



Queensland Government

Office of the Minister for Sustainability, Climate Change and Innovation

Ref: BNE1767-31  
BNE2008/8130  
SU/08/2729

B/C Senior Policy Advisor to the Honourable Stephen Robertson MP  
Minister for Health  
GPO Box 48  
BRISBANE QLD 4001

- 4 JUL 2008

**COPY**

Ms Jackie Cooper  
President  
Stradbroke Island Management Organisation  
ume@

Referred by direction of the Honourable Andrew McNamara MP, for reply direct. Copy of the inwards correspondence is attached.

*David Shankey*  
David Shankey  
Senior Policy Advisor

Dear Ms Cooper

Thank you for your e-mail of 12 June 2008 concerning the transportation of monazite, and the protocols for storing and transporting radioactive materials. The Minister has asked me to respond on his behalf.

The Minister has noted your concerns. However, the management of radioactive materials falls within the jurisdiction of the Minister for Health. Accordingly, I have forwarded a copy of your e-mail to him for his consideration and reply direct to you.

If you have any further enquiries regarding this matter, please contact the office of the Honourable Stephen Robertson MP, Minister for Health, direct on telephone 3234 1191.

Yours sincerely

**SIGNED**

David Shankey  
Senior Policy Advisor  
MINMP

M1156035

Received in ESU: 10/7/08

OFFICER: GMSAHS (PHS)

Prepare Reply  Minister's signature

CONSENT  Standard Response

Option No.

Redirect to

File Note  CH Action Direct

Information only

Date: 28/7/08

DATE A on OHEPS

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08 JUL 2008

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To Dept for  
 BRIEF  
 REPLY  
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 INFORMATION

8...7...08

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Queensland 4002 Australia  
Telephone +61 7 3336 8032  
Facsimile +61 7 3227 6309  
Email sustainability@ministerial.qld.gov.au  
ABN 65 959 415 158

**Jayde Tennant**

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From: Jackie Cooper [ume@  
 Sent: Thursday, 12 June 2008 9:57 PM  
 To: Ministerial Office  
 Cc: #SIMO; #Paul Vekselstein; #Phil Weightman; #Cr Ogilvie  
 Subject: Concerns regarding Monazite transportation to NSI

Hon Andrew McNamara, Minister for Sustainability, Climate Change and Innovation

cc Phil Weightman, MP  
 Cr Craig Ogilvie, RCC

12.6.2008

Dear Mr McNamara

Monazite concentrate is being transported across Moreton Bay in unsigned, open vehicles that use the same public barges as other traffic to Stradbroke Island. Dust and spill from these trucks are typically observed. We wish to know the risk this radioactive material poses both to barge workers and drivers who habitually transport it and also to the general public during the course of the 50-minute crossing.

Is the radiation from monazite high or low? and how much monazite would constitute a hazard?

The monazite concentrate is returned to the island to be buried 10 metres below the ground in the reconstructed landform. Our island has a large groundwater aquifer: could burying concentrated monazite in the ground have a potential to pollute the groundwater?

Before monazite is extracted from mineral sand at Pinkenbah, the sand is stored ready for shipment off the island in an open stockpile next to the public barge and ferry wharves. The black ilmenite freely blows all over the car park and roadway, blanketing any vehicles parked for a day. A child care centre (and other public facilities including a library, police station, Dunwich Hall and football field) are close nearby. Is this black dust a hazard to public health?

Further, the trucks containing monazite drive through residential areas of Dunwich: what are the public health implications in terms of dust pollution and radiation risk?

What are the protocols for storing and transporting radioactive materials? Are these protocols being observed in the storage of mineral sand at Dunwich and other stockpiles on the island; the transportation of mineral sand by barge across to Pinkenbah; and the transportation of monazite concentrate on the public vehicle barges from Cleveland to Dunwich?

These are matters of considerable concern to the community.

Yours sincerely

Jackie Cooper

--  
 President  
 Stradbroke Island Management Organisation





**Hon Stephen Robertson MP**  
Member for Stretton



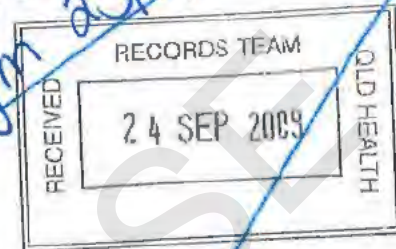
**Queensland  
Government**

Minister for Health

MI156035  
MO: H/08/05880

Ms Jackie Cooper  
President  
Stradbroke Island Management Organisation  
Email: ume@[REDACTED]

*refer  
MI156168  
(sign 23/9)*



Dear Ms Cooper

Thank you for your email dated 12 June 2008, regarding transport of mineral sands to and from North Stradbroke Island, forwarded to me by the Honourable Andrew McNamara, Minister for Sustainability, Climate Change and Innovation, for response.

Monazite, which you referred to in your email, is a small component of the mineral sands mined on North Stradbroke Island and of the material that is returned to the Island after processing. The mineral monazite can have a range of compositions and, in this case, the monazite contains a small amount of the radioactive element thorium.

I am advised that the mineral sands mined on Stradbroke Island are separated into two streams, a "rutile-zircon stream" that contains 0.3% monazite by weight, and an "ilmenite stream" containing 0.1% monazite by weight. The rutile-zircon stream, which contains the higher concentration of monazite, is contained in bins prior to being barged from the Island. The ilmenite stream, which has a much lower concentration of monazite, is stored in an open stockpile prior to its transport from the Island. The mineral sand is processed at Pinkenba by physical separation of its components. No chemical changes to any minerals are effected during the process.

As a part of the physical separation process at Pinkenba, the material which is to be returned to North Stradbroke Island is separated into different streams. Of the 45,000 tonnes per annum of material returned to North Stradbroke Island every year following the physical separation process, 5,700 tonnes is "zircon mags" which contains of the order of 10% monazite. This equates to approximately one truck of zircon mags being returned to the Island each day. It is this material which contains the elevated levels of radioactivity and, as a consequence, it is required to be transported in appropriately placarded, covered trucks with sealed tailgates. On arrival at the Island, the zircon mags are then returned to the mining lease and covered with 10 metres of clean material.

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Telephone +61 7 3234 1191  
Facsimile +61 7 3229 4731  
Email health@ministerial.qld.gov.au  
Website www.health.qld.gov.au

As you may be aware, the mining industry operates in a strictly regulated environment under the *Mineral Resources Act 1989* and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation and, as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. The radiological aspects of these arrangements were prepared in liaison with officers from my Department.

The activities which occur off the mining lease are also strictly regulated. In particular, persons transporting the "zircon mags" are required to be licensed under the *Radiation Safety Act 1999* to do so and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the Australian Radiation Protection and Nuclear Safety Agency Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at the following address:  
[www.arpansa.gov.au/Publications/Codes/rps2.cfm](http://www.arpansa.gov.au/Publications/Codes/rps2.cfm).

I am not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health. The mineral sand being transported is known to be insoluble and an existing component of Stradbroke Island's natural environment, and so it should not pose any additional risk to the water supply.

However, regardless of this, and in the light of concerns you have raised in relation to the radioactivity associated with this material, I have asked Queensland Health to test the airborne dust and the material spilled from trucks for radioactivity and to ascertain whether the quality of the ground water is likely to be affected by the way the "zircon mags" are placed in the mining lease. The goal of this work will be to determine whether there are any unacceptable health risks due to the presence of radioactivity. As a part of this, Queensland Health will also carry out inspections to assess the way transport of the zircon mags is being conducted to ensure it is in compliance with legislated requirements. Additionally, I have also asked Queensland Health to provide an opinion on the extent of the non-radioactive hazard posed by the dust in the areas you have mentioned in your email.

If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents an unacceptable health risk, Queensland Health will take steps to ensure that practices are rectified.

Should you have any queries regarding my advice to you, Mr Simon Critchley, Director, Radiation Health, Environmental Health Unit, Queensland Health, will be pleased to assist you and can be contacted on telephone (07) 3406 8006.

Yours sincerely

**STEPHEN ROBERTSON MP**

cc Mr Phil Weightman MP  
Member for Cleveland



M1156168

HO/08/05971

**Queensland Health  
MINISTERIAL BRIEFING NOTE FOR INFORMATION**

**TO: Minister Robertson**

**FROM: A/Senior Director, Environmental Health Unit**

**SUBJECT North Stradbroke Island mineral sands**

**PURPOSE**

To inform the Minister about matters associated with the mineral sand mining industry on North Stradbroke Island.

**RECOMMENDATION**

It is recommended that the Minister note the matters in this brief and provide the attached letter and extract from this brief to Phil Weightman MP, Member for Cleveland who is seeking this information.

**FUNDING SOURCE**

- N/A

**CURRENT ISSUES**

- Questions have been raised by concerned citizens and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the Island's sand mining activities.
- The operator of the Island's sand mine is currently seeking to vary the activities it performs on the Island and this is likely to have been a key issue resulting in the raised interest in this matter at this time.
- The Department is not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health.
- The local member, Phil Weightman MP, Member for Cleveland, is seeking a briefing from Queensland Health in relation to this matter as he is receiving many questions from concerned constituents.

**PROPOSED ACTIONS**

- Queensland Health will carry out a series of tests and inspections to determine the nature of the mineral sands and assess health impacts. Testing will include sampling of dust, sampling of material spilled from trucks, sampling of stockpiles, solubility tests and assessments of general dust levels in areas affected by the transport of materials as part of the sand mining operation.
- Queensland Health will carry out inspections to assess the way transport and storage of the zircon mags is conducted and will determine whether the transport of the mineral sand is in compliance with legislated requirements.
- If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents a health risk, Queensland Health will take steps to ensure that practices are rectified and are at acceptable levels of safety. Queensland Health will also continue to monitor the issue to ensure public safety.

30 JUL 2008

Advisor	<i>[Signature]</i> OK
Dated	14/8/08
Noted/	
Further information required	
Minister	<i>[Signature]</i>
Dated	27/8/08

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<input checked="" type="checkbox"/>	MINISTER
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Author's Name: Simon Critchley Position: Director Unit/District: Radiation Health, Environmental Health Unit Tel No: 3406 8006 Date: 25 July 2008	Cleared by: (DM/SD/SDIR) Name: Dr Linda Selvey Position: Senior Director Unit/District: Population Health Branch Tel No: 3234 1145 Date: 25 July 2008	Cleared by: (CHO) Name: Dr Jeannette Young Position: Chief Health Officer AHS: Division of the Chief Health Officer Tel No: 3234 1137 Date: 28 July 2008	DG <i>[Signature]</i> 31/7.
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## BACKGROUND

- Australia has extensive deposits of mineral sands which comprise: titanium minerals (rutile, ilmenite); zircon; and monazite. Most of Australia's mineral sands occur on the east coast of Australia between Sydney and Fraser Island and on the southern section of the coast of Western Australia, and have been mined since the 1930s.
- Zircon contains small amounts of the radioactive elements uranium and thorium, and monazite may also contain the radioactive element thorium. The monazite in the mineral sands mined on North Stradbroke Island does contain the radioactive element thorium and it is the monazite which is the predominant source of the radioactivity in the mineral sands extracted from this location.
- Questions have been raised by concerned citizens and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island. The questions seem to have been prompted by observations of dust and spillage of material from trucks travelling to North Stradbroke Island but might also have been prompted as a result of a recent proposal by the operator of the sand mining company to vary its mining related activities.
- A technical summary about the North Stradbroke Island mineral sand mining industry is attached.
- Within the bounds of the mining lease on North Stradbroke Island, activities are strictly regulated under the *Mineral Resources Act 1989* and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation and, as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. Although this part of the sand mining operation falls within the jurisdiction of the Department of Mines and Energy, the radiological aspects of these arrangements were prepared in liaison with officers from Queensland Health.
- The activities which occur off the mining lease are also strictly regulated, primarily by the *Workplace Health and Safety Act 1995*. However, during the separation of the components of the mineral sands, the material known as "zircon mags" is collected and, due to its elevated levels of radioactivity, this material is regulated under the *Radiation Safety Act 1999*.
- Approximately 13% of the total material transported back to the Island is classified as zircon mags. This equates to approximately one truck per day transporting this material back to the Island, and it is this transport that is subject to regulatory requirements under the *Radiation Safety Act 1999*.
- Persons transporting the "zircon mags" are required to be licensed under the *Radiation Safety Act 1999* to do so, and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at: [www.arpansa.gov.au/Publications/Codes/rps2.cfm](http://www.arpansa.gov.au/Publications/Codes/rps2.cfm).

## MEDIA IMPLICATIONS AND KEY MESSAGES

- Radiation is an emotive issue and the media and public may perceive a greater risk than is actually the case. It is important that consistent messages are presented to the media and the public and that correct language is used.

Author's Name: Simon Critchley Position: Director Unit/District: Radiation Health, Environmental Health Unit Tel No: 3406 8006 Date: 25 July 2008	Cleared by: (DM/SD/SDIR) Name: Dr Linda Selvey Position: Senior Director Unit/District: Population Health Branch Tel No: 3234 1145 Date: 25 July 2008	Cleared by: (CHO) Name: Dr Jeannette Young Position: Chief Health Officer AHS: Division of the Chief Health Officer Tel No: 3234 1137 Date: 28 July 2008	DG
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**ATTACHMENTS:**

- Attachment 1. North Stradbroke Island Mineral Sand Mining Industry – Technical Summary.
- Attachment 2. Letter to Phil Weightman MP – MI156168

**MINISTER'S COMMENTS**

*Minister  
 you may wish  
 to notify the  
 Minister for Mines  
 & Minister for Workplace  
 Health & Safety of the  
 proposed O&A activities.*

*DAJW  
 31/7*

*Agreed*

RTI RELEASED

<p>Author's Name: Simon Critchley                  Position: Director                  Unit/District: Radiation Health,                  Environmental Health Unit                  Tel No: 3406 8006                  Date: 25 July 2008</p>	<p>Cleared by: (DM/SD/SDIR)                  Name: Dr Linda Selvey                  Position: Senior Director                  Unit/District: Population Health Branch                  Tel No: 3234 1145                  Date: 25 July 2008</p>	<p>Cleared by: (CHO)                  Name: Dr Jeannette Young                  Position: Chief Health Officer                  AHS: Division of the Chief Health                  Officer                  Tel No: 3234 1137                  Date: 28 July 2008</p>	<p>DG</p>
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## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

1. The mineral sand being mined on North Stradbroke Island is separated, on the island, into two streams; a “rutile-zircon stream” (containing 0.3% monazite by weight) and an “ilmenite stream” (containing 0.1% monazite by weight).
2. In the previous year approximately 182,000 tonnes of sand in the “rutile-zircon stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand is temporarily stored at Dunwich in enclosed bins.
3. In the same year approximately 196,000 tonnes of sand in the “ilmenite stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand (with the lower concentration of monazite) is temporarily stored in an open stockpile.
4. Approximately 75,000 tonnes of silica sands from a silica sand company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland.
5. The mineral sand is processed at Pinkenba by physical separation of its components into a number of streams. Importantly, no chemical changes to any minerals are effected during the process. Of the 45,000 tonnes of material returned to North Stradbroke Island in the previous year:
  - 16,500 tonnes was “ilmenite reject” containing approximately 0.5% monazite by weight,
  - 12,700 tonnes was “zircon tails” containing approximately 1% monazite by weight,
  - 5,700 tonnes was “zircon mags” containing approximately 10% monazite by weight.
6. The level of radioactivity in the “zircon mags” is such that this material is regulated under the *Radiation Safety Act 1999*, hence this material is required to be transported back to the island in accordance with that Act. The ilmenite reject and the zircon tails are not classified as being radioactive due to their very low concentrations of radioactive elements. The zircon mags returned to the island is transported by covered trucks using the public ferry. Additionally, the trucks carrying the “zircon mags” have sealed tailgates and are required to be appropriately placarded. Approximately one truck load per day of “zircon mags” is returned to the island. A local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.
7. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material. The mineral sand being transported is known to be insoluble and an existing component of Stradbroke Island’s natural environment, and so it should not pose any additional risk to the water supply or to vegetation because the radioactive elements are not available because of the insolubility of the mineral.





**Hon Stephen Robertson MP**  
Member for Stretton



**Queensland  
Government**

Minister for Health

MI156168  
MO: H/08/05971

Mr Phillip Weightman MP  
Member for Cleveland  
PO Box 8144  
CLEVELAND QLD 4163

Dear Mr Weightman

I refer to the mineral sand mining industry on North Stradbroke Island, and wish to advise you about the action I have undertaken in response to the concerns citizens have raised, to ensure the mining operation is not presenting a public health risk.

I have asked Queensland Health to test the airborne dust and the material spilled from trucks for radioactivity and to ascertain whether the quality of the ground water is likely to be affected by the way the "zircon mags" are placed in the mining lease. The goal of this work will be to determine whether there are any unacceptable health risks due to the presence of radioactivity. As a part of this, Queensland Health will also carry out inspections to assess the way transport of the zircon mags is being conducted to ensure it is in compliance with legislated requirements.

Additionally, I have also asked Queensland Health to provide an opinion on the extent of the non-radioactive hazard posed by the dust in areas which have been identified by the citizens on the island as matters of concern.

For your information, I have attached further technical information about the current mining operations on the island.

Should you have any queries regarding my advice to you, Mr Ryan Robertson, Policy Advisor, will be pleased to assist you and can be contacted on telephone 3234 1191.

Yours sincerely

**STEPHEN ROBERTSON MP**

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147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia  
Telephone +61 7 3234 1191  
Facsimile +61 7 3229 4731  
Email [health@ministerial.qld.gov.au](mailto:health@ministerial.qld.gov.au)  
Website [www.health.qld.gov.au](http://www.health.qld.gov.au)

## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

1. The mineral sands mined on Stradbroke Island are separated into two streams: a “rutile-zircon stream” that contains 0.3% monazite by weight; and an “ilmenite stream” containing 0.1% monazite by weight. It is monazite, which is a small component of the mineral sands mined on North Stradbroke Island and of the material that is returned to the island after processing, that is of radiological interest.
2. The rutile-zircon stream which contains the higher concentration of monazite is contained in bins prior to being barged from the island. The ilmenite stream which has a much lower concentration of monazite is stored in an open stockpile prior to its transport from the island. The mineral sand is processed at Pinkenba by physical separation its components. No chemical changes to any minerals are effected during the process.
3. As a part of the physical separation process at Pinkenba, the material which is to be returned to North Stradbroke Island is separated into different streams. Of the 45,000 tonnes per annum of material returned to North Stradbroke Island every year following the physical separation process, 5,700 tonnes is “zircon mags” which contains of the order of 10% monazite. This equates to approximately 1 truck per day delivering zircon mags to the island. It is this material which contains the elevated levels of radioactivity and, as a consequence, it is required to be transported in appropriately placarded, covered trucks with sealed tailgates. On arrival at the island, the zircon mags are then returned to the mining lease and covered with 10 metres of clean material.
4. The mineral sand being mined on North Stradbroke Island is separated, on the island, into two streams; a “rutile-zircon stream” (containing 0.3% monazite by weight) and an “ilmenite stream” (containing 0.1% monazite by weight).
5. In the previous year approximately 182,000 tonnes of sand in the “rutile-zircon stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand is temporarily stored at Dunwich in enclosed bins.
6. In the same year approximately 196,000 tonnes of sand in the “ilmenite stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand (with the lower concentration of monazite) is temporarily stored in an open stockpile.
7. Approximately 75,000 tonnes of silica sands from a silica sands company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland.
8. The mineral sand is processed at Pinkenba by physical separation of its components into a number of streams. Importantly, no chemical changes to any minerals are effected during the process. Of the 45,000 tonnes of material returned to North Stradbroke Island in the previous year:
  - 16,500 tonnes was “ilmenite reject” containing approximately 0.5% monazite by weight,
  - 12,700 tonnes was “zircon tails” containing approximately 1% monazite by weight,
  - 5,700 tonnes was “zircon mags” containing approximately 10% monazite by weight.
9. The level of radioactivity in the “zircon mags” is such that this material is regulated under the *Radiation Safety Act 1999*. Hence this material is required to be transported back to the island in accordance with that Act. The mineral sand returned to the island is transported by covered trucks using the public ferry. Additionally, the trucks carrying the “zircon mags” have sealed tailgates and are required to be appropriately placarded. Approximately one truck load per day of “zircon mags” is returned to the island. A local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.
10. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material. The mineral sand being transported is known to be insoluble and an existing component of Stradbroke Island’s natural environment, and so it should not pose any additional risk to the water supply or to vegetation because the radioactive elements are not available via this route.



KCS/004402



Hon Stephen Robertson MP  
Member for Stretton



Queensland  
Government

FILE AWAY

Minister for Health

MI156168

MO: H/08/05971

25 SEP 2008

Ms Jackie Cooper

Email: [ume@...](mailto:ume@...)



E-MAILED  
25/9/08

Dear Ms Cooper

Thank you for your email dated 12 June 2008, regarding transport of mineral sands to and from North Stradbroke Island, forwarded to me by the Honourable Andrew McNamara MP, Minister for Sustainability, Climate Change and Innovation, Member for Hervey Bay, for response. I apologise for the delay in responding.

Monazite, which you referred to in your email, is a small component of the mineral sands mined on North Stradbroke Island and of the material that is returned to the island after processing. The mineral monazite can have a range of compositions, and in this case, the monazite contains a small amount of the radioactive element thorium.

I am advised that the mineral sands mined on Stradbroke Island are separated into two streams, a "rutile-zircon stream" that contains 0.3% monazite by weight, and an "ilmenite stream" containing 0.1% monazite by weight. The rutile-zircon stream, which contains the higher concentration of monazite, is contained in bins prior to being barged from the Island. The ilmenite stream, which has a much lower concentration of monazite, is stored in an open stockpile prior to its transport from the island. The mineral sand is processed at Pinkenba by physical separation of its components. No chemical changes to any minerals are effected during the process.

As a part of the physical separation process at Pinkenba, the material which is to be returned to North Stradbroke Island is separated into different streams. Of the 34,000 tonnes of material returned to North Stradbroke Island during 2007 following the physical separation process, 6,000 tonnes was "zircon mags" which contains of the order of 10% monazite. This equates to approximately one truck of zircon mags being returned to the Island each day. It is this material which contains the elevated levels of radioactivity and, as a consequence, it is required to be transported in appropriately placarded, covered trucks with sealed tailgates. On arrival at the Island, the zircon mags are then returned to the mining lease and covered with 10 metres of clean material.

As you may be aware, the mining industry operates in a strictly regulated environment under the *Mineral Resources Act 1989* and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation, and as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. The radiological aspects of these arrangements were prepared in liaison with officers from my Department.

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147-163 Charlotte Street Brisbane  
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Telephone +61 7 3234 1191  
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Website [www.health.qld.gov.au](http://www.health.qld.gov.au)

FILE AWAY

The activities which occur off the mining lease are also strictly regulated. In particular, persons transporting the "zircon mags" are required to be licensed under the *Radiation Safety Act 1999* to do so and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the Australian Radiation Protection and Nuclear Safety Agency Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at [www.arpsa.gov.au/pubs/rps/rps2\\_2008.pdf](http://www.arpsa.gov.au/pubs/rps/rps2_2008.pdf).

I am not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health. The mineral sand being transported is known to be insoluble and an existing component of Stradbroke Island's natural environment, and so it should not pose any additional risk to the water supply.

However, regardless of this, and in the light of concerns you have raised in relation to the radioactivity associated with this material, I understand Queensland Health will test the airborne dust and the material spilled from trucks for radioactivity and ascertain whether the quality of the ground water is likely to be affected by the way the "zircon mags" are placed in the mining lease. The goal of this work will be to determine whether there are any unacceptable health risks due to the presence of radioactivity. As a part of this, Queensland Health will also carry out inspections to assess the way transport of the zircon mags is being conducted to ensure it is in compliance with legislated requirements. Additionally, I understand Queensland Health will also provide an opinion on the extent of the non-radioactive hazard posed by the dust in the areas you have mentioned in your email.

If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents an unacceptable health risk, Queensland Health will take steps to ensure that practices are rectified.

I am aware of the meeting that occurred between yourself, other members of the Stradbroke Island Management Organisation, Mr Phil Weightman MP, Member for Cleveland, and three officers of Queensland Health on 22 August 2008. I hope you found the meeting a positive one and are satisfied with the follow up actions that Queensland Health will be taking. My Office has been briefed on the outcomes of this meeting. I also hope that the meeting has opened a channel of communication to allow Queensland Health staff to clarify issues of concern and to clarify the roles played by different Government Departments on the Island.

I have written to the Honourable John Mickel MP, Minister for Transport, Trade, Employment and Industrial Relations and the Honourable Geoff Wilson MP, Minister for Mines and Energy, to notify them of this issue.

Should you have any queries regarding my advice to you, Mr Simon Critchley, Director, Radiation Health, Environmental Health Unit, Queensland Health, will be pleased to assist you and can be contacted on telephone 3406 8006.

Yours sincerely



**STEPHEN ROBERTSON MP**



RCOS/004402



Hon Stephen Robertson MP  
Member for Stretton



Queensland  
Government

Minister for Health

MI157446

Mr Phil Weightman MP  
Member for Cleveland  
PO Box 8144  
CLEVELAND QLD 4163

FILE AWAY

25 SEP 2008

Dear Mr Weightman

I refer to the mineral sand mining industry on North Stradbroke Island, and wish to advise you regarding the action I have undertaken in response to the concerns citizens have raised, to ensure the mining operation is not presenting a public health risk.

I understand Queensland Health will test the airborne dust and the material spilled from trucks for radioactivity and ascertain whether the quality of the ground water is likely to be affected by the way the "zircon mags" are placed in the mining lease. The goal of this work will be to determine whether there are any unacceptable health risks due to the presence of radioactivity. As part of this, Queensland Health will also carry out inspections to assess the way transport of the zircon mags is being conducted to ensure it is in compliance with legislated requirements.

Additionally, Queensland Health will provide an opinion on the extent of the non-radioactive hazard posed by the dust in areas which have been identified by the citizens on the Island as matters of concern.

For your information, I have attached further technical information about the current mining operations on the Island.

I am aware of the meeting that occurred between yourself, members of the Stradbroke Island Management Organisation, and three officers of Queensland Health on 22 August 2008. I hope you found the meeting a positive one and are satisfied with the follow up actions that Queensland Health will be taking. I understand my Policy Advisor, Ms Elise Staples, has sought feedback from both Departmental staff and yourself on the outcomes of this meeting. I also hope that the meeting has opened a channel of communication to allow Queensland Health staff to clarify issues of concern and to clarify the roles played by different Government Departments on the Island.

I have written to the Honourable John Mickel MP, Minister for Transport, Trade, Employment and Industrial Relations and the Honourable Geoff Wilson MP, Minister for Mines and Energy, to notify them of this issue.

19th Floor State Health Building  
147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia

Telephone +61 7 3234 1191  
Facsimile +61 7 3229 4731  
Email health@ministerial.qld.gov.au  
Website www.health.qld.gov.au



Should you have any queries regarding my advice to you, Ms Elise Staples, Policy Advisor, will be pleased to assist you and can be contacted on telephone 3234 1191.

Yours sincerely



**STEPHEN ROBERTSON MP**

RTI RELEASE



## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

Updated 12 September 2008

### *Activities on North Stradbroke Island*

1. Most sand consists of grains of the mineral quartz (SiO<sub>2</sub>). Mineral sands are old sands that contain concentrations of the minerals; rutile, ilmenite, zircon, and monazite.
  - Rutile and ilmenite are oxides containing the element titanium.
  - Zircon is a silicate containing the element zircon.
  - Monazite is a phosphate containing the elements cerium, lanthanum, neodymium, and thorium in various proportions.
2. In 2007, approximately 50,000,000 tonnes of sand was mined on North Stradbroke Island by Consolidated Rutile Pty Ltd. The desired minerals (Rutile, Zircon, Ilmenite) account for about 0.6% of the mass mined.
3. The mineral sand being mined on North Stradbroke Island is separated, on the island, into two streams; a “rutile-zircon stream” (containing 0.3% monazite by weight) and an “ilmenite stream” (containing 0.1% monazite by weight).
4. There are no chemicals used in the mining and processing of mineral sands. The separation on North Stradbroke Island is done by physical methods. No chemical changes to any minerals are effected during the process. Physical processes used at the North Stradbroke Island mine sites include screening, wet gravity and magnetic separation. The processes used are;
  - Screening, that relies on different particle sizes.
  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
5. In 2007 approximately 171,000 tonnes of sand in the “rutile-zircon stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand is temporarily stored at Dunwich in enclosed bins.
6. In the same year approximately 195,000 tonnes of sand in the “ilmenite stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand (with the lower concentration of monazite) is temporarily stored in an open stockpile.

### *Processing at Pinkenba*

7. The mineral sand is processed at Pinkenba by physical separation of its components into a number of streams. No chemical changes to any minerals are effected during the process.



8. There are no chemicals used in the processing of mineral sands. Separation techniques used in the concentration and processing of mineral sands rely solely on the physical characteristics of the different minerals. Physical processes used at the Pinkenba processing plant include screening, wet gravity, magnetic and electrostatic separations. The processes used are;
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  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
  - Electrostatic separation, that relies on the different surface conductivity of the minerals.
  
9. After processing by physical separation, the useful minerals (rutile, ilmenite and zircon) are packaged for sale. There are three streams of unwanted material:
  - “ilmenite reject” containing approximately 0.5% monazite by weight,
  - “zircon tails” containing approximately 1% monazite by weight,
  - “zircon mags” containing approximately 10% monazite by weight.

#### *Return of tailings to North Stradbroke Island*

10. Of the 34,000 tonnes of material returned to North Stradbroke Island in 2007:
  - 15,000 tonnes was “ilmenite reject”,
  - 13,000 tonnes was “zircon tails”,
  - 6,000 tonnes was “zircon mags”.
  
11. The level of radioactivity in the “zircon mags” is such that this material is regulated under the Radiation Safety Act 1999, hence this material is required to be transported back to the island in accordance with that Act. The ilmenite reject and the zircon tails are not classified as being radioactive due to their very low concentrations of radioactive elements. The “zircon mags” returned to the island is transported by covered trucks using the public ferry. Additionally, the trucks carrying the “zircon mags” have sealed tailgates and are required to be appropriately placarded. Approximately one truck load per day of “zircon mags” is returned to the island.
  
12. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material.
  
13. The mineral sand being taken back to North Stradbroke Island is known to be insoluble and an existing component of the Island’s natural environment, and so it should not pose any additional risk to the water supply or to vegetation because the radioactive elements are not available because of the insolubility of the mineral.
  
14. In addition to the sands trucked by CRL, approximately 75,000 tonnes of silica sands from a silica sand company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland, and a local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.



### *The regulatory environment*

15. The mining industry operates in a strictly regulated environment under the Mineral Resources Act 1989 and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation, and, as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. The radiological aspects of these arrangements were prepared in liaison with officers from Queensland Health
16. The activities which occur off the mining lease are also strictly regulated. In particular, persons transporting the “zircon mags” are required to be licensed under the Radiation Safety Act 1999 to do so and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the ARPANSA Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at:  
[www.arpansa.gov.au/pubs/rps/rps2\\_2008.pdf](http://www.arpansa.gov.au/pubs/rps/rps2_2008.pdf)
17. Queensland Health’s legislative responsibility is limited to the activities associated with the transport of radioactive materials back to North Stradbroke Island. The legislative responsibility for mining activities on the mining leases on the island lies with the Department of Mines and Energy. The legislative responsibility for the remediation of land both on and off a mining lease lies with the Environmental Protection Agency, and the legislative responsibility for ensuring people are not affected by dust associated with the transport of the mineral sands in areas off a mining lease is the legislative responsibility of Workplace Health and Safety Queensland.
18. Despite all of this, Queensland Health does have an interest in ensuring peoples’ health is not adversely affected by activities associated with sand mining on the island, including past activities.

### **References**

Geoscience Australia, Commonwealth of Australia



Hon Stephen Robertson MP  
Member for Stretton



Minister for Health

MI157449

The Honourable John Mickel MP  
Minister for Transport, Trade,  
Employment and Industrial Relations  
Member for Logan  
GPO Box 2644  
BRISBANE QLD 4001

25 SEP 2008

Dear Minister

I wish to notify you of an issue with regard to mining of mineral sands on North Stradbroke Island.

Questions have been raised by the Stradbroke Island Management Organisation, a concerned citizens group, and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the Island's sand mining activities. The operator of the Island's sand mine is currently seeking to vary the activities it performs on the Island and this is likely to have been a key issue resulting in the raised interest in this matter at this time.

My Department is not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health. My advice to the Stradbroke Island Management Organisation and the media has been in relation to some technical aspects of the mineral sand mining industry, and radiation-related public and environmental health risks. I have attached a technical summary of information that I have provided to the Stradbroke Island Management Organisation and Mr Phil Weightman MP, Member for Cleveland.

Some of the questions raised by the Stradbroke Island Management Organisation are about matters outside my jurisdiction, for example the activities carried out on a mining lease. Queensland Health's legislative responsibility is limited to the activities associated with the transport of radioactive materials back to North Stradbroke Island. It is my understanding that the legislative responsibility for mining activities on the mining leases on the island lies with the Department of Mines and Energy and the legislative responsibility for the remediation of land, both on and off a mining lease, lies with the Environmental Protection Agency. The legislative responsibility for ensuring people are not affected by dust associated with the transport of the mineral sands in areas off a mining lease is the legislative responsibility of Workplace Health and Safety Queensland.

Queensland Health will carry out a series of tests and inspections to determine the nature of the mineral sands and assess health impacts. Testing will include sampling of dust, sampling of material spilled from trucks, sampling of stockpiles, solubility tests and assessments of general dust levels in areas affected by the transport of materials as part of the sand mining operation.

19th Floor State Health Building  
147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia  
Telephone +61 7 3234 1191  
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Website www.health.qld.gov.au



Queensland Health will also carry out inspections to assess the way transport and storage of the zircon mags (the tailings classified as a radioactive substance) is conducted and will determine whether the transport of the mineral sand is in compliance with legislated requirements.

If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents a health risk, Queensland Health will take steps to ensure that practices are rectified and are at acceptable levels of safety. Queensland Health will also continue to monitor the issue to ensure public safety.

I expect that at some stage officers of Queensland Health may wish to conduct testing at a workplace and may seek the advice or cooperation of officers of your Department. I would greatly appreciate it if your Department gave my officers any assistance they may require. Conversely, if officers of your Department require health related advice in relation to this issue, you are welcome to seek that advice from Queensland Health.

Should you have any queries regarding my advice to you, Ms Elise Staples, Policy Advisor, will be pleased to assist you and can be contacted on telephone 3234 1191.

Yours sincerely



**STEPHEN ROBERTSON MP**

RTI RELEASED

## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

Updated 12 September 2008

### *Activities on North Stradbroke Island*

1. Most sand consists of grains of the mineral quartz (SiO<sub>2</sub>). Mineral sands are old sands that contain concentrations of the minerals; rutile, ilmenite, zircon, and monazite.
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12. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material.
  
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14. In addition to the sands trucked by CRL, approximately 75,000 tonnes of silica sands from a silica sand company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland, and a local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.

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18. Despite all of this, Queensland Health does have an interest in ensuring peoples’ health is not adversely affected by activities associated with sand mining on the island, including past activities.

### **References**

Geoscience Australia, Commonwealth of Australia





**Hon Stephen Robertson MP**  
Member for Stretton



**Queensland  
Government**

MI157448

Minister for Health

The Honourable Geoff Wilson MP  
Minister for Mines and Energy  
Member for Ferny Grove  
PO Box 15216  
CITY EAST QLD 4002

**FILE AWAY**

**25 SEP 2008**

Dear Minister 

I wish to notify you of an issue with regard to mining of mineral sands on North Stradbroke Island.

Questions have been raised by the Stradbroke Island Management Organisation, a concerned citizens group, and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the Island's sand mining activities. The operator of the Island's sand mine is currently seeking to vary the activities it performs on the Island and this is likely to have been a key issue resulting in the raised interest in this matter at this time.

My Department is not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health. My advice to the Stradbroke Island Management Organisation and the media has been in relation to some technical aspects of the mineral sand mining industry, and radiation-related public and environmental health risks. I have attached a technical summary of information that I have provided to Stradbroke Island Management Organisation and Mr Phil Weightman MP, Member for Cleveland.

Some of the questions raised by Stradbroke Island Management Organisation are regarding matters outside my jurisdiction, for example the activities carried out on a mining lease. Queensland Health's legislative responsibility is limited to the activities associated with the transport of radioactive materials back to North Stradbroke Island. It is my understanding that the legislative responsibility for mining activities on the mining leases on the Island lies with the Department of Mines and Energy and the legislative responsibility for the remediation of land, both on and off a mining lease, lies with the Environmental Protection Agency. The legislative responsibility for ensuring people are not affected by dust associated with the transport of the mineral sands in areas off a mining lease is the legislative responsibility of Workplace Health and Safety Queensland.

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If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents a health risk, Queensland Health will take steps to ensure that practices are rectified and are at acceptable levels of safety. Queensland Health will also continue to monitor the issue to ensure public safety.

A number of the issues raised by Stradbroke Island Management Organisation relate to work on mining leases and Queensland Health has been asked to investigate radiological issues on those leases. I expect that at some stage officers of Queensland Health may wish to conduct testing on a mining lease and may seek the advice or cooperation of officers of your Department. I would greatly appreciate it if your Department gave my officers any assistance they may require. Conversely, if officers of your Department require health related advice in relation to this issue, you are welcome to seek that advice from Queensland Health.

Should you have any queries regarding my advice to you, Ms Elise Staples, Policy Advisor, will be pleased to assist you and can be contacted on telephone 3234 1191.

Yours sincerely



**STEPHEN ROBERTSON MP**

RTI RELEASED



## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

Updated 12 September 2008

### *Activities on North Stradbroke Island*

1. Most sand consists of grains of the mineral quartz (SiO<sub>2</sub>). Mineral sands are old sands that contain concentrations of the minerals; rutile, ilmenite, zircon, and monazite.
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18. Despite all of this, Queensland Health does have an interest in ensuring peoples’ health is not adversely affected by activities associated with sand mining on the island, including past activities.

### **References**

Geoscience Australia, Commonwealth of Australia

M1159065  
H108109418

**Health Temp Account 1**

**From:** Jackie Cooper [ume@ ]  
**Sent:** Friday, 7 November 2008 11:58 AM  
**To:** Health-SMTP  
**Cc:** Simon\_Critchley@health.qld.gov.au; Lucy Trippett; Fran Quinn; Jennie Truman; Gail Bell; Jan Aldenhoven; Susan Martin; Cleveland  
**Subject:** North Stradbroke Island: monazite  
**Attachments:** pastedGraphic.pdf; ATT01729.htm

Stephen Robertson, MP, Minister, Queensland Health  
 cc Simon Critchley, Director, Radiation Health, Environmental Health Unit, Queensland Health

Dear Mr Robertson

Thank you for your letter of 25 September regarding our concerns about radioactive monazite on North Stradbroke Island.

We appreciate the detailed information you provide about monazite and the regulations that exist to govern its handling, transportation and disposal. We would like to know whether or not a recent inspection has taken place to ensure that the rules are indeed being followed at all stages. And are such inspections routinely conducted?

Our initial queries were in part prompted by observations that trucks returning to the island were not always sealed and typically did not display the appropriate signs. Has this been rectified?

The meeting with Simon Critchley and Queensland Health staff on 22 August was most welcome and enabled us to explain our concerns and discuss remedies. We are pleased that Queensland Health has undertaken to test airborne dust and measure selected sites in and around Dunwich for radioactivity. We look forward to knowing the outcomes of these investigations. The community will benefit from understanding the facts, and whether or not their properties are affected in any way.

Yours sincerely

Jackie Cooper  
 President  
 Stradbroke Island Management Organisation  
 PO Point Lookout 4183  
 3409 8944  
 ume@ ]

*MIN*

**Date Received in ESU:** 17/11/08

**ACTION OFFICER:** PHS (CHD)

Prepare Reply     Minister's signature

URGENT     Standard Response

Briefing Note     Option No.

File Note     Redirect to

NRR for information only     QH Action Direct

**DUE BY:** 10/12/08

**TEMPLATE B on QHEPS**

Comments:  
 \* Refers M1156168 / M1156168 / M1157446 / M1157448 / M1157449

Scanned: 19/11/08 11:57:49

**RECEIVED**  
 MINISTERIAL OFFICE  
 - 7 NOV 2008

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ACTION INFORMATION FILING

*To Dept for:*

BRIEF

REPLY

ACTION INFORMATION

10/11/08 *RS*



AY



Hon Stephen Robertson MP  
Member for Stretton



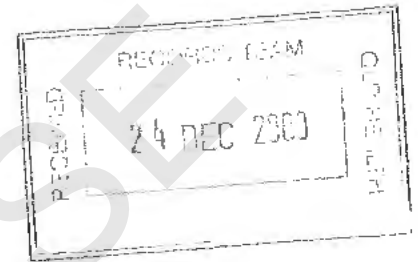
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Queensland  
Government

Minister for Health

MI159065  
MO: H/08/09418

22 DEC 2008

Ms Jackie Cooper  
President  
Stradbroke Island Management Organisation  
PO POINT LOOKOUT QLD 4183



Dear Ms Cooper

Thank you for your email dated 7 November 2008, regarding the monitoring of activities related to mineral sand mining on North Stradbroke Island.

Queensland Health has been preparing to undertake the suite of assessments and monitoring activities required to thoroughly assess the health risks due to radioactivity posed by the mineral sands industry on North Stradbroke Island. These monitoring activities include investigating the transport of radioactive material, air sampling, external radiation dose rate surveys, and radioassays of mineral sand samples.

The activities of my Department in relation to this project include the following:

- (a) An initial walk-over of sites of particular interest to the Stradbroke Island Management Organisation was conducted in the presence of Ms Lucy Trippett, representing your organisation, on 11 September 2008. I am advised that no unusual levels of radiation were found. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment is to be conducted during January 2009.
- (b) Air sampling at Dunwich will commence this month using personal air samplers and a high volume sampler to detect and allow the analysis of respirable dust.
- (c) Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been sent for analysis and the results are expected early in January 2009.

My Department is currently assessing all aspects of Consolidated Rutile Limited's transport of those loads that are radioactive, including the education provided to truck drivers. Consolidated Rutile Limited has been reminded of the requirements for the safe transport of radioactive material, in particular, the requirements for placarding vehicles and covering loads. It is also investigating all aspects of the transport to assess its compliance with the *Radiation Safety Act 1999* and will seek rectification of any deficiencies found.

19th Floor State Health Building  
147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia  
Telephone +61 7 3234 1191  
Facsimile +61 7 3229 4731  
Email health@ministerial.qld.gov.au  
Website www.health.qld.gov.au

With regard to your more general questions about the conduct of routine inspections, the Radiation Health Unit has a routine monitoring program in place to identify and rectify deficiencies across the whole range of radiation activities undertaken in Queensland. One of these activities is the transport of radioactive substances.

Should you have any queries regarding my advice to you, Mr Simon Critchley, Director, Radiation Health Unit, Environmental Health Branch, Queensland Health, will be pleased to assist you and can be contacted on telephone 3406 8006.

Yours sincerely

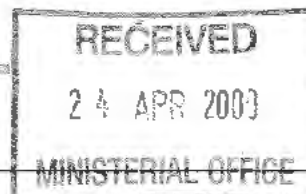


**STEPHEN ROBERTSON MP**

RTI RELEASE



MINISTERIAL



**Crystella Waqa**

**From:** Jackie Cooper [ume@ ]  
**Sent:** Sunday, 19 April 2009 11:32 AM  
**To:** Deputy Premier - SMTP  
**Subject:** North Stradbroke Island: radioactive material  
**Attachments:** Sandgrass.pdf; ATT1058194.htm

Hon Paul Lucas MP, Deputy Premier and Minister for Health  
 19.4.2009

Dear Mr Lucas

**Re MI159065, MO: H/08/09418: Radioactive material on North Stradbroke Island**

SIMO has received a reply from Mr Stephen Robertson MP dated 22.12.08 concerning monitoring of radioactive levels undertaken at Dunwich in September 2008. This followed our request that Health investigate potential health risks associated with the mineral sands industry on NSI. In particular, we are concerned about transportation of radioactive material from Pinkenba to Dunwich in uncovered and/or inappropriately signed or unsigned trucks. Also we raised concerns about possible air-borne material escaping from the returning trucks and from stockpiles in Dunwich.

Mr Robertson advised that a preliminary survey in Dunwich in September found 'no unusual levels of radiation'. Air sampling was to be undertaken at Dunwich in December, in addition to a more extensive radiation survey using new, more sensitive radiation survey equipment, and samples of mineral sands from various stockpiles had been sent for analysis and results were expected in early January. We would like to know the results of the air sampling and radiation surveys as well as the samples analysis when these become available.

Mr Robertson further advised that Consolidate Rutile Limited's transport protocols and training were being assessed. We would like to know what changes, if any, to the mining company's transport procedures have been recommended as a result of this investigation.

SIMO wishes to thank Health and Mr Simon Critchley for undertaking the investigations in Dunwich. The matter of radioactive levels is one of considerable community interest. We look forward to being able to report the Department's completed assessments to the island community soon.

Yours sincerely

Jackie Cooper  
 President  
 Stradbroke Island Management Organisation Inc  
 PO Point Lookout 4183  
 3409 8944  
 ume@  
 www.simo-stradbroke.org

M1159065  
H108/09418

Health Temp Account 1

**From:** Jackie Cooper [ume@redacted]  
**Sent:** Friday, 7 November 2008 11:58 AM  
**To:** Health-SMTP  
**Cc:** Simon\_Critchley@health.qld.gov.au; Lucy Trippett; Fran Quinn; Jennie Truman; Gail Bell; Jan Aldenhoven; Susan Martin; Cleveland  
**Subject:** North Stradbroke Island: monazite  
**Attachments:** pastedGraphic.pdf; ATT01729.htm

Stephen Robertson, MP, Minister, Queensland Health  
 cc Simon Critchley, Director, Radiation Health, Environmental Health Unit, Queensland Health

Dear Mr Robertson

Thank you for your letter of 25 September regarding our concerns about radioactive monazite on North Stradbroke Island.

We appreciate the detailed information you provide about monazite and the regulations that exist to govern its handling, transportation and disposal. We would like to know whether or not a recent inspection has taken place to ensure that the rules are indeed being followed at all stages. And are such inspections routinely conducted?

Our initial queries were in part prompted by observations that trucks returning to the island were not always sealed and typically did not display the appropriate signs. Has this been rectified?

The meeting with Simon Critchley and Queensland Health staff on 22 August was most welcome and enabled us to explain our concerns and discuss remedies. We are pleased that Queensland Health has undertaken to test airborne dust and measure selected sites in and around Dunwich for radioactivity. We look forward to knowing the outcomes of these investigations. The community will benefit from understanding the facts, and whether or not their properties are affected in any way.

Yours sincerely

Jackie Cooper  
 President  
 Stradbroke Island Management Organisation  
 PO Point Lookout 4183  
 3409 8944  
 ume@redacted

*MIN*

Date Received in ESU: 17/11/08

ACTION OFFICER: PHS (CHD)

Prepare Reply  Minister's signature  
 URGENT  Standard Response  
 Option No.  
 Redirect to  
 Briefing Note  QH Action Direct  
 File Note  
 NRR for information only

DUE BY: 10/12/08

TEMPLATE 6 on QHEPS

Comments:  
 \* Refers M1156168/ M1156168/  
 M1157446/ M1157448/  
 Scanned: 1 M1157449

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 - 7 NOV 2008

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MI160794

MO: H/09/00638

05 MAR 2009

RECEIVED  
MINISTERIAL OFFICE

- 6 MAR 2009

Queensland Health  
MINISTERIAL BRIEFING NOTE FOR INFORMATION

TO: Minister Robertson

FROM: Senior Director  
Environmental Health Branch

SUBJECT: North Stradbroke Island mineral sands

Adviser .. <i>[Signature]</i>	OK
Dated 6/3/09	
Noted /	
Further information required	
Minister <i>[Signature]</i>	
Dated 11/3/9	

<input type="checkbox"/>	MINISTER
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<input type="checkbox"/>	PER SEC.
<input checked="" type="checkbox"/>	ADMIN <i>SCAN</i>
<input type="checkbox"/>	ELECTORATE
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<input type="checkbox"/>	INFORMATION
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<input type="checkbox"/>	To Deal for
<input type="checkbox"/>	BRIEF
<input type="checkbox"/>	REPLY
<input type="checkbox"/>	ACTION
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PURPOSE

To inform the Minister of radiation monitoring activities on North Stradbroke Island.

RECOMMENDATION

It is recommended that the Minister note the information contained in this brief.

RECEIVED	RECORDS TEAM	OLD HEALTH
13 MAR 2009		

FUNDING SOURCE

- N/A

CURRENT ISSUES

- Questions have been raised by concerned citizens and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the island's sand mining activities.
- Officers of the Radiation Health Unit have met with representatives of the Stradbroke Island Management Organisation (SIMO) to discuss the organisation's concerns about the mining and processing of mineral sands on North Stradbroke Island.
- Queensland Health has committed to carrying out a series of tests and inspections to determine the nature of the mineral sands and assess health impacts.
- Ms Jackie Cooper of SIMO is seeking information on the outcomes of tests and inspections conducted to date.
- The Department is not aware of any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health.

PROPOSED ACTIONS

- Queensland Health has commenced, and will continue to carry out, tests and inspections to determine the nature of the mineral sands and assess health impacts. The testing performed includes gamma radiation surveys, sampling of stockpiles and material spilled from trucks, solubility tests, sampling of dust and assessments of general dust levels in areas affected by the transport of materials as part of the sand mining operation.
- Queensland Health has commenced, and will continue to carry out inspections to assess the way transport and storage of the zircon mags are conducted to determine whether the transport of the mineral sand is in compliance with legislated requirements.

<b>Author</b> Name: Simon Critchley Position: Director Unit/District: Radiation Health Unit Tel No: 3406 8006 Date: 24 February 2009	<b>Cleared by (ED)</b> Name: Dr Linda Selvey Position: Executive Director Unit/District: Population Health Queensland Tel No: 3234 1145 Date: 4 March 2009	<b>Cleared by (CHO)</b> Name: Dr Jeannette Young Position: Chief Health Officer Tel No: 3234 1137 Date: 4 March 2009	<b>DG</b>  <i>W</i>  <i>6/3</i>
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- If the results of any testing or inspections show that any part of the storage or transport of mineral sands is found to be non-compliant or presents a health risk, Queensland Health will take steps to ensure that practices are rectified and are at acceptable levels of safety. Queensland Health will also continue to monitor the issue to ensure public safety.

## BACKGROUND

- Australia has extensive deposits of mineral sands which comprise of titanium minerals (rutile, ilmenite), zircon and monazite. Most of Australia's mineral sands occur on the east coast of Australia between Sydney and Fraser Island and on the southern section of the coast of Western Australia, and have been mined since the 1930's.
- Zircon contains small amounts of the radioactive elements uranium and thorium, and monazite may also contain the radioactive element thorium. The monazite in the mineral sands mined on North Stradbroke Island does contain the radioactive element thorium and it is the monazite which is the predominant source of the radioactivity in the mineral sands extracted from this location.
- Questions have been raised by concerned citizens about the processing of mineral sand, and deposits of mineral sand in landfill on various properties at Dunwich. The questions seem to have been prompted by observations of dust and spillage of material from trucks travelling to North Stradbroke Island, but might also have been prompted as a result of a recent proposal by the operator of the sand mining company (Consolidated Rutile Limited) to vary its mining related activities.
- A technical summary about the North Stradbroke Island mineral sand mining industry is attached.
- Queensland Health is conducting a series of tests and inspections to determine the nature of the mineral sands and assess health impacts. Activities include:
  - reassessment of records of sites known, or suspected, to have been affected by elevated levels of radioactive material;
  - gamma radiation surveys of the above sites;
  - sampling and radio-assay of stockpiles of mineral sands;
  - sampling and radio-assay of material spilled from trucks;
  - sampling of dust and assessments of general dust levels in areas affected by the transport of mineral sand;
  - solubility tests of mineral sands; and
  - inspections to assess the way transport and storage of the zircon mags is conducted to determine whether the transport of the mineral sand is in compliance with legislated requirements.
- An initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted in September 2008. No unusual radiation levels were found. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment will be conducted when further testing of the equipment is complete.
- Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted in December 2008 using personal air samplers and a high volume sampler. No measurable amount of radioactive material was detected in the samples.
- Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. The concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results confirm that only the unwanted material described as "zircon mags", from one of the processing streams, has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the *Radiation Safety Act 1999*.

<b>Author</b> Name: Simon Critchley Position: Director Unit/District: Radiation Health Unit Tel No: 3406 8006 Date: 24 February 2009	<b>Cleared by (ED)</b> Name: Dr Linda Selvey Position: Executive Director Unit/District: Population Health Queensland Tel No: 3234 1145 Date: 4 March 2009	<b>Cleared by (CHO)</b> Name: Dr Jeannette Young Position: Chief Health Officer Tel No: 3234 1137 Date: 4 March 2009	<b>DG</b>
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- The “zircon mags” are required to be transported in accordance with the ARPANSA Code of Practice for the Safe Transport of Radioactive Material. Inspections carried out in September and December 2008 to investigate compliance with the transport requirements, revealed the “zircon mags” being returned to the island were transported in covered trucks bearing radiation warning placards. The vehicles had only two placards rather than the three placards required by the Code of Practice. Consolidated Rutile Limited (CRL) have been reminded of the requirements for transport of radioactive material, in particular the requirements for placarding of vehicles.
- The Radiation Health Unit is currently reassessing the transport training course provided by CRL to its drivers. Radiation Health had, during the early part of this reassessment, identified a need for CRL to modify part of the training course. Assessment of the modified training package is continuing.

#### **MEDIA IMPLICATIONS AND KEY MESSAGES**

- Radiation is an emotive issue and the media and public may perceive a greater risk than is actually the case. It is important that consistent messages are presented to the media and the public and that correct language is used.

#### **ATTACHMENTS**

- Attachment 1 - North Stradbroke Island Mineral Sand Mining Industry – Technical and Regulatory Summary (23 February 2009).
- Attachment 2 – Letter addressed to Ms Jackie Cooper for Minister’s signature – MI160794.

#### **MINISTER’S COMMENTS**

<b>Author</b> Name: Simon Critchley Position: Director Unit/District: Radiation Health Unit Tel No: 3406 8006 Date: 24 February 2009	<b>Cleared by (ED)</b> Name: Dr Linda Selvey Position: Executive Director Unit/District: Population Health Queensland Tel No: 3234 1145 Date: 4 March 2009	<b>Cleared by (CHO)</b> Name: Dr Jeannette Young Position: Chief Health Officer Tel No: 3234 1137 Date: 4 March 2009	<b>DG</b>
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## North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

Updated 23 February 2009

### *Activities on North Stradbroke Island*

1. Most sand consists of grains of the mineral quartz (SiO<sub>2</sub>). Mineral sands are old sands that contain concentrations of the minerals; rutile, ilmenite, zircon, and monazite.
  - Rutile and ilmenite are oxides containing the element titanium.
  - Zircon is a silicate containing the element zircon.
  - Monazite is a phosphate containing the elements cerium, lanthanum, neodymium, and thorium in various proportions.
2. In 2007, approximately 50,000,000 tonnes of sand was mined on North Stradbroke Island by Consolidated Rutile Pty Ltd. The desired minerals (Rutile, Zircon, Ilmenite) account for about 0.6% of the mass mined.
3. The mineral sand being mined on North Stradbroke Island is separated, on the island, into two streams; a “rutile-zircon stream” (containing 0.3% monazite by weight) and an “ilmenite stream” (containing 0.1% monazite by weight).
4. There are no chemicals used in the mining and processing of mineral sands. The separation on North Stradbroke Island is done by physical methods. No chemical changes to any minerals are effected during the process. Physical processes used at the North Stradbroke Island mine sites include screening, wet gravity and magnetic separation. The processes used are;
  - Screening, that relies on different particle sizes.
  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
5. In 2007 approximately 171,000 tonnes of sand in the “rutile-zircon stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand is temporarily stored at Dunwich in enclosed bins.
6. In the same year approximately 195,000 tonnes of sand in the “ilmenite stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand (with the lower concentration of monazite) is temporarily stored in an open stockpile.

### *Processing at Pinkenba*

7. The mineral sand is processed at Pinkenba by physical separation of its components into a number of streams. No chemical changes to any minerals are effected during the process.

8. There are no chemicals used in the processing of mineral sands. Separation techniques used in the concentration and processing of mineral sands rely solely on the physical characteristics of the different minerals. Physical processes used at the Pinkenba processing plant include screening, wet gravity, magnetic and electrostatic separations. The processes used are;
  - Screening, that relies on different particle sizes.
  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
  - Electrostatic separation, that relies on the different surface conductivity of the minerals.
  
9. After processing by physical separation, the useful minerals (rutile, ilmenite and zircon) are packaged for sale. There are three streams of unwanted material:
  - “ilmenite reject” containing approximately 0.5% monazite by weight,
  - “zircon tails” containing approximately 1% monazite by weight,
  - “zircon mags” containing approximately 10% monazite by weight.

#### *Return of tailings to North Stradbroke Island*

10. Of the 34,000 tonnes of material returned to North Stradbroke Island in 2007:
  - 15,000 tonnes was “ilmenite reject”,
  - 13,000 tonnes was “zircon tails”,
  - 6,000 tonnes was “zircon mags”.
  
11. The level of radioactivity in the “zircon mags” is such that this material is regulated under the Radiation Safety Act 1999, hence this material is required to be transported back to the island in accordance with that Act. The ilmenite reject and the zircon tails are not classified as being radioactive due to their very low concentrations of radioactive elements. The “zircon mags” returned to the island is transported by covered trucks using the public ferry. Additionally, the trucks carrying the “zircon mags” have sealed tailgates and are required to be appropriately placarded. Approximately one truck load per day of “zircon mags” is returned to the island.
  
12. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material.
  
13. The mineral sand being taken back to North Stradbroke Island is known to be insoluble and an existing component of the Island’s natural environment, and so it should not pose any additional risk to the water supply or to vegetation because the radioactive elements are not available because of the insolubility of the mineral.
  
14. In addition to the sands trucked by CRL, approximately 75,000 tonnes of silica sands from a silica sand company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland, and a local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.

### *The regulatory environment*

15. Within the bounds of the mining leases on North Stradbroke Island, the mining industry operates in a strictly regulated environment under the Mineral Resources Act 1989 and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation, and, as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. The radiological aspects of these arrangements were prepared in liaison with officers from Queensland Health
16. The activities which occur off the mining lease are also strictly regulated. During the separation of the components of the mineral sands, the material known as “zircon mags” is collected and, due to its elevated levels of radioactivity, this material is regulated under the Radiation Safety Act 1999. In particular, persons transporting the “zircon mags” are required to be licensed to do so and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the ARPANSA Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at: [www.arpansa.gov.au/pubs/rps/rps2\\_2008.pdf](http://www.arpansa.gov.au/pubs/rps/rps2_2008.pdf)
17. Queensland Health’s legislative responsibility is limited to the activities associated with the transport of radioactive materials back to North Stradbroke Island. The legislative responsibility for mining activities on the mining leases on the island lies with the Department of Mines and Energy. The legislative responsibility for the remediation of land both on and off a mining lease lies with the Environmental Protection Agency, and the legislative responsibility for ensuring people are not affected by dust associated with the transport of the mineral sands in areas off a mining lease is the legislative responsibility of Workplace Health and Safety Queensland.
18. Despite all of this, Queensland Health does have an interest in ensuring peoples’ health is not adversely affected by activities associated with sand mining on the island, including past activities.

### *Sites on North Stradbroke Island affected by radiological material*

19. Queensland Health has a record of 78 sites on North Stradbroke Island that have been investigated for radiological contamination, most usually by landfill containing mineral sands.
20. In the 1980’s, Queensland Health conducted radiation surveys on these sites and determined whether remediation was required. Queensland Health was involved in monitoring remedial action.
21. The records relating to these sites were reassessed approximately 10 years ago with a view to making a determination about whether the sites should be recorded on the Environmental Protection Agency’s Environmental Management Register (EMR).



22. Most of the assessed sites did have some elevated level of radioactive material and Queensland Health advised the Environmental Protection Agency that those sites should be listed on the EMR.

*Summary of Radiation Health's radiation monitoring activities*

23. Queensland Health is conducting a series of tests and inspections to determine the nature of the mineral sands and assess health impacts. Activities include:
- reassessment of records of sites known, or suspected, to have been affected by elevated levels of radioactive material
  - gamma radiation surveys of the above sites
  - sampling and radio-assay of stockpiles of mineral sands
  - sampling and radio-assay of material spilled from trucks
  - sampling of dust and assessments of general dust levels in areas affected by the transport of mineral sand
  - solubility tests of mineral sands
  - inspections to assess the way transport and storage of the zircon mags is conducted to determine whether the transport of the mineral sand is in compliance with legislated requirements.
24. An initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted in September 2008. No unusual levels of radiation were found. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment will be conducted when further testing of the equipment is complete.
25. Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted in December 2008 using personal air samplers and a high volume sampler. No measurable amount of radioactive material was detected in the samples.
26. Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. The concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results show that only the material described as "zircon mags" has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the Radiation Safety Act 1999.
27. Inspections carried out in September and December 2008 to investigate compliance with the transport requirements revealed the "zircon mags" being returned to the island were transported in covered trucks bearing radiation warning placards. The vehicles had only two placards rather than the three placards required by the Code of Practice. CRL have been reminded of the requirements for transport of radioactive material, in particular the requirements for placarding of vehicles.
28. The Radiation Health Unit is currently reassessing the transport training course provided by Consolidated Rutile Limited to its drivers.

**References**

Geoscience Australia, Commonwealth of Australia

RTI RELEASE

MI160794

6

**Michael Jennings**

**From:** Jackie Cooper [ume@ ]  
**Sent:** Wednesday, 28 January 2009 11:29 AM  
**To:** Health-SMTP  
**Cc:** Lucy Trippett; Fran Quinn; Jennie Truman; Gail Bell; Jan Aldenhoven; Susan Martin; Simon Baltais  
**Subject:** Monitoring radioactive material on NSI  
**Attachments:** Monazite, reply to min.pdf



Monazite, reply to min.pdf (16...

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**Date Received in ESU:** 4/2/09

**ACTION OFFICER:** PHS (CHO)

Prepare Reply     Minister's signature

URGENT     Standard Response

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**DUE BY:** 25/2/09

**TEMPLATE B** on QHEPS

**Comments:** PREVIOUS: MI159065  
MI156035

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 29 JAN 2009

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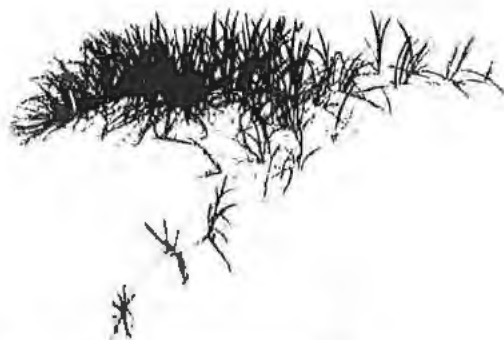
FOR DIRECTION  
FOR INFORMATION  
HEALTH  
(SIMON  
CUTCHER)  
PHS



M1160794

Stradbroke Island Management Organisation Inc  
PO Point Lookout, 4183  
3409 8944

ume@



Hon Stephen Robertson MP  
Minister for Health  
health@ministerial.qld.gov.au

28.1.2009

Dear Minister

Thank you for your letter of 22 December 2008 (your ref MI159065, MO: H/08/09418) responding to concerns we have raised about the possibility of flaws in the way radioactive material is transported to North Stradbroke Island and public anxiety about radioactivity in Dunwich.

We appreciate the response of your department in implementing a suite of investigations and monitoring to assess the health risks of radioactivity. We are very interested to know all the results from these monitoring operations, as well investigations into CRL's protocols for transporting radioactive loads and education of drivers.

Your letter indicates that results will be known soon of the radiation survey of sites in Dunwich (conducted in January); air sampling at Dunwich (December); and analysis of mineral sand and material returned to NSI (early January).

We look forward to having these findings.

Thank you again for your department's prompt response to this matter.

Yours sincerely

Jackie Cooper  
President



Hon Stephen Robertson MP  
Member for Stretton



Queensland  
Government

MI160794  
MO: H/09/00638

Minister for Health

Ms Jackie Cooper  
President  
Stradbroke Island Management Organisation Inc  
POINT LOOKOUT QLD 4183

Dear Ms Cooper

Thank you for your email dated 28 January 2009, regarding the monitoring of activities related to mineral sand mining on North Stradbroke Island, carried out by Consolidated Rutile Limited (CRL).

As you would be aware, a State election has been called for 21 March 2009 and the Government is now in caretaker mode. On this basis, I can only respond to you on operational matters. As the issues you raise are of an operational nature, I advise as follows.

As advised in a previous letter to you, an initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted in September 2008. I am advised that no unusual levels of radiation were found. For your information, I have attached a map showing the areas surveyed and the radiation levels measured. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment scheduled for January 2009 has been delayed until further testing of the equipment is complete.

Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted in December 2008 using personal air samplers and a high volume sampler. I am advised that no radioactive material was detected in the samples.

Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. I am advised that the concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results confirm that only the unwanted material described as "zircon mags", from one of the processing streams, has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the *Radiation Safety Act 1999*.

The "zircon mags" are required to be transported in accordance with the ARPANSA Code of Practice for the Safe Transport of Radioactive Material. I am advised that inspections carried out in September and December 2008 to investigate compliance with the transport requirements revealed the "zircon mags" being returned to the island were transported in covered trucks bearing radiation warning placards. I am further advised though, that the way the vehicles were placarded was inconsistent with the requirements and the company concerned has been reminded of its obligations in this respect.

19th Floor State Health Building  
147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia  
Telephone +61 7 3234 1191  
Facsimile +61 7 3229 4731  
Email [health@ministerial.qld.gov.au](mailto:health@ministerial.qld.gov.au)  
Website [www.health.qld.gov.au](http://www.health.qld.gov.au)

The Radiation Health Unit in my Department is currently reassessing the transport training course provided by CRL to drivers of these vehicles. During the early part of this review, Radiation Health had identified a need for CRL to modify part of its training course and assessment of the modified training course is continuing.

Should you have any queries regarding my advice to you, Mr Simon Critchley, Director, Radiation Health Unit, Queensland Health, will be pleased to assist you and can be contacted on telephone 3406 8006.

Yours sincerely



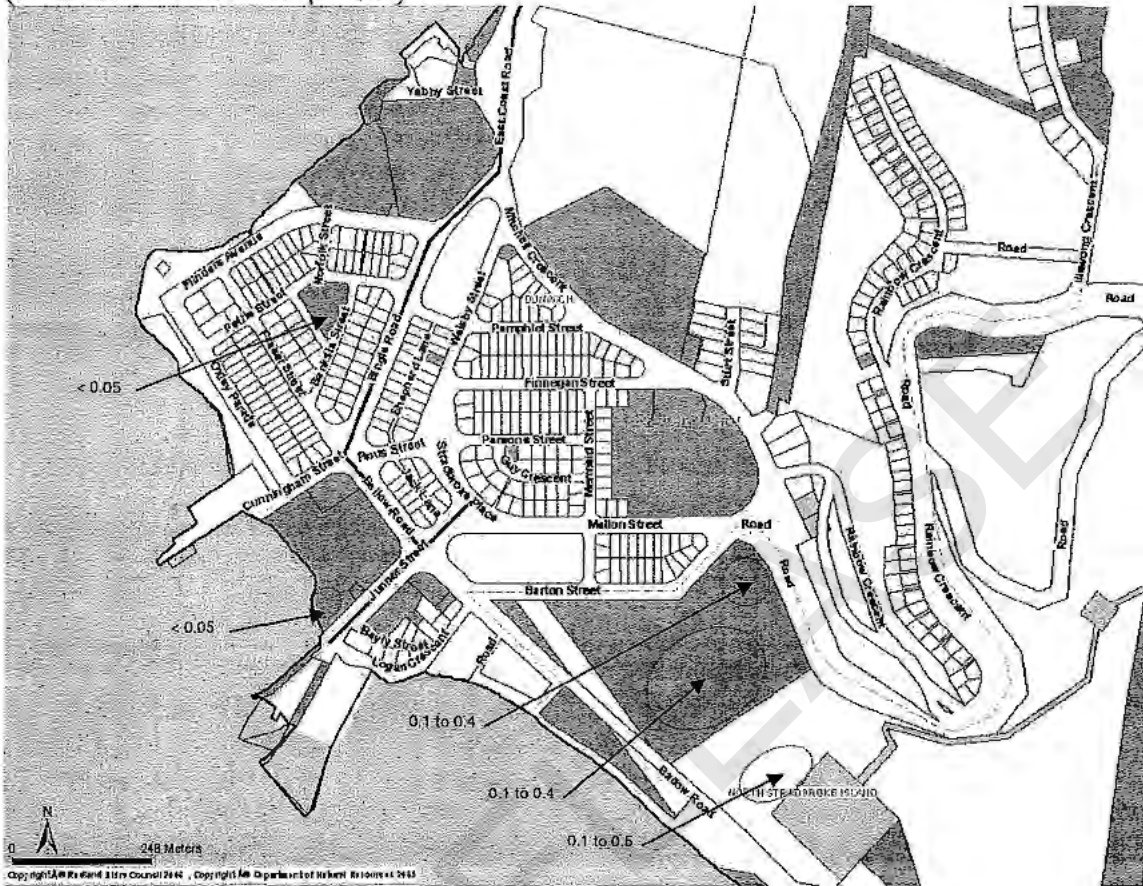
**STEPHEN ROBERTSON MP**

RTI RELEASE



# Gamma radiation dose levels at selected locations in Dunwich 11-09-2008

(Radiation levels are in  $\mu\text{Sv/hr}$ )



Measurements made with Bicron microSievert (s/n B405E)

## Gamma radiation dose survey – Dunwich 11-09-2008

Location	Dose ( $\mu\text{Sv/hr}$ )
Park at Banksia Street	< 0.05
Park at beach, Junner Street	<0.05
Forest, cnr Mallon Street & Mitchell Crescent	0.1 to 0.4
Park, Ballow Road	0.1 to 0.4
“1 million tonne hot sand pile” (on CRL mining lease)	0.1 to 0.5

Typical background level is between 0.05 to 0.1  $\mu\text{S/hr}$

RTI RELEASED



11 2 009

# QUEENSLAND HEALTH BRIEF FOR NOTING

Our Ref: MI162680  
 Date: 25 May 2009  
 TO Parliamentary Secretary to the Minister for Health  
 FROM Director, Radiation Health Unit, Environmental Health Branch  
 SUBJECT North Stradbroke Island Mineral Sands  
 Requested by Ms Tess Bishop, Health Specialist Advisor

## RECOMMENDATION(S)

- That you sign the attached letter to Ms Jackie Cooper, President, Stradbroke Island Management Organisation updating her on the Department's investigations into whether there are public health risks due to the mineral sands industry on North Stradbroke Island. (MI162680)

## BACKGROUND SUMMARY

- Questions were raised last year by concerned citizens and the media about the safe storage and transport of mineral sands to and from North Stradbroke Island and related mining activities on the island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the island's sand mining activities. A technical summary about the North Stradbroke Island mineral sand mining industry and some of the initial observations made during this project is attached. (Attachment 1)
- Officers of the Radiation Health Unit met with representatives of the Stradbroke Island Management Organisation (SIMO) to discuss the organisation's concerns about the mining and processing of mineral sands on North Stradbroke Island.
- Queensland Health committed to carrying out a series of tests and inspections to determine the nature of the mineral sands and assess associated health impacts.
- On the 13 March 2009, the then Minister for Health sent Ms Jackie Cooper of SIMO the results of some initial testing of North Stradbroke Island (refer attachment 3 - MI160794), but Ms Cooper has not acknowledged receipt of this correspondence in her email to the Deputy Premier dated 19 April 2009. Ms Cooper is seeking further information on the outcomes of further tests which have been conducted, as well as the results of the assessment of Consolidated Rutile Limited's (CRL) transport protocols and associated training.
- Although tests are continuing, the Department has not yet discovered any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health, from a radiological perspective.

*done by who, when?*

*approx time that this will be completed?*

*whole brief should have more detail*

*times/ places of this ~~chain~~ of events, i.e. first letter from SIMO on xxxx meeting w/ SIMO on xxx started testing on xxxx*

Page 1 of 4



- Some minor deficiencies in areas such as the signage on transport vehicles were noted during the period initial observations were being made. CRL has now amended its training course to emphasise correct procedures in these previously deficient areas.

## ISSUES

- The radiological assessments and other work requested by the concerned citizens on North Stradbroke Island is significant, necessitating liaison with the Department of Mines and investigation of sites both within the mining lease on the island and in publicly accessible areas. These investigations take time and are, in part, iterative in nature because part of the process agreed to involved on-site liaison with representatives of SIMO. This liaison has taken place and SIMO is aware of the timeframes and the complexity of the work however, understandably, they are keen to ensure this work reaches a satisfactory end point. Details of the work conducted to date are attached. (Attachment 2)

## CONSULTATION WITH STAKEHOLDERS

- Stradbroke Island Management Organisation (SIMO) – discussions have been held with representatives of SIMO to ascertain their areas of interest. Initial results were forwarded to Ms Cooper by the previous Minister for Health (refer to attached – MI160794).

## FINANCIAL IMPLICATIONS

- No additional funding has been required, to date.

## ATTACHMENTS

- Attachment 1 - North Stradbroke Island Mineral Sand Mining Industry – Technical & Regulatory Summary (23 February 2009)
- Attachment 2 - Investigations and tests conducted in relation to North Stradbroke Island Mineral Sands
- Attachment 3 – Copy of previous correspondence from Ms Cooper dated 28 January 2009 and response.
- Attachment 4 – Letter of response for signature by the Parliamentary Secretary – MI162680.

NOTED or APPROVED / NOT APPROVED		
<b>Parliamentary Secretary to the Minister for Health</b>		
<b>Comments</b>		
Paul Lucas Parliamentary Secretary to the Minister for Health	Principal/Senior Policy Advisor	Policy Advisor
/ /	/ /	/ /

#### Political Representatives

##### Local Government


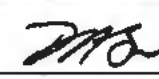
- Councillor Craig Ogilvie, Redland City Council, Division 2 Cleveland, North Stradbroke Island.
- No specific involvement/interest known or contact made on behalf of residents.

##### State Government

- The Hon Stephen Robertson MP, Minister for Natural Resources, Mines and Energy and Minister for Trade
- Dr Mark Robinson MP, Member for Cleveland.
- The previous State Member for Cleveland, the Honourable Phillip Weightman MP, was a strong advocate of SIMO and a meeting at North Stradbroke Island was held with the Hon Weightman and SIMO in relation to this matter.

##### Federal Government

- Mr Andrew Laming MP, Member for Bowman.
- No specific involvement/interest known or contact made on behalf of residents.

<b>Author:</b> Simon Critchley Director Radiation Health Unit, Environmental Health Branch 07 3328 9200	Signed on: 25 May 2009	<b>Cleared by: (DM/SD/Dir)</b> Ms Sophie Dwyer A/Executive Director, Population Health Queensland 07 3328 9306	Signed on: 4 June 2009
<b>Cleared by:</b> Dr Aaron Groves Deputy Director General Division of the Chief Health Officer 07 3328 9000	Signed on: 5 June 2009	<b>Endorsed:</b> Prof Andrew Wilson A/Director-General	  <hr/> 817109

Election Commitment

CBRC / Cabinet related

ECM related

RTI RELEASE





Office of the Minister for Health

MI162680

Ms Jackie Cooper  
 President  
 Stradbroke Island Management Organisation  
 Email: [ume@](mailto:ume@)

23 OCT 2009  
 Emailed  
 23/10/09

Dear Ms Cooper

I write in response to your email dated 19 April 2009, regarding the monitoring of activities relating to mineral sand mining on North Stradbroke Island carried out by Consolidated Rutile Limited (CRL). The Deputy Premier has asked that I respond on his behalf. I apologise for the delay in responding.

In his letter to you dated 13 March 2009, the previous Minister for Health, the Honourable Stephen Robertson MP, provided you with information about the radiation monitoring results from work conducted up until February this year, and about the transport of processed material returning to the island.

While further mineral sand sampling and measurements of local radiation levels were conducted with more sensitive radiation survey equipment in March and April this year, the results of this monitoring are yet to be finalised.

Further to the information contained in Minister Robertson's letter dated 13 March 2009, the Radiation Health Unit in Queensland Health has assessed the transport training course provided by CRL to the drivers of the vehicles carrying material that is regulated under the *Radiation Safety Act 1999*. While all essential safety requirements were appropriately covered by the original course, improvements were suggested in regard to signage and administrative requirements. As a consequence of this, CRL has modified its training course accordingly.

The work you have requested is continuing and I encourage you to liaise directly with Mr Simon Critchley, Director, Radiation Health Unit, Queensland Health, about its progress. Mr Critchley will be pleased to assist you and can be contacted on telephone (07) 3328 9200.

Yours sincerely

**CAMERON CROWTHER**  
**Principal Advisor**

19th Floor State Health Building  
 147-163 Charlotte Street Brisbane  
 GPO Box 48 Brisbane  
 Queensland 4001 Australia  
 Telephone +61 7 3234 1191  
 Facsimile +61 7 3229 4731

MIN. M1162680

Date Received in ESU: 5/5/09

ACTION OFFICER: DHS (CHE)

Prepare Reply  <sup>PARL SEC</sup> Minister's signature

URGENT  Standard Response

Briefing Note  Option No.

File Note  Redirect to

NRR for information only  QH Action Direct

DUE BY: 26/5/09

TEMPLATE B on QHEPS

Comments:  
 \* Refers M1160794/M1159121/  
 M1159065/M1156168/  
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RTI REQUEST PLEASE

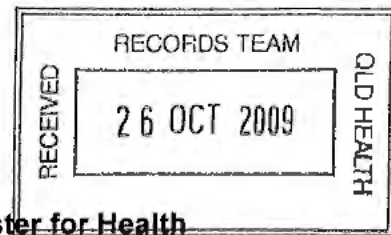
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19

**QUEENSLAND HEALTH  
BRIEF FOR NOTING**

Our Ref: MI162680  
 Date: 7 August 2009  
 TO: Parliamentary Secretary to the Minister for Health  
 FROM: Director, Radiation Health Unit, Environmental Health Branch  
 SUBJECT: North Stradbroke Island Mineral Sands  
 Requested by: Ms Tess Bishop, Health Specialist Advisor



FILE AWAY

**RECOMMENDATION(S)**

- That you sign the attached letter to Ms Jackie Cooper, President, Stradbroke Island Management Organisation updating her on the Department's investigations into whether there are public health risks due to the mineral sands industry on North Stradbroke Island (MI162680).

**BACKGROUND SUMMARY**

- Questions were raised last year by a group of concerned citizens (Stradbroke Island Management Organisation) and the media (Sun Herald) about the safe storage and transport of mineral sands to and from North Stradbroke Island and related mining activities on the island. The questions seem to have been prompted by observations of dust and spillage of material being taken from, or returned to, North Stradbroke Island as part of the island's sand mining activities carried out by Consolidated Rutile Limited (CRL). A technical summary prepared by the Radiation Health Unit, Environmental Health Branch and updated on 7 August 2009 about the North Stradbroke Island mineral sand mining industry and some of the initial observations made during this project is attached (attachment 1).
- Queensland Health first became aware of this issue through an email sent on 12 June 2008 by Ms Jackie Cooper, representing the Stradbroke Island Management Organisation (SIMO) to the Honourable Andrew McNamara MP, then Minister for Sustainability, Climate Change and Innovation, Member for Hervey Bay, regarding the transport of mineral sands to and from North Stradbroke Island. Ms Cooper's letter was forwarded to the Minister for Health for response.
- Officers of the Radiation Health Unit met on Friday 22 August 2008 with representatives of SIMO and Mr Phillip Weightman, former Member for Cleveland to discuss the organisation's concerns about the mining and processing of mineral sands on North Stradbroke Island.
- Queensland Health committed to carrying out a series of tests and inspections to determine the nature of the mineral sands and assess associated health impacts. The first investigations on North Stradbroke Island commenced on 11 September 2008 and subsequent investigations were carried out in December 2008, March 2009 and April 2009. Details of the work conducted by the Radiation Health Unit are attached (attachment 2).



- In September and December 2008, officers of the Radiation Health Unit carried out inspections to investigate compliance with the transport requirements of the *Radiation Safety Act 1999*. Some minor deficiencies in areas such as the signage on transport vehicles were noted during this time.
- From December 2008 to February 2009 the Radiation Health Unit assessed the transport training course provided by CRL to its drivers. The Radiation Health Unit had, during the early part of this reassessment, identified a need for CRL to modify part of the training course. CRL has now amended its training course to emphasise correct procedures.
- On 13 March 2009, the former Minister for Health sent Ms Jackie Cooper of SIMO the results of some initial testing conducted on North Stradbroke Island (refer attachment 3 - MI160794), but Ms Cooper did not acknowledge receipt of this correspondence in her email to the Deputy Premier dated 19 April 2009. Ms Cooper is seeking further information on the outcomes of the tests which have been conducted, as well as the results of the assessment of CRL's transport protocols and associated training.
- The Department has not yet discovered any evidence to suggest that the material being transported to and from Stradbroke Island is adversely affecting occupational or public health, from a radiological perspective. Tests are continuing and it is expected that, for the purposes of this project, investigations will be completed by the end of June 2010.

## ISSUES

- The radiological assessments and other work requested by the concerned citizens on North Stradbroke Island is significant, necessitating liaison with the Department of Employment, Economic Development and Innovation and investigation of sites both within the mining lease on the island and in publicly accessible areas. These investigations take time and are, in part, iterative in nature because part of the process agreed to involved on-site liaison with representatives of SIMO. SIMO is aware of the timeframes and the complexity of the work however, understandably, they are keen to ensure this work reaches a satisfactory end point.

## CONSULTATION WITH STAKEHOLDERS

- Stradbroke Island Management Organisation (SIMO) – discussions have been held with representatives of SIMO to ascertain their areas of interest. Initial results were forwarded to Ms Cooper by the previous Minister for Health (refer to attachment 3 – MI160794).

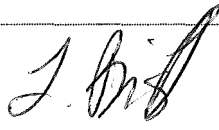
## FINANCIAL IMPLICATIONS

- No additional funding has been required, to date.

## ATTACHMENTS

- Attachment 1 - North Stradbroke Island Mineral Sand Mining Industry – Technical and Regulatory Summary (7 August 2009)
- Attachment 2 - Investigations and tests conducted in relation to North Stradbroke Island Mineral Sands (7 August 2009)
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- Attachment 4 – Letter of response for signature by the Parliamentary Secretary – MI162680.

NOTED or APPROVED / NOT APPROVED <b>Parliamentary Secretary to the Minister for Health</b> Comments		
 Paul Lucas Parliamentary Secretary to the Minister for Health / /		
Principal/Senior Policy Advisor 23, 10, 09		
Policy Advisor / /		

**Political Representatives**

**Local Government**

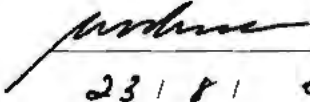
- Councillor Craig Ogilvie, Redland City Council, Division 2 Cleveland, North Stradbroke Island.

**State Government**

- The Honourable Stephen Robertson MP, Minister for Natural Resources, Mines and Energy and Minister for Trade
- Mr Mark Robinson MP, Member for Cleveland.
- The former Member for Cleveland, Mr Phillip Weightman, was a strong advocate of SIMO and a meeting at North Stradbroke Island was held with Mr Weightman and SIMO in relation to this matter.

**Federal Government**

- Mr Andrew Laming MP, Member for Bowman.

<b>Author:</b> Simon Critchley Director Radiation Health Unit, Environmental Health Branch 3328 9200	<b>Signed on:</b> 7 August 2009	<b>Cleared by: (ED)</b> Sophie Dwyer A/Executive Director, Population Health Queensland 3328 9306	<b>Signed on:</b> 19 August 2009
<b>Cleared by: (DDG)</b> Dr Aaron Groves Deputy Director General Division of the Chief Health Officer 3328 9000	<b>Signed on:</b> 19 August 2009	<b>Endorsed:</b> Michael Reid Director-General	 23 / 8 / 09

Election Commitment

CBRC / Cabinet related

ECM related

RTI RELEASE



## Attachment 1

### North Stradbroke Island Mineral Sand Mining Industry – Technical Summary

Updated 23 February 2009

#### *Activities on North Stradbroke Island*

1. Most sand consists of grains of the mineral quartz (SiO<sub>2</sub>). Mineral sands are old sands that contain concentrations of the minerals; rutile, ilmenite, zircon, and monazite.
  - Rutile and ilmenite are oxides containing the element titanium.
  - Zircon is a silicate containing the element zircon.
  - Monazite is a phosphate containing the elements cerium, lanthanum, neodymium, and thorium in various proportions.
2. In 2007, approximately 50,000,000 tonnes of sand was mined on North Stradbroke Island by Consolidated Rutile Pty Ltd. The desired minerals (Rutile, Zircon, Ilmenite) account for about 0.6% of the mass mined.
3. The mineral sand being mined on North Stradbroke Island is separated, on the island, into two streams; a “rutile-zircon stream” (containing 0.3% monazite by weight) and an “ilmenite stream” (containing 0.1% monazite by weight).
4. There are no chemicals used in the mining and processing of mineral sands. The separation on North Stradbroke Island is done by physical methods. No chemical changes to any minerals are effected during the process. Physical processes used at the North Stradbroke Island mine sites include screening, wet gravity and magnetic separation. The processes used are;
  - Screening, that relies on different particle sizes.
  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
5. In 2007 approximately 171,000 tonnes of sand in the “rutile-zircon stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand is temporarily stored at Dunwich in enclosed bins.
6. In the same year approximately 195,000 tonnes of sand in the “ilmenite stream” were removed from the island to Pinkenba by barge. Prior to being loaded into the barge this sand (with the lower concentration of monazite) is temporarily stored in an open stockpile.

#### *Processing at Pinkenba*

7. The mineral sand is processed at Pinkenba by physical separation of its components into a number of streams. No chemical changes to any minerals are effected during the process.

8. There are no chemicals used in the processing of mineral sands. Separation techniques used in the concentration and processing of mineral sands rely solely on the physical characteristics of the different minerals. Physical processes used at the Pinkenba processing plant include screening, wet gravity, magnetic and electrostatic separations. The processes used are;
  - Screening, that relies on different particle sizes.
  - Wet gravity, that relies on different specific gravity for each mineral.
  - Magnetic separation, that relies on the different magnetic properties of the minerals.
  - Electrostatic separation, that relies on the different surface conductivity of the minerals.
9. After processing by physical separation, the useful minerals (rutile, ilmenite and zircon) are packaged for sale. There are three streams of unwanted material:
  - “ilmenite reject” containing approximately 0.5% monazite by weight,
  - “zircon tails” containing approximately 1% monazite by weight,
  - “zircon mags” containing approximately 10% monazite by weight.

#### ***Return of tailings to North Stradbroke Island***

10. Of the 34,000 tonnes of material returned to North Stradbroke Island in 2007:
  - 15,000 tonnes was “ilmenite reject”,
  - 13,000 tonnes was “zircon tails”,
  - 6,000 tonnes was “zircon mags”.
11. The level of radioactivity in the “zircon mags” is such that this material is regulated under the Radiation Safety Act 1999, hence this material is required to be transported back to the island in accordance with that Act. The ilmenite reject and the zircon tails are not classified as being radioactive due to their very low concentrations of radioactive elements. The “zircon mags” returned to the island is transported by covered trucks using the public ferry. Additionally, the trucks carrying the “zircon mags” have sealed tailgates and are required to be appropriately placarded. Approximately one truck load per day of “zircon mags” is returned to the island.
12. When returned to North Stradbroke Island, the “zircon mags” are returned to the mining lease where they are covered with 10 metres of clean material to reduce the hazard posed by the elevated levels of radioactivity in this material.
13. The mineral sand being taken back to North Stradbroke Island is known to be insoluble and an existing component of the Island’s natural environment, and so it should not pose any additional risk to the water supply or to vegetation because the radioactive elements are not available because of the insolubility of the mineral.
14. In addition to the sands trucked by CRL, approximately 75,000 tonnes of silica sands from a silica sand company, not containing monazite, is also removed from the island each year by trucks using the public ferry from Dunwich to Cleveland, and a local concrete company also takes approximately 10,000 tonnes of river sands and gravel to North Stradbroke Island each year.

### ***The regulatory environment***

15. Within the bounds of the mining leases on North Stradbroke Island, the mining industry operates in a strictly regulated environment under the Mineral Resources Act 1989 and other mining legislation. The arrangements for dealing with the material returned to the mining lease have been developed under this legislation, and, as a part of these arrangements, there is a requirement for on-going environmental and radiological monitoring and analysis. The radiological aspects of these arrangements were prepared in liaison with officers from Queensland Health
16. The activities which occur off the mining lease are also strictly regulated. During the separation of the components of the mineral sands, the material known as “zircon mags” is collected and, due to its elevated levels of radioactivity, this material is regulated under the Radiation Safety Act 1999. In particular, persons transporting the “zircon mags” are required to be licensed to do so and the requirements to be met during the transport of the material are identical to those required both nationally and internationally. These requirements are specified in the ARPANSA Code of Practice for the Safe Transport of Radioactive Material which is available on the internet at: [www.arpansa.gov.au/pubs/rps/rps2\\_2008.pdf](http://www.arpansa.gov.au/pubs/rps/rps2_2008.pdf)
17. Queensland Health’s legislative responsibility is limited to the activities associated with the transport of radioactive materials back to North Stradbroke Island. The legislative responsibility for mining activities on the mining leases on the island lies with the Department of Mines and Energy. The legislative responsibility for the remediation of land both on and off a mining lease lies with the Environmental Protection Agency, and the legislative responsibility for ensuring people are not affected by dust associated with the transport of the mineral sands in areas off a mining lease is the legislative responsibility of Workplace Health and Safety Queensland.
18. Despite all of this, Queensland Health does have an interest in ensuring peoples’ health is not adversely affected by activities associated with sand mining on the island, including past activities.

### ***Sites on North Stradbroke Island affected by radiological material***

19. Queensland Health has a record of 78 sites on North Stradbroke Island that have been investigated for radiological contamination, most usually by landfill containing mineral sands.
20. In the 1980’s, Queensland Health conducted radiation surveys on these sites and determined whether remediation was required. Queensland Health was involved in monitoring remedial action.
21. The records relating to these sites were reassessed approximately 10 years ago with a view to making a determination about whether the sites should be recorded on the Environmental Protection Agency’s Environmental Management Register (EMR).



22. Most of the assessed sites did have some elevated level of radioactive material and Queensland Health advised the Environmental Protection Agency that those sites should be listed on the EMR.

***Summary of Radiation Health's radiation monitoring activities***

23. Queensland Health is conducting a series of tests and inspections to determine the nature of the mineral sands and assess health impacts. Activities include:
- reassessment of records of sites known, or suspected, to have been affected by elevated levels of radioactive material
  - gamma radiation surveys of the above sites
  - sampling and radio-assay of stockpiles of mineral sands
  - sampling and radio-assay of material spilled from trucks
  - sampling of dust and assessments of general dust levels in areas affected by the transport of mineral sand
  - solubility tests of mineral sands
  - inspections to assess the way transport and storage of the zircon mags is conducted to determine whether the transport of the mineral sand is in compliance with legislated requirements.
24. An initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted in September 2008. No unusual levels of radiation were found. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment will be conducted when further testing of the equipment is complete.
25. Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted in December 2008 using personal air samplers and a high volume sampler. No measurable amount of radioactive material was detected in the samples.
26. Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. The concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results show that only the material described as "zircon mags" has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the Radiation Safety Act 1999.
27. Inspections carried out in September and December 2008 to investigate compliance with the transport requirements revealed the "zircon mags" being returned to the island were transported in covered trucks bearing radiation warning placards. The vehicles had only two placards rather than the three placards required by the Code of Practice. CRL have been reminded of the requirements for transport of radioactive material, in particular the requirements for placarding of vehicles.
28. The Radiation Health Unit is currently reassessing the transport training course provided by Consolidated Rutile Limited to its drivers.

**References**

Geoscience Australia, Commonwealth of Australia

RTI RELEASE

## Attachment 2

### Investigations and tests conducted in relation to North Stradbroke Island Mineral Sands

#### Radiation Monitoring

- Queensland Health is conducting a series of tests and inspections to determine the nature of the mineral sands at certain locations on North Stradbroke Island (both on and off mining leases) and assess health impacts associated with the mining, processing and transport (both to and from the island) of those sands. This involves:
  - reassessment of the records of sites known to have been, or suspected of having been, affected by elevated levels of radioactive material
  - gamma radiation surveys of the above sites
  - sampling and radio-assay of stockpiles of mineral sands
  - sampling and radio-assay of material spilled from trucks
  - sampling of dust and assessments of general dust levels in areas affected by the transport of mineral sands
  - solubility tests of mineral sands
  - inspections to assess the way transport of the 'zircon mags' (processed mineral sands containing a high percentage of monazite) is conducted to determine whether the transport of this material is in compliance with the legislation
  - inspections to assess the way the return of the 'zircon mags' to the mining lease is conducted to ensure it is consistent with good radiological practice.

- The following surveys and measurements have been conducted to date:

#### *September 2008*

- An initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted. No unusual radiation levels were found.

#### *December 2008*

- Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted using personal air samplers and a high volume sampler. No measurable amount of radioactive material was detected in the samples.
- Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. The concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results confirm that only the unwanted material described as 'zircon mags', from one of the processing streams, has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the *Radiation Safety Act 1999*.

#### *March 2009*

- An on-site visit at Consolidated Rutile Ltd, North Stradbroke Island was conducted with a Department of Mines representative to discuss the mining process and relevant health and safety concerns
- Further samples of mineral sand were taken from the mine site where initial separation of the mineral sands occurs, and from rehabilitated areas. These samples are currently being analysed by Queensland Health Forensic and Scientific Services. The results are yet to be received.



April 2009

- Personal air sampling and radiation levels measured at various publicly accessible locations in Dunwich have been conducted and the results are still being analysed.

#### **Transport of Material by Consolidated Rutile Ltd**

- The 'zircon mags' are required to be transported in accordance with the ARPANSA *Code of Practice for the Safe Transport of Radioactive Material (2008)*. Inspections carried out in September and December 2008 to investigate compliance with the transport requirements revealed the 'zircon mags' being returned to the island were transported in covered trucks bearing radiation warning placards. The vehicles had only two placards rather than the three placards required by the Code of Practice. CRL were reminded of the requirements for transport of radioactive material, in particular the requirements for placarding of vehicles. CRL subsequently reviewed its procedures.
- The Radiation Health Unit has reassessed the transport training course provided by Consolidated Rutile Limited (CRL) to its drivers. CRL has consequently modified part of its training package to ensure the Code of Practice is met by its contractors.

RTI RELEASE



Hon Stephen Robertson MP  
Member for Stretton



Queensland  
Government

MI160794  
MO: H/09/00638

Minister for Health

Ms Jackie Cooper  
President  
Stradbroke Island Management Organisation Inc  
POINT LOOKOUT QLD 4183

Dear Ms Cooper

Thank you for your email dated 28 January 2009, regarding the monitoring of activities related to mineral sand mining on North Stradbroke Island, carried out by Consolidated Rutile Limited (CRL).

As you would be aware, a State election has been called for 21 March 2009 and the Government is now in caretaker mode. On this basis, I can only respond to you on operational matters. As the issues you raise are of an operational nature, I advise as follows.

As advised in a previous letter to you, an initial walk-over of selected sites (those of interest to Stradbroke Island Management Organisation) was conducted in September 2008. I am advised that no unusual levels of radiation were found. For your information, I have attached a map showing the areas surveyed and the radiation levels measured. A more extensive radiation survey of these areas using new, more sensitive, radiation survey equipment scheduled for January 2009 has been delayed until further testing of the equipment is complete.

Initial trials of air sampling near the Junner Street jetty at Dunwich were conducted in December 2008 using personal air samplers and a high volume sampler. I am advised that no radioactive material was detected in the samples.

Samples of mineral sand taken from various stockpiles, including the material returned to North Stradbroke Island, have been analysed. I am advised that the concentrations of uranium and thorium in these samples are consistent with previous measurements of samples taken from similar locations. Additionally, the results confirm that only the unwanted material described as "zircon mags", from one of the processing streams, has a high enough concentration of radionuclides to be classified as a radioactive substance and therefore subject to regulation under the *Radiation Safety Act 1999*.

The "zircon mags" are required to be transported in accordance with the ARPANSA Code of Practice for the Safe Transport of Radioactive Material. I am advised that inspections carried out in September and December 2008 to investigate compliance with the transport requirements revealed the "zircon mags" being returned to the island were transported in covered trucks bearing radiation warning placards. I am further advised though, that the way the vehicles were placarded was inconsistent with the requirements and the company concerned has been reminded of its obligations in this respect.

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147-163 Charlotte Street Brisbane  
GPO Box 48 Brisbane  
Queensland 4001 Australia  
Telephone +61 7 3234 1191  
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Website www.health.qld.gov.au

The Radiation Health Unit in my Department is currently reassessing the transport training course provided by CRL to drivers of these vehicles. During the early part of this review, Radiation Health had identified a need for CRL to modify part of its training course and assessment of the modified training course is continuing.

Should you have any queries regarding my advice to you, Mr Simon Critchley, Director, Radiation Health Unit, Queensland Health, will be pleased to assist you and can be contacted on telephone 3406 8006.

Yours sincerely



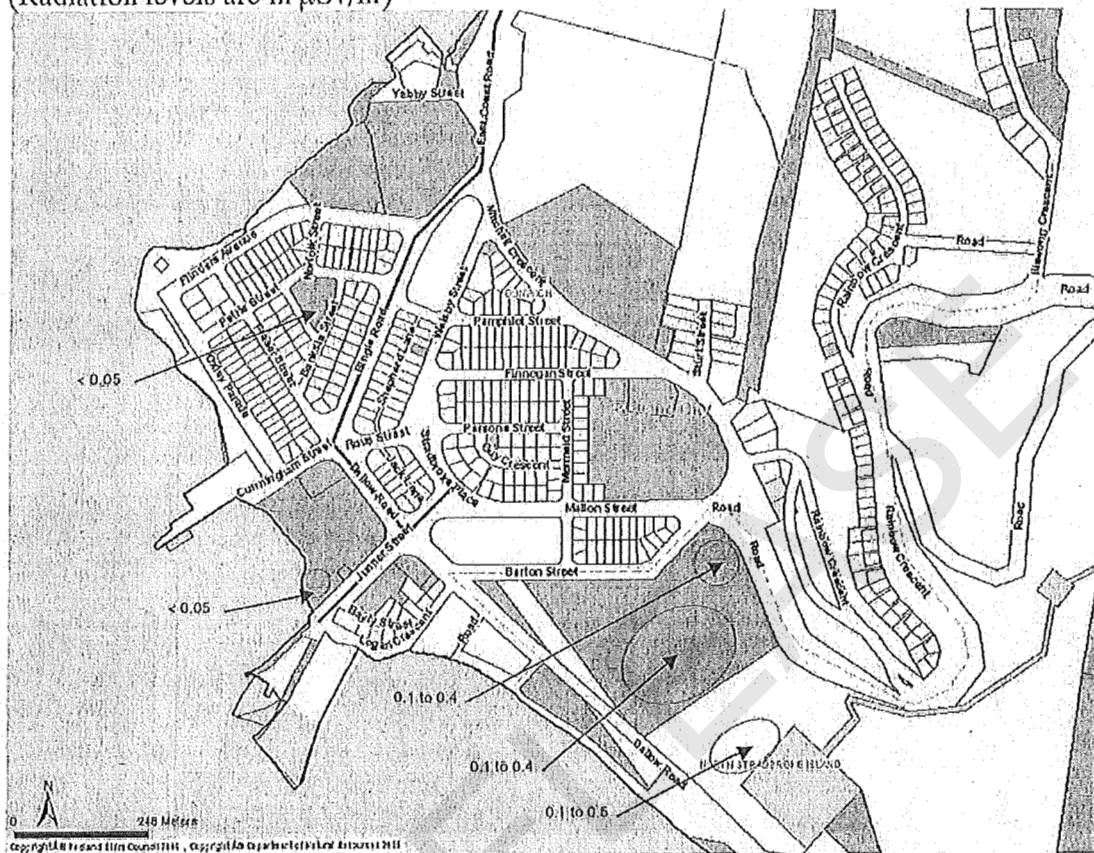
STEPHEN ROBERTSON MP

RTI RELEASE



### Gamma radiation dose levels at selected locations in Dunwich 11-09-2008

(Radiation levels are in  $\mu\text{Sv/hr}$ )



Measurements made with Bicon microSievert (s/n B405E)

## Gamma radiation dose survey – Dunwich 11-09-2008

Location	Dose ( $\mu\text{Sv/hr}$ )
Park at Banksia Street	< 0.05
Park at beach, Junner Street	<0.05
Forest, enr Mallon Street & Mitchell Crescent	0.1 to 0.4
Park, Ballow Road	0.1 to 0.4
“1 million tonne hot sand pile” (on CRL mining lease)	0.1 to 0.5

Typical background level is between 0.05 to 0.1  $\mu\text{S/hr}$

RTI RELEASED

M1160794

Stradbroke Island Management Organisation Inc  
PO Point Lookout, 4183  
3409 8944

ume@



Hon Stephen Robertson MP  
Minister for Health  
health@ministerial.qld.gov.au

28.1.2009

Dear Minister

Thank you for your letter of 22 December 2008 (your ref M1159065, MO: H/08/09418) responding to concerns we have raised about the possibility of flaws in the way radioactive material is transported to North Stradbroke Island and public anxiety about radioactivity in Dunwich.

We appreciate the response of your department in implementing a suite of investigations and monitoring to assess the health risks of radioactivity. We are very interested to know all the results from these monitoring operations, as well investigations into CRL's protocols for transporting radioactive loads and education of drivers.

Your letter indicates that results will be known soon of the radiation survey of sites in Dunwich (conducted in January); air sampling at Dunwich (December); and analysis of mineral sand and material returned to NSI (early January).

We look forward to having these findings.

Thank you again for your department's prompt response to this matter.

Yours sincerely

Jackie Cooper  
President



**From:** Stephen Carter  
**To:** Hedges Kevin  
**Date:** 26/02/2010 3:25 pm  
**Subject:** Re: FW: MRE 03 March 2009 (Yarraman Mine) - Radiation Dose Report (Final)  
**Attachments:** Comment on NSI dose report - K Hedges.pdf

Kevin

Attached are my comments on the report. In short, it lacks clarity about a few things & could be improved by including more detail about how personal doses are derived from the area measurements and dust monitoring.

The alpha monitoring is very basic.

Safe Radiation is a company run by Dr Riaz Akber. He has extensive experience in radiation measurements associated with naturally occurring radioactive material. I understand that he is able to use the laboratory facilities at Queensland University of Technology to analyse samples.

regards  
 Stephen

Stephen Carter  
 Senior Radiation Health Adviser  
 Radiation Health Unit  
 Environmental Health Branch  
 Level 1  
 15 Butterfield Street  
 Herston Qld 4006

Phone: (07) 3328 9202  
 Fax: (07) 3328 9622  
 web: [www.health.qld.gov.au/radiationhealth](http://www.health.qld.gov.au/radiationhealth)

>>> "Hedges Kevin" <[Kevin.Hedges@deedi.qld.gov.au](mailto:Kevin.Hedges@deedi.qld.gov.au)> 17/02/2010 2:32 pm >>>  
 Stephen,

Thought you might be interested in this report from Yarraman.

Would you mind providing a comment. Do you think that this report adequately covers dose from alpha emitters?

What do you know about safe radiation

**From:** Moyle, Christine  
**Sent:** Wednesday, 27 January 2010 4:16 PM  
**To:** Hedges Kevin  
**Subject:** MRE 03 March 2009 (Yarraman Mine) - Radiation Dose Report (Final)

Good afternoon Kevin

Please find attached the final Radiation Dose Report relating to MRE dated 03 March 2009.

Can you please advise if you are still at the Townsville office so that a hard copy can be forwarded.

Regards

Christine Moyle  
(Telephone 07 3409 6830)

\*\*\*\*\*

The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business. If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.

\*\*\*\*\*

RTI RELEASED



Enquiries to: Stephen Carter  
 Telephone: 3328 9202  
 E-mail: Stephen\_Carter@health.qld.gov.au  
 Our Ref:

Kevin Hedges  
 Senior Principal Occupational Hygienist  
 Queensland Mines and Energy,  
 Department of Employment, Economic Development and Innovation,  
 PO Box 1752  
 Townsville Qld 4810

Dear Kevin

### 2009 North Stradbroke Island (NSI) Radiation Dose Report

I have had a look at the report. In general the report lacks information about methodology and how personal doses are derived.

There are a number of questions:

- If employee doses are estimated from area monitoring (whether it is external gamma or dust), what is the methodology to convert this to personal dose?
- Did anyone actually wear a personal radiation monitoring device?
- If employee doses are estimated from personal dust monitoring, what is the method used to convert dust activity to personal dose?

Methodology is important enough for it to be in the report. I understand that in the proposed national radiation dose register, methodology is something that is intended to be recorded so that we can go back and make comparisons or adjustments to personal dose if required.

#### *Gamma monitoring*

I am not sure that any person actually wore a personal radiation monitoring device. The results appear to be derived from area monitors, though the methodology is not clear.

#### *Alpha monitoring*

The program of alpha monitoring looks as though it was only personal dust monitoring of 8 people over the course of one day using 4 monitors. I don't know how many people are employed on NSI, but this does not seem adequate.



*Comment on report*

My specific comments about the report are as follows. (The report text is boxed.)

FOCUSING QUESTIONS

Is routine radiation monitoring on North Stradbroke Island required?

Radiation monitoring is required. I believe there is a potential for personal radiation dose to exceed 1mSv/year, the level above which monitoring is required.

CONCLUSIONS

Based on the low calculated radiation dose for CRL workers on North Stradbroke Island and no foreseeable changes to the mining operations on North Stradbroke Island, recommend that detailed radiation dose reports are not completed yearly.

Personal radiation doses should be reported annually. The level of detail in the report is something that could be reduced provided there is a standard methodology used to determine personal dose. Doses could then simply be reported with a note that they were determined using the standard method.

INTRODUCTION

A summary of the approach to monitoring is as follows:

- Inhalation dose was estimated using data from a high-volume sampling data generated in 2005, and passive radon ( $^{222}\text{Rn}$ ) and thoron ( $^{220}\text{Rn}$ ) monitors, located throughout the dry mill at Holt Street;
- Inhalation dose from dust was calculated using data obtained from personnel dust monitoring equipment.
- Ingestion dose was not calculated. Wipe tests were completed to ensure surface contamination is below the laboratory standard.
- External radiation exposure measured using environmental TLD badges.

Dot point 2 mentions monitoring at the dry mill at Holt Street which is in Pinkenba. I thought this report was for doses on North Stradbroke Island.

MONITORING REGIME

The dose assessment required measurements to ascertain the radiation exposure. The following methods were used to determine exposure due to inhalation, ingestion and external gamma.

1. External gamma was measured using environmental monitors placed throughout the operation. The monitors were installed for 84 days between 29th June 2009 and the 20th of September 2009. Table 1 in the appendix shows the results obtained and the monitor location. The monitors were supplied and analysed by the Australian Radiation Protection And Nuclear Safety Agency (ARPANSA).
2. Radon monitoring was not completed in this program. The radon exposure was calculated using the levels measured at the dry mill. This assumes worst case exposure.
3. Wipes tests were performed to determine the removable contamination that could be ingested. Table 2 in the appendix shows the results from the tests. The equipment was supplied and analysed by Safe Radiation. Ingestion radiation dose was not calculated using this information, as the wipes tests indicated extremely low measurements.
4. Personnel dust monitoring was completed by CRL using SKC equipment. Filter papers from the equipment were sent to Safe Radiation for radiation analysis. Results are shown in Table 3 in the appendix.

#### *Dot point 1*

This is area monitoring and if the dosimeters were treated as environmental monitors it is possible that background radiation may not have been subtracted from these reported results. It is not clear if this is the case.

The results in Table 1 show that in some areas (Loader 238, Dry mill tails), depending on occupancy of the areas, it may be possible for a person to receive more than 1mSv/year. Although there is a section on "Occupancy Factors" in the report, I don't know how they were used to estimate personal dose.

If doses are estimated from area monitoring, what is the methodology to convert this to personal dose?

#### *Dot point 2*

I agree radon will be far less of an inhalation hazard outdoors on NSI than it would be in the dry mill. If radon exposure has been calculated, it would be interesting to see what the result is in this report so that at least we have an upper bound. I presume that this relates to dot point 1 in the "Introduction" which says that inhalation dose was estimated using data from Holt Street.

#### *Dot point 3*

Wipe test results are acceptably low. Provided simple hygiene rules are followed, the dose due to ingestion should be insignificant.

Table 2 states the tests were completed using a procedure obtained from Safe Radiation. It would be useful to have the procedure described in this report.

#### *Dot point 4*

The quantity of dose per unit volume is unusual. It is more usual to quote the quantity measured by the dust monitors - usually an activity concentration (eg. Bq/cm<sup>2</sup> of a radionuclide deposited on a filter), then explain the method used to convert this to a personal dose in Sieverts.

The report gives no indication about the type of activities performed by the day crew. What proportion of their time is spent in a dusty environment, and is it representative of all workers?

The methodology for converting dust concentration to a personal dose is not described in enough detail in the report. It is not clear that the method described in Appendix B has been used - Appendix B says most of its information from work done by Queensland Health Scientific Services in 2005, the current report uses an analysis by Safe Radiation.

#### Exposure Summary

Table 4 in the appendix provides an estimate of the annual occupational doses that workers at Consolidated Rutile Limited (NSI Mining Operations) are exposed to during the course of their work. All estimates were calculated at less than 1mSv/yr.

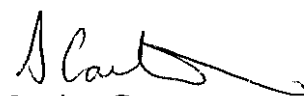
It is not clear what this annual dose in Table 4 is, and how it is arrived at.

- Is it for external gamma radiation only, or is it a combined total of external and inhalation doses.
- Does it include a dose estimate based on radon inhalation referred to in the sections "Introduction" and "Monitoring Regime"?
- Does it include a dose estimate based on personal dust monitoring?
- If it is based on area monitoring for external gamma, what is the methodology to convert this to personal dose?
- If it includes data from personal dust monitoring, what is the methodology to convert this to personal dose?

Although annual personal radiation doses are reported to be less than 1mSv, there remains a potential for doses to exceed 1mv/year. Consequently, radiation dose estimates for employees (or categories of employees) should continue to be reported annually.

The current report would be improved if there was more information about the methods used to determine annual dose, and a statement about which pathways contribute to the reported annual dose estimate (ie. external, inhalation or both).

Yours sincerely



Stephen Carter  
**Senior Radiation Health Adviser**  
 26 February 2010



**From:** Paula Veevers  
**To:** Stephen Carter  
**Date:** 20/05/2010 1:02 pm  
**Subject:** Fwd: Advice - inconsistency identification for dust levels/monitoring conditions for CRL Pinkenba  
**Attachments:** Attachment 1 Current air conditions.doc; Attachment 2 recent dust conditions.doc

This one actually has attachments!

>>> "Kelley Prowse" <[kelley.prowse@derm.qld.gov.au](mailto:kelley.prowse@derm.qld.gov.au)> 20/05/2010 12:14 pm >>>

**Dear Paula,**

I am seeking advice/suggestions on a couple of conditions regarding dust management objectives for the **CRL mineral processing plant in Pinkenba**. The dust at this site is of a higher risk as radioactive nuclei are concentrated in some of the materials stockpiled on site.

While on site Manager, Paul Smith, mentioned that Simon Critchley had been in contact with the site to develop a Radiation Safety and Protection Plan. I was hoping someone in your team could consider a couple of conditions for consistency with Radiation Health requirements in the latest iteration of the licence for mineral processing which will now include conditioning for bulk materials handling (stockpiling sand products on site).

**Attachment 1:** current dust conditions

**Attachment 2:** proposed additional conditions for ambient monitoring

**Are there any conflicts in the monitoring DERM requires and the requirements of Radiation Health?**

**Background:**

This plant receives mineral sands from North Stradbroke Island and separates them into ilmenite, rutile and zircon products for sale. There are also several stockpiles of dry mill tailings on site, one of which, the zircon tails contains monazite and has an elevated external radiation dose of 24.09 uSv/hr. While the site workers have been found to have external radiation does far less than the industry requirement of <20 mSv/year there are some site workers are above the safe level for the general public of 1 mSv/year as reported in the Radiation Safety and Protection Plan of June 2006.

Particle size analysis showed that the majority of particles in the stock piles on site are approximately 50 µm or between 80-100 µm.

Although it wasn't particularly windy yesterday when we were viewing the barge unloading procedure the amount of sand in the air was uncomfortable at times on the site.

Please contact me in this regards and to seek any further information.

<<Attachment 1 Current air conditions.doc>> <<Attachment 2 recent dust conditions.doc>>

Many thanks,  
Kelley Prowse

**Kelley Prowse**

Environmental Officer | Redlands | Regional Service Delivery | South East Region

**Department of Environment and Resource Management**

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4th Floor, LandCentre, Cnr Main & Vulture Streets, WOOLLOONGABBA QLD 4102

GPO Box 2771, BRISBANE QLD 4001

+-----+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+-----+

Current air conditions:

### **Nuisance**

- A1 The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive place.
- A2 The release of dust and/or particulate matter resulting from the activities authorised by this development approval must not cause an environmental nuisance at any nuisance sensitive place.
- A3 Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); OR
  - b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre ( $\mu\text{m}$ ) (PM10) suspended in the atmosphere of 150 micrograms per cubic metre over a 24 hour averaging time when monitored in accordance with:
    - i) Australian Standard AS 3580.9.6 of 2003 (or more recent editions) 'Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method'; or
    - ii) Any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.
- A4 When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of nuisance caused by dust and/or particulate matter, and the results notified within 14 days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place and at upwind control sites and must include:
- a) for a complaint alleging dust nuisance, dust deposition; and
  - b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre ( $\mu\text{m}$ ) (PM10) suspended in the atmosphere over a 24hr averaging time.
- A9 **The Release Of Contaminants To The Atmosphere**
- The release of contaminants to the atmosphere from a point source must only occur from those release points identified in Table 1 - Contaminant release limits to air, and must be directed vertically upwards without any impedance or hindrance.
- A10 Contaminants must be released to the atmosphere from a release point at a height and flow rate not less than the corresponding height and velocity stated for that release point in Table 1 – Contaminant release limits to air.
- A11 Contaminants must not be releases to the atmosphere from a release point at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in Table 1 – Contaminant release limits to air.
- A12 Contaminants must be monitored not less frequently than specified in Table 1 – Contaminant release limits to air.

- A13 All release points referred to in Table 1 – Contaminant release limits to air must be conspicuously marked with the corresponding release point number.

**Table 1 - Contaminant release limits to air**

Release point number	Description of release point	Minimum release height (metres)	Minimum velocity (m/sec)	Contaminant release	Maximum release limit	Sampling frequency
1	Rutile separation plant fluidised bed drier	22	8	Total particulates	0.1 g/Nm <sup>3</sup>	At least 2 separate days annually
				Carbon monoxides	0.35 g/Nm <sup>3</sup>	
				Nitrogen oxides	1.0 g/Nm <sup>3</sup>	
2	Zircon separation plant rotary drier	12	8	Total particulates	0.1 g/Nm <sup>3</sup>	
				Carbon monoxides	0.35 g/Nm <sup>3</sup>	
				Nitrogen oxides	1.0 g/Nm <sup>3</sup>	
3	Ilmenite separation plant rotary drier	10	8	Total particulates	0.1 g/Nm <sup>3</sup>	
				Carbon monoxides	0.35 g/Nm <sup>3</sup>	
				Nitrogen oxides	1.0 g/Nm <sup>3</sup>	

- A15 Monitoring of any releases to the atmosphere required by a condition of this approval must be carried out in accordance with the following requirements:
- Monitoring provisions for the release points listed in Table 1 - Contaminant release limits to air must comply with the Australian Standard AS 4323.1 - 1995 'Stationary source emissions Method 1: Selection of sampling positions' (or more recent editions).
  - The following tests must be performed for each required determination specified in Table 1 - Contaminant release limits to air:
    - gas velocity and volume flow rate;
    - temperature;
    - water vapour concentration (moisture content).
  - Where practicable, samples must be taken when emissions are expected to be at maximum rates.
  - During the sampling period the following additional information must be gathered:
    - production rate at the time of sampling;
    - raw materials used;
    - number of equipment and mixing vessels operating;
    - operating or mixing temperature;
    - product made; and
    - reference to the actual test methods and accuracy of the methods.



### Dust Management Objectives

**A11** The release of dust must comply with the following levels:

#### Dust Deposition

- a) Less than **four (4) grams** per square metre per month (total insoluble solids) at site boundaries nearest the closest residential premises at the points;

residential premises at the points;

- c) Less than **three (3) grams** per square metre per month (total insoluble solids) at any nuisance sensitive place; and  
 d) Less than **one (1) gram** per square metre per month at any nuisance sensitive place.

#### Total Suspended Particulates (TSP)

- a) Less than 150 micrograms per cubic metre expressed as a twenty-four (24) hour average at the site boundary; and  
 b) Less than 200 micrograms per cubic metre expressed as a one (1) hour average at the site boundary.

#### PM10 Particulates

- a) Less than 150 micrograms per cubic metre expressed as a twenty-four (24) hour average at the site boundary; and  
 b) Less than 50 micrograms per cubic metre expressed as an annual average at the site boundary.

### Ambient Dust Monitoring

**A12** The holder of this development approval must conduct a dust monitoring program for the parameters and at the frequency specified in Table 1, at the locations listed in Table 2.

**A13** Monitoring provisions for the release points listed in Schedule B, Table 1 must comply with:

- a) For **dust deposition**, Australian Standard AS 3580, 10.1, 2003 *Determination of Particulates - Deposited Matter - Gravimetric Method*;
- b) For **Total Suspended Particulate**, Australian Standard AS 3580.9.3:2003 *Method for sampling and analysis of ambient air - Determination of suspended particulate matter - Total suspended particulate matter (TSP) High volume sampler gravimetric method*; or any alternative method of monitoring TSP which may be permitted by the administering authority;
- c) For health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre ( $\mu\text{m}$ ) (**PM10**), suspended in the atmosphere over a twenty-four (24) hour averaging time when measured using AS 3580.9.8:2001 *Method 9.8: Determination of suspended particulate matter-PM10 continuous direct mass method using a tapered element oscillating microbalance analyser*, or any alternative method of monitoring PM10 which may be permitted by the administering authority.

Table 1 – Air monitoring requirements

Determination Required	Monitoring Location	Frequency
mass deposition rate of insoluble solids	DM1, DM2, DM3, DM4	Monthly
mass deposition rate of ash	DM1, DM2, DM3, DM4	Monthly
mass deposition rate of total solids	DM1, DM2, DM3, DM4	Monthly
combustible matter	DM1, DM2, DM3, DM4	Monthly
Compositional analysis (%) +	DM1, DM2, DM3, DM4	Monthly
particle identification +	DM1, DM2, DM3, DM4	Monthly
Total suspended particulate matter (TSP)	DM1, DM2, DM3, DM4	Continually (instrument availability not less than 80% in any 30 day period)
PM10	DM1, DM2, DM3, DM4	Continually (instrument availability not less than 80% in any 30 day period)

+ means required when dust levels are exceeded.

Table 2 – Continuous monitoring locations

Site number	Site Description
DM1	Real Time Monitoring on the West perimeter (Figure 1)
DM2	Real Time Monitoring on the Far West perimeter (Figure 1)
DM3	Real Time Monitoring on the South West perimeter (Figure 1)
DM4	Real Time Monitoring on the South perimeter (Figure 1)

- A14** The holder of this development approval shall submit a report to the administering authority every **three (3) months** on the results of dust monitoring in a format requested by the administering authority, and remedial actions taken to prevent or minimise any dust emissions.

**From:** Stephen Carter  
**To:** Kelley Prowse  
**Date:** 8/06/2010 4:07 pm  
**Subject:** RE: CRL Pinkenba licence

Hi Kelley

I can not see any conflict between the DERM monitoring requirements and the requirements of Radiation Health.

I have compared your dust management levels with the disposal requirements in the Radiation Safety Act 1999. Dust deposition levels (120mg/m<sup>2</sup>/day or 3-4g/m<sup>2</sup>/month) were compared to our criteria for disposal to ground and particulate levels (150µg/m<sup>3</sup>) were compared to our criteria for disposal to air.

It appears that the DERM criteria for dust deposition are far more stringent than the equivalent radionuclide disposal criteria - if CRL disposed of mineral sand at the DERM levels it would result in a soil radionuclide concentration far less than our disposal criteria.

For dust in air, the DERM criteria for most of the mineral sand is equivalent to a radionuclide concentration less than our disposal criteria.

It is only for the zircon-mags (one of the waste stream returned to North Stradbroke) that a concentration of 150µg/m<sup>3</sup> in air would be at about the same as our criteria for disposal to air (0.004Bq/m<sup>3</sup> for uranium and 0.007Bq/m<sup>3</sup> for thorium). However, as I understand it, this material remains undercover so the likelihood of dispersal into the environment is very low.

I think that if CRL comply with DERM's criteria then they should be compliant with Radiation Health's disposal criteria.

To date our monitoring has not revealed any area of non-compliance that would be a cause for concern in regard to adverse health effects.

regards  
Stephen Carter

Stephen Carter  
Senior Radiation Health Adviser  
Radiation Health Unit  
Environmental Health Branch  
Level 1  
15 Butterfield Street  
Herston Qld 4006

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>>> "Kelley Prowse" <[kelley.prowse@derm.qld.gov.au](mailto:kelley.prowse@derm.qld.gov.au)> 7/06/2010 4:09 pm >>>



Hi Stephen,

I will need to finalise the conditions for this permit shortly. Are you able to offer any comment on the proposed conditions relating to dust management from the stockpiled materials at CRL Pinkenba (aka Unimin Mineral Sands Division)?

Regards,  
Kelley

**Kelley Prowse**

**Department of Environment and Resource Management**

T: 3896 3762 | F: 3406 2578 | Email: [Kelley.Prowse@derm.qld.gov.au](mailto:Kelley.Prowse@derm.qld.gov.au) |

**From:** Stephen Carter [[mailto:Stephen\\_Carter@health.qld.gov.au](mailto:Stephen_Carter@health.qld.gov.au)]

**Sent:** Tuesday, 25 May 2010 4:14 PM

**To:** Kelley Prowse

**Subject:** CRL Pinkenba licence

Hi Kelley

Your email about CRL dust monitoring conditions was forwarded to me for response.

I will need to read the CRL Radiation Safety & Protection Plan to update myself on the requirements in it. Most of them will be related to occupational protection.

With regard to environmental protection I am thinking that the disposal requirements in the Radiation Safety Act & Regulation may be sufficient.

I will be away for the rest of the week, but will get back to you next week with some more details.

regards

Stephen Carter

Stephen Carter

Senior Radiation Health Adviser  
Radiation Health Unit

Environmental Health Branch

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15 Butterfield Street  
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