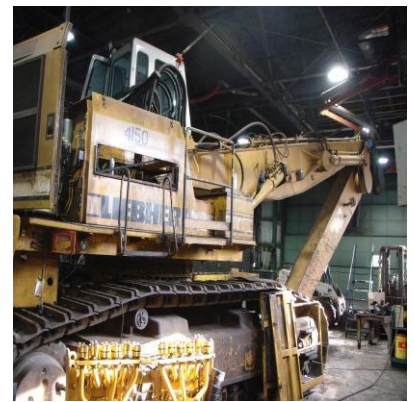
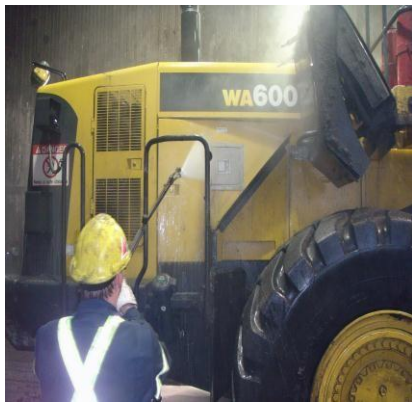


# Case Study – Innu-Science and Rio Tinto

Cleaning Earthmoving  
Equipment the Green Way



**RioTinto**



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# RioTinto

## Rio Tino Representatives:

**Daniel Blaize**

Plant Garage Supervisor

**Patrick Martineau**

Garage Foreman

**Christian Ménard**

President

**Robert Côté**

Head of SST & CSN

**Mario Tellier**

Manager of SST garage and CSN

**Paul Sasseville**

Distributor – Prodec Sorel



## Innu-Science Representatives:

**Mario Laorte – Director of Development**

Department of Applied Science Projects

Innu-Science Montreal Canada

**Yoland Denis – Vice President Business Development**

[yoland.denis@innu-science.com](mailto:yoland.denis@innu-science.com)

## Project Supervisor and Research and Development

**Steve Teasdale – Vice President of Scientific Affairs**

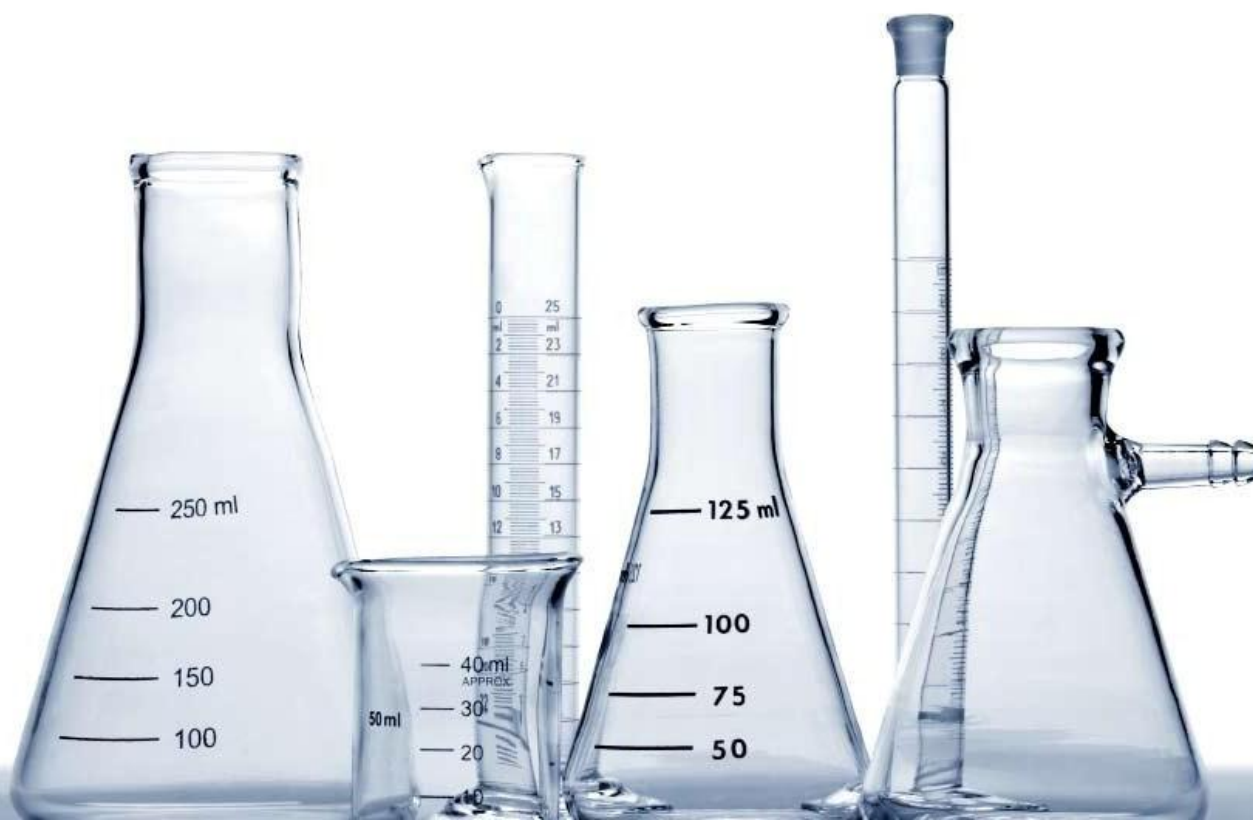
[steve.teasdale@innu-science.com](mailto:steve.teasdale@innu-science.com)

**Yves Hurtubise – PH.d – Director of Scientific Affairs**

[yves.hurtubise@innu-science.com](mailto:yves.hurtubise@innu-science.com)

**Étienne Dubé – PH.d - Research Centre Technology Park of Trois-Rivières**

[etienne.dube@innu-science.com](mailto:etienne.dube@innu-science.com)



# Project Objectives

- Conduct a field trial working with the Customer's Operational Staff, testing the product under normal operating conditions.
- Collaborate with the Rio Tinto Sustainability Development Task Force.
- Standardise and custom fit our methods, applications and products to dove-tail into the existing Rio Tinto's Standard Operating Procedures (SOP's).



# Applied Methodology

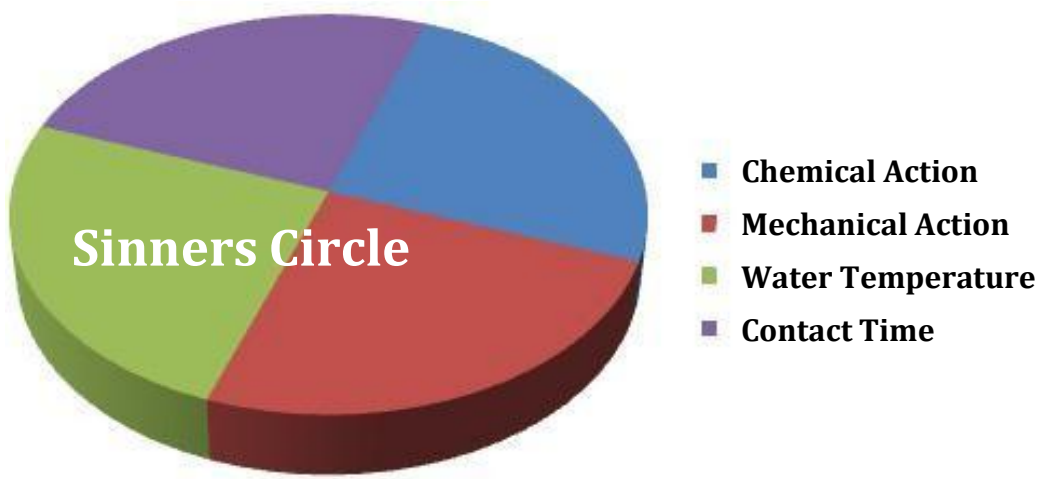
During the field trial period, we documented the various parameters that we had to consider to deliver an optimised solution whilst:

- meeting the user's expectations on cleaning performance.
- reducing the normal risks that impact on the health and safety of workers.

The optimised solution intelligence gained during the course of the project, will be used to improve our technology to ensure adherence to Sustainable Development practice for the benefit of Profit, People and Planet.



# Sinners Circle



The quality of good cleaning depends on 4 factors, which are listed below and is known as the “Sinners Circle”.

**Chemical action:** Is the action of a detergent or alkaline product. The method and the product to be used are dependent on the severity of soiling, the type of soil, as well as the type of surface to be cleaned.

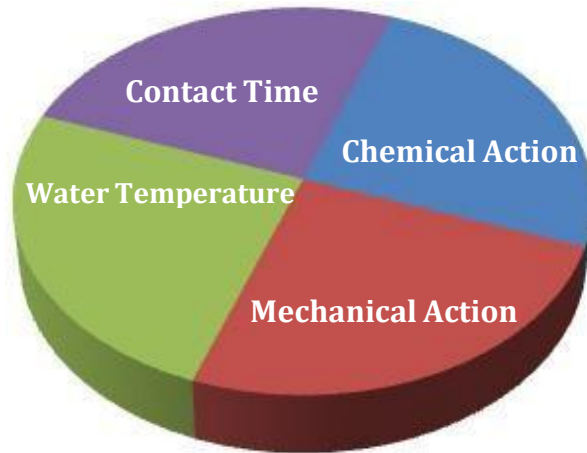
**Mechanical action:** Is to scrub or through the use of equipment such as a single disk rotary scrubber or an auto scrubber. Its main goal is to put the soil load into suspension and to remove it from the surface that is being cleaned. Therefore, it aids in the overall effectiveness of the detergent.

**Water temperature:** It plays an important part in the effectiveness of the cleaning product. Care must be taken in following the recommendations on water temperature as indicated by the manufacturer.

**Time of reaction or time of contact:** Is the time needed for the detergent to react with the soil load to remove it. In the case of disinfectants and sanitisers, this time is needed for the active ingredient to destroy micro-organisms.

# Cleaning Procedure for the use of

## NU-LIFE™



1

### Pre rinsing:

Remove excess dirt on the equipment with a pressure washer.



2

### Application:

Apply the degreasing solution to the equipment. Apply generously in heavily soiled areas. Apply the product with a Wilden type pump or low pressure foaming device.



3

### Contact time:

For an optimal result, allow the product to rest for about 10 minutes.



4

### Final Wash and Rinse:

Spray down with high pressure washer taking care to remove all debris. Heavily soiled areas might need more attention

Rinse with pressure washer, ensuring that all areas are cleaned to standard.





# Equipment #2171 ESSA1#001



# Record for Equipment #2171

|                    |  |                   |
|--------------------|--|-------------------|
| Equipment :        | 2171   |                   |
| Hours :            | 8h00 am  | 12h00 pm          |
| Technicians :      | Daniel Fournier  | Yvon Joyal        |
| Controllers :      | Daniel Blaize  | Patrick Martineau |
| SST Members :      | Mario Tellier  | Christian Ménard  |
| Dilutions :        | 1/20 30sec = 325 ml produit 1/3 de 20 L = 6500ml moyen pression  |                   |
| Water Temp:        | 28   |                   |
| Contact Time :     | 9h20 a 9h50  | 30 minutes        |
| Jet Angle :        | ok   | ok                |
| Odour :            | ok bien  | ok                |
| Nasal Irritation : | ok   | ok                |
| Eye Irritation :   | ok   | ok                |
| Skin Irritation :  | ok   | ok                |
| Results :          | ok   | ok                |
| Comments :         | Arrivée à 8h   |                   |
|                    | Explications: Daniel Blaze + Patrick Martineau + Christian Ménard + Daniel Fournier + Paul Sassevielle |                   |
|                    | À 10h, arrivé d'un nouvel employé: Yvon Joyal  |                   |
|                    | Même produit pas bon avec demo, ok   |                   |
|                    | * de Mario ont fait le travail   |                   |
|                    | * Gros test jeudi 12 mai 2011 à 6h am  |                   |
|                    |  |                   |
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|                    |  |                   |

BEFORE



DURING



AFTER



**AFTER**

**DURING**

**BEFORE**



**ESSSAI #002**

**DATE: 12 MAY 2011**

**AFTER**

**DURING**

**BEFORE**



**FSSSAI #002**

**DATE: 12 MAY 2011**

EQUIPMENT #2241ESSAI#002 12 MAY 2011



|                    |                                    |                   |
|--------------------|------------------------------------|-------------------|
| Equipment :        | 2341                               |                   |
| Hours :            | 09:00 am                           | 12:00 pm          |
| Technicians :      | Sylvain Duval                      |                   |
| Controllers :      | Daniel Blaize                      | Patrick Martineau |
| SST Members :      | Dave Lessard                       |                   |
| Dilutions :        | 475 ml 30 sec 1/2 20 L = 10 000 ml |                   |
| Water Teperature : | 28                                 |                   |
| Contact Time :     | 30 minutes                         | 15 minutes        |
| Jet Angle :        | ok                                 |                   |
| Odour :            | ok                                 |                   |
| Nasal Irritation : | ok                                 |                   |
| Eye Irritation :   | ok                                 |                   |
| Skin Irritation :  | ok                                 |                   |
| Results :          | Very Convincing                    |                   |
| Comments :         | Oil floated on water               |                   |
|                    |                                    |                   |
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**AFTER**

**DURING**

**BEFORE**



**ESSAI #002**



**AFTER**

**DURING**

**BEFORE**



ESSAI #002

DATE: 12 MAY 2011

17:

ASSESSMENT REPORT – NU-LIFE™ Department of Applied Research May 2011

**AFTER**

**DURING**

**BEFORE**



**ESSAI #002**

**DATE: 12 MAY 2011**

**AFTER**

**DURING**

**BEFORE**



**ESSAI #002**

**DATE: 12 MAY 2011**

# THE GOOD CHOICE – IMPACTING ON YOUR HEALTH



**CITRIKLEEN**



**NU-LIFE™**

**Strong odour**

**Low odour**

**Between 30 to 45% VOCs**

**Less than 1% VOCs**

**Suspected Carcinogen**

**No**

**Flash point: 52 °C**

**None**

**Liquid fuel (B3)**

**No**

**Can cause vomiting & headaches**

**No**

**Solvent easily absorbed by the skin (butyle)**

**No**

**Skin and eye sensitiser**

**Skin and eye sensitiser**

**Corrosive liquid (E)**

**No**

**Subject at a limit value of exposure**

**None**



# THE GOOD CHOICE – IMPACTING ON YOUR ENVIRONMENT



## CITRIKLEEN

**Contributor to urban smog formation**

**Non biodegradable under anaerobic conditions**

**By-product of hydrolyses can be dangerous**

**Sequestrant non biodegradable (EDTA)**

**Can bioaccumulate in aquatic organisms**



## NU-LIFE™

**No**

**Biodegradable under anaerobic and aerobic**

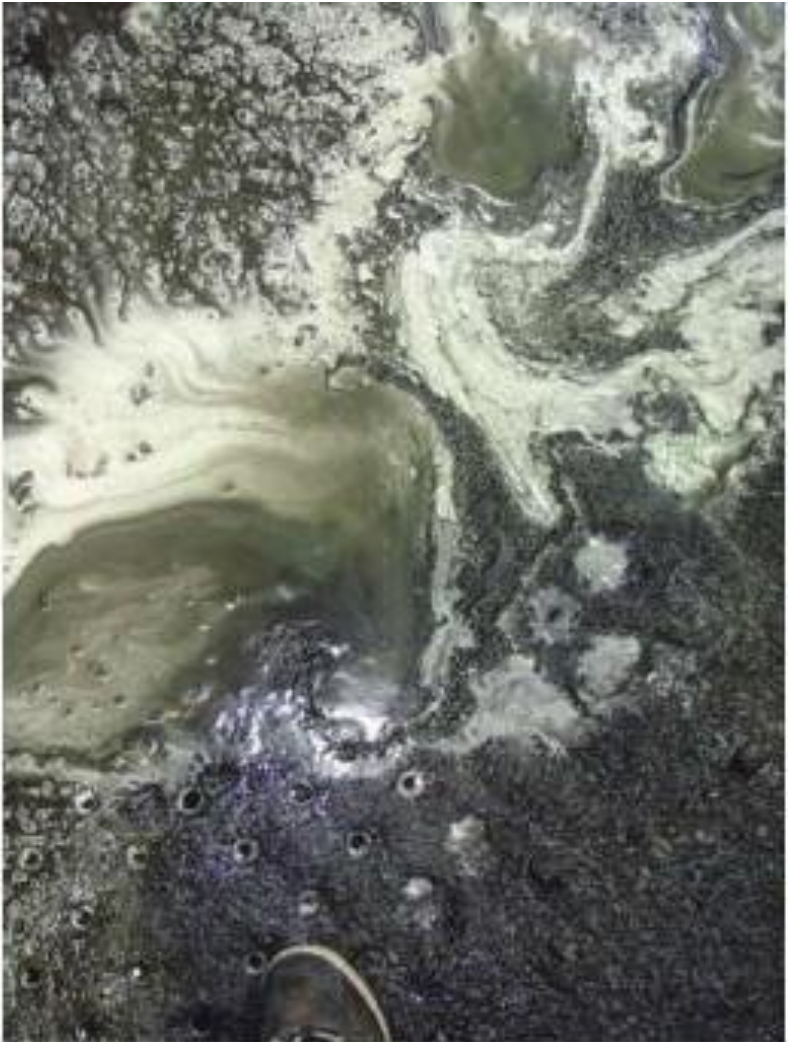
**Sequestrant easily biodegradable and ecological**

**No**

**No**



# Suspension of Fats, Oils and Greases



# Recommendations



## 1<sup>st</sup> RECOMMENDATION

**Always do a pre-rinse**



## 2<sup>nd</sup> RECOMMENDATION

**Increase water temperature to 32°C**



## 3<sup>rd</sup> RECOMMENDATION

**Increasing the pressure of the washing to a 2000 lbs. (138 Bar) machine**

# Creators of new technologies for occupational hygiene



[www.innu-science.com](http://www.innu-science.com)

## Innu-Science Subsidiaries

Canada – Germany - United Kingdom – France – Scandinavia -  
South Africa - Barbados

For SOUTH AFRICA

Contact [philclassic@lantic.net](mailto:philclassic@lantic.net) / Mobile +27(0) 81 431 2625