met with s73(2) - irrelevant (General Manager), s73(2) - irrelevant (Operations Manager) and s73(2) - irrelevant (Maintenance Manager). I raised a number of issues listed below with any specific actions outlined. After this I inspected a number of items with in the plant with s73(2) - irrelevant

s73(2) - irrelevant

What specification of chemical suit is used by operators working around chemicals?

- Tychem F now in use for some time. Sighted suits available in control room. Had been specifically for cyanide and will be used with xanthates if suitable.

Is Trichloroethylene in Chemalert and what restrictions if any is there on its use?

- This is in Chemalert as class 6.1 toxic. No known restrictions and managers unaware of any specific use at this point in time.

From: Lee Damian [Damian.Lee@dnrm.qld.gov.au]
Sent: Tuesday, 29 January 2013 8:52 AM
To: s73(2) - irrelevant @xstratazinc.com.au'
Subject: Issues at #2

Hi s73(2) - irrelevant

Do you have an update on the issues from the MRE?

Thanks
Damian

Damian Lee
Inspector of Mines - Chemical
Mines Inspectorate
Department of Natural Resources and Mines
13 Isa St, Mount Isa Qld 4825
PO Box 334, Mount Isa 4825
t: +61 7 4747 2157
m s73(2) - irrelevant
f: +61 7 4743 7165
e: damian.lee@dnrm.qld.gov.au

From: s73(2) - irrelevant
Sent: Thursday, 31 January 2013 7:15 AM
To: Lee Damian; s73(2) - irrelevant

Subject: MRE Response
Attachments: [Untitled].pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning Damian
Please find attached responses to issues raised and discussed during a recent plant visit. If you have any queries please contact us at any time.
Regards

s73(2) - irrelevant

Safety and Health Superintendent, Zinc Lead Concentrator
Xstrata Zinc Mount Isa

Direct:
Fax: + s73(2) - irrelevant
Mobile

Email: s73(2) - irrelevant

MOUNT ISA
MINES

Tel +61 7 4744 3011
Fax +61 7 4744 3737
Web www.mountisamines.com.au

Address Mount Isa Mines Limited
Private Mail Bag 6
Mount Isa QLD 4825
Australia

30 January 2013

Department of Natural Resources and Mines
Northern Regional Office
PO Box 334
Mount Isa QLD 4825

FRM-111201 (Ver 5.0

Dear Mr Damian Lee

Please find information supplied regarding Mine Record Entry File 2893 at **Zinc Lead Concentrator** performed on 14/01/2013 in relation to information received in the form of a complaint.

BSafe Action Number	Action	Due Date
[Enter BSafe Action #]	[Select MRE Type]	/ /
As advised the following has to be addressed: Please see below		

Items and Response:

s73(2) - irrelevant

s73(2) - irrelevant

What specification of chemical suit is used by operators working around chemicals?

Response - Tychem F now in use for some time. Sighted suits available in control room. Had been specifically for cyanide and will be used with xanthates if suitable.

Is Trichloroethylene in Chemalert and what restrictions if any is there on its use?

Response - This is in Chemalert as class 6.1 toxic. No known restrictions and managers unaware of any specific use at this point in time.

s73(2) - irrelevant

From: s73(2) - irrelevant
Sent: Tuesday, 12 February 2013 11:53 AM
To: Lee Damian s73(2) - irrelevant
Subject: MRE Response

Good afternoon Damian

REF MRE 14/01/2013 line item "What hygiene monitoring is conducted for xanthates and CS2 in the concentrator?"

s73(2) - irrelevant

We found an anomaly with the Chemalert system which Gama is also working to rectify. There is a difference between what the manufacturer's MSDS for Xanthate states in terms of PPE clothing requirements, and what another tab entitled "Health" states. We have followed the higher standard and are working with Coogee Chemicals to identify the best type of clothing for our situation.

Thanks and regards

s73(2) - irrelevant

Safety and Health Superintendent, Zinc Lead Concentrator
Xstrata Zinc Mount Isa

Direct
Fax:
Mobil s73(2) - irrelevant

Email:

From s73(2) - irrelevant
Sent: Tuesday, 12 February 2013 4:39 PM
To: Lee Damian; s73(2) - irrelevant
CC: s73(2) - irrelevant
Subject: RE: MRE Response
Attachments: RE: MSDS Chemalert

Hi All,

The anomaly with the Chemalert System was raised with RMT and that was sorted.

Find attached the email correspondence from their Chief Scientific Officer.

Kind regards,

s73(2) - irrelevant I *Occupational Hygienist* I *Sustainable Development Department* I *Xstrata Copper*
s73(2) - irrelevant
I *Mount Isa Mines PMB 6 Admin Bldg Mount Isa 4825, QLD*
I *email:* s73(2) - irrelevant *I website:* www.xstrata.com

From s73(2) - irrelevant Mount Isa - Zinc)
Sent: Tuesday, 12 February 2013 11:53 AM
To: damian.lee@dnrm.qld.gov.au; s73(2) - irrelevant
Subject: MRE Response

Good afternoon Damian

REF MRE 14/01/2013 line item "What hygiene monitoring is conducted for xanthates and CS2 in the concentrator?"

s73(2) - irrelevant

We found an anomaly with the Chemalert system which Gama is also working to rectify. There is a difference between what the manufacturer's MSDS for Xanthate states in terms of PPE clothing requirements, and what another tab entitled "Health" states. We have followed the higher standard and are working with Coogee Chemicals to identify the best type of clothing for our situation.

Thanks and regards

s73(2) - irrelevant

Safety and Health Superintendent, Zinc Lead Concentrator
Xstrata Zinc Mount Isa

Direct
Fax:
Mobil s73(2) - irrelevant

Email:

****

The information contained in this e-mail is confidential and is

intended only for use of the addressee(s).

If you receive this e-mail in error, any use, distribution, or

copying of this e-mail is not permitted. You are requested to

forward unwanted e-mail and address any problems to the

Xstrata ICT Service Desk.

s73(2) - irrelevant

****

MILTON Kerrie

From: s73(2) - irrelevant
Sent: Tuesday, 12 February 2013 2:28 PM
To: s73(2) - irrelevant
Cc: s73(2) - irrelevant
Subject: RE: MSDS Chemalert
Attachments: Import File.PDX

Hi s73(2) - irrelevant

I hope you are well.

I have reviewed the issue and updated your database with the correction.

You may wish to check to confirm.

I have included a v3.3 import file in case my update did not incorporate Xstrata Zinc's database.

Kind regards,

s73(2) - irrelevant

Risk Management Technologies | Chief Scientific Officer | Tel: s73(2) - irrelevant Fax: | Mob | www.rmt.com.au

We value your feedback, please click here to send us any comments you may have.

From: s73(2) - irrelevant
Sent: Tuesday, 12 February 2013 2:37 PM
To: s73(2) - irrelevant

Cc: s73(2) - irrelevant
Subject: FW: MSDS Chemalert

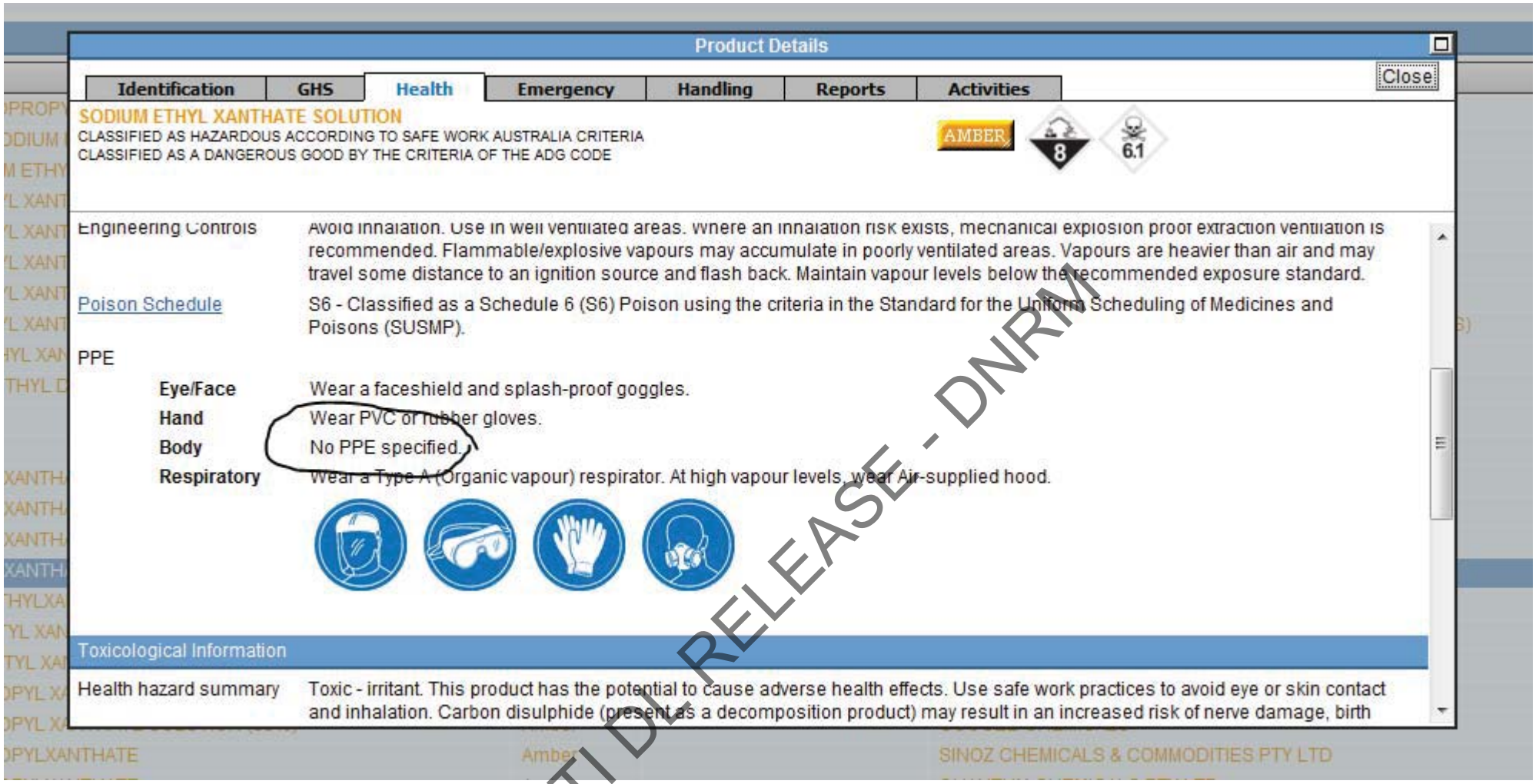
Hi CA Support,

Can someone investigate this and let me know?

SDS for Sodium Ethyl Xanthate Solution manufactured by Coogee Chemicals.

Issue:

Chemalert report says under PPE, body. No PPE specified (highlighted below).



In Coogee SDS which is also in Chemalert, under PPE, its says Wear cotton coveralls (highlighted below).

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

CARBON DISULPHIDE (EVOLVED)

ES-TWA: 10 ppm (31 mg/m3)

WES-TWA: 10 ppm (31 mg/m3)

SODIUM ETHYL XANTHATE

ES-TWA: 10ppm (Carbon disulphide)

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended. Flammable/explosive vapours may accumulate in poorly ventilated areas. Vapours are heavier than air and may travel some distance to an ignition source and flash back. Maintain vapour levels below the recommended exposure standard.

PPE Wear splash-proof goggles, rubber or PVC gloves, a faceshield and a Type A (Organic vapour) respirator. Wear cotton coveralls. At high vapour levels, wear: air-supplied hood.

This information is not consistent. Obviously, the Manufacturer SDS should be followed but our employees would go straight into Chemalert and read this information as well.

Can Chemalert fix this information to make it consistent with the manufacture information and let me know as soon as this is rectified?

Kind regards,

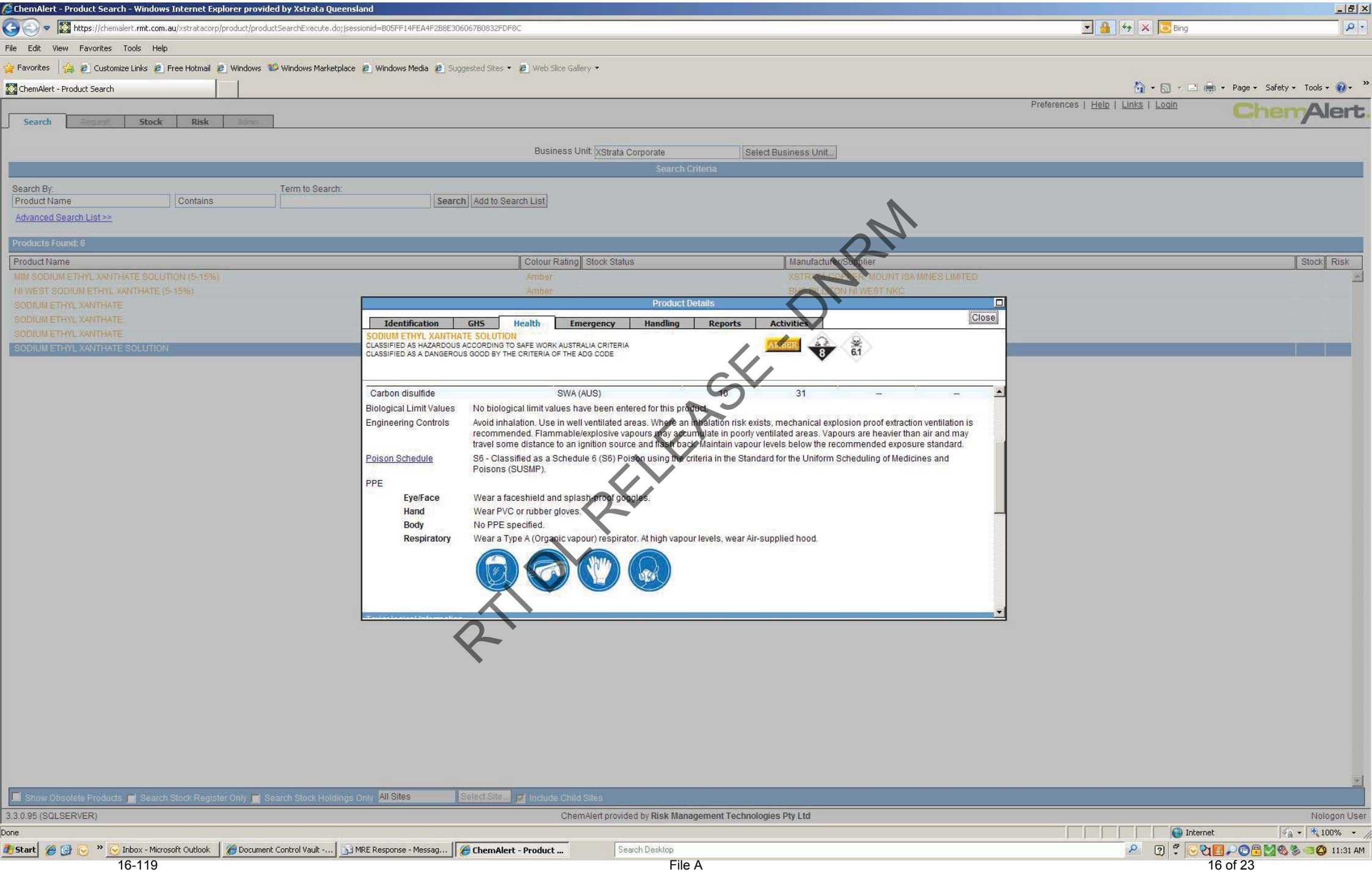
s73(2) - irrelevant

s73(2) - irrelevant I *Occupational Hygienist* I *Sustainable Development Department* I *Xstrata Copper*

s73(2) - irrelevant
I *Mount Isa Mines PMB 6 Admin Bldg Mount Isa 4825, QLD*
I *email:* s73(2) - irrelevant *I website:* www.xstrata.com

From: s73(2) - irrelevant
Sent: Tuesday, 12 February 2013 11:37 AM
To: s73(2) - irrelevant
Subject: MSDS Chemalert

Hi s73(2) - irrelevant
Just thought I would send this as a sample of our conversation Friday re the difference between the MSDS and the "Health" tab in Chemalert – please see the PPE note for Body below.
Regards
s73(2) - irrelevant



s73(2) - irrelevant
Safety and Health Superintendent, Zinc Lead Concentrator
Xstrata Zinc Mount Isa

Direc
Fax:
Mobil s73(2) - irrelevant

Email

****

s73(2) - irrelevant

****

62

s73(2) - irrelevant

63

s73(2) - irrelevant

14/11/13 NOTES FROM SITE MEETING XSTRATA ZINC, LOADZINC CONCENTRATOR RE COMPLAINT.

YPM - s78B(2) (GM)

s78B(2) (Maintenance Manager)

s78B(2) (Operations Manager)

Spoke about a complaint

we had received but
could not reveal source.
Some information may be
old but enough specifics
After meeting s78B(2)
accompanied me on inspection
of plant.

s73(2) - irrelevant

s73(2) - irrelevant

- Chem suit specification for
Xanthate + Cyanide. Now use
Tychem F - Sighted 3 suits
available in Control Room.
- Trichloroethylene - approved in
ChemAlert + Toxic. Not aware
of recent use.

s73(2) - irrelevant

Xanthates in mining

Mines safety bulletin no. 132 | 27 March 2013 | Version 1

Xanthates are a group of chemicals typically used in sulphide flotation in mining applications.

Common xanthate products are sodium ethyl xanthate (SEX), sodium isopropyl xanthate (SIPX), sodium isobutyl xanthate (SIBX) and potassium amyl xanthate (PAX).

Where is the risk?

Xanthates are classified as liable to spontaneous combustion in the Australian Dangerous Goods (ADG) Code. They pose a number of hazards due to their nature, the vast quantities used in industry and the climate conditions at most Queensland mines using them.

Hazards from xanthates include but are not limited to:

- production of toxic/flammable decomposition products (carbon disulphide (see below) and potentially, alcohol vapours)
- spontaneous combustion that creates toxic combustion products (sulphur dioxide, carbon monoxide and carbon dioxide)
- low order explosions from ignition of decomposition products
- acute harm if ingested or absorbed in significant amounts through skin
- acute irritation if inhaled or absorbed through skin.

In addition, animal studies indicate xanthates are linked to chronic damage to the liver and neurological system after long-term elevated exposure. (see the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) Sodium ethyl xanthate assessment report, May 1995, for further information)

Their stability is affected by:

- long storage periods at high temperature
- moisture content (in the manufactured product and moisture absorbed during storage)
- length of storage and
- the pH of any mixtures.

Xanthates are hygroscopic so readily absorb moisture from the air which, at high enough levels, can accelerate decomposition (NICNAS Sodium ethyl xanthate, May 1995).

Carbon disulphide

When xanthates decompose, they produce carbon disulphide (CS_2). This is a flammable gas with explosive limits from 1% to 50% by volume in air, and an autoigniton temperature of 90°C. (see the ILO ICSC card list 22 Carbon Disulphide)

The Time Weighted Average exposure is 10ppm (see the Safe Work Australia Hazardous Substances Information System) with an Immediately Dangerous to Life and Health value of 500ppm (see the CDC-NIOSH website). Anecdotal

evidence suggests readings of up to 200ppm CS2 were measured when simply opening boxes of xanthate.

Considerable literature exists on the effects of CS_2 with studies conducted in various countries. Identified health effects (NICNAS Sodium Ethyl Xanthate, May 1995) include:

- irritation to eyes, skin and respiratory tract
- acute poisoning effects including tremor, prostration, dyspnea, cyanosis and vascular collapse
- psychosis or narcosis may result from acute levels of up 500-1000ppm

Long-term exposure at high levels are responsible for:

- nervous system effects including symptoms of fatigue, insomnia, headaches and irritability
- increased susceptibility to heart disease including heart attack, high blood pressure and angina
- links to eye damage, reproductive effects and hearing loss.

Incidents and outcomes

In Queensland, xanthates are one of the most used mining reagents, by volume; they have been involved in many chemical incidents in recent years, including:

- Boxes of xanthate spontaneously combusting in storage areas
- Xanthate breaking down and leaking out of their boxes
- Fire in the air space of a xanthate storage tank ignited by welding sparks
- Accidental mixing of xanthate with sodium metabisulphite (SMBS) created a flammable atmosphere that was ignited by a spark from a tool on steel
- Solid xanthate rapidly decomposing when added to water, creating a large toxic plume
- A vacuum pump motor caught fire and caused a low order explosion in an industrial vacuum truck cleaning up xanthate waste from a sump.

Consequences

Safety and health consequences of these incidents included inhalation symptoms (nausea and vomiting), dizziness, burns, the evacuation of surrounding areas, and an explosion that ejected material up to 30m.

Potential consequences could have included serious inhalation symptoms, on-going health concerns and possible fatality.

Causes

Incident investigations have highlighted common causes, including some previously identified in readily available literature (e.g the NICNAS report). Some of the common causes include:

- **Moisture**. Boxes of solid xanthate accumulated moisture when left open for long periods or in humid conditions, leading to spontaneous combustion. Also, shortening of the drying process during manufacture led to xanthate with a high moisture content being supplied.
- **High temperature**. Xanthate was stored in high ambient temperatures for long periods which led to increased decomposition.
- **Length of storage**. Stock was not rotated properly, allowing old stock to 'age' for long periods.
- **Inappropriate mixing**. No labelling on the inside bag of boxed xanthate led to confusion over the contents which were then inadvertently added to SMBS. (This labelling is required by the ADG code and has been communicated to known

- suppliers in Queensland.)

  Poor training and procedures. The hazards of xanthates and their waste products were not identified by workers when inadequate procedures and training on chemicals and associated hazards left them unaware of the hazards or
- how to maintain risk at an acceptable level.

Controls for hazards

Follow the hierarchy of controls so risk is as low as reasonably achievable and at an acceptable level. When elimination or substitution of xanthates with less hazardous reagents isn't feasible due to the metallurgy of the ore, consider the following control recommendations when designing for hazards created by xanthates -

Substitution

Where feasible substitute liquid for solid xanthate to eliminate mixing steps in the process.

Engineering

- Store xanthate boxes to allow sufficient ventilation to disperse any fumes and ensure storage areas prevent build up of humidity.
- Use extraction hoods with scrubbers to eliminate xanthate dust from mixing.
- Remove people from involvement in the mixing process by using cranes and other equipment.
- Ensure electrical equipment in xanthate mixing, storage areas and clean up equipment complies with AS/NZS 2381 Electrical equipment for explosive atmospheres-Selection, installation and maintenance.
- Ensure vehicles used for cleanup of dangerous goods wastes meet the requirements of the ADG Code. (Section 6.9 might require advice on dangerous goods, in Queensland, from the Department of Transport and Main Roads.)
- Install cooling jackets on any liquid xanthate storage tanks.

As xanthate fumes and liquids are flammable, AS 1940 The storage and handling of flammable and combustible liquids could assist in identifying possible controls

Administration

Ensure storage, handling and mixing procedures include these activities:

- Train workers (including relevant contractors) to identify hazards associated with xanthates, including xanthate waste.
- Rotate stock properly (old stock used first) and keep minimal stock at the mine.
- Prepare xanthate bulky bags only immediately before use.
- Monitor CS_2 levels in areas known to have high occupational exposure levels.
- Clean equipment properly after mixing and use.
- Label all inner bags from boxed xanthate as required under the ADG code.

Personal protective equipment

Include appropriate respirator or fresh air supply mask, eye protection including goggles, and protective clothing including appropriately rated coveralls, gloves and boots where necessary.

Authorised by Phil Goode - A/Chief Inspector of Mines Contact: minesafetyandhealth@dnrm.qld.gov.au
Issued by the Queensland Department of Natural Resources and Mines

Placement: Place this announcement on noticeboards and ensure all relevant people in your organisation receive a copy.