Community Information Session
Army Aviation Centre Oakey
Preliminary Ecological Risk Assessment

9 November 2016
Acknowledgment of country

We would like to respectfully acknowledge the Jarowair and Giabul, the traditional custodians of the land on which this meeting takes place, and also pay respect to Elders both past and present.
Welcome

Session outline:

• Background
• Overview of Oakey Environmental Investigation
• Preliminary Ecological Risk Assessment
• Next steps
What are PFAS?

Per- and poly-fluoroalkyl substances (PFAS)

- Emerging contaminants

- PFAS have been widely used around the world in coatings (including food packaging) and products that resist: heat, oil, stains, grease and water

- Most people in developed countries are likely to have levels of PFOS and PFOA in their blood
Overview of Environmental Investigation
Current Investigations

Stage 2C - mid-2015 to current

This stage involves:

✓ Environmental Site Assessment – released 27 July 2016
✓ Human Health Risk Assessment – released 5 September 2016

Preliminary Ecological Risk Assessment (ERA)
Preliminary Ecological Risk Assessment
The Investigation Area
Objective of the Preliminary ERA

• To evaluate the potential for adverse effects to the land-based (terrestrial) and water-based (aquatic) plants and animals (ecosystem) within the Investigation Area as a result of exposure to PFAS in the environment

• The findings of the Preliminary ERA will be used to identify the key aspects of the terrestrial and aquatic ecosystem within the Investigation Area requiring further targeted assessment
What **can** the Preliminary ERA tell us?

• Potential for adverse effects on terrestrial (land-based) and aquatic (water-based) wildlife species that live within the Investigation Area

• The potential for adverse effects to occur as a result of direct exposure (e.g. ingesting impacted surface water)

• The potential for adverse effects to occur in wildlife due to bioaccumulation of PFAS in food sources
Potential Outcomes

- Low and acceptable
- Approaching a potential risk
- Elevated

The phrase ‘low and acceptable’ which appears throughout the report is standard terminology used in ecological risk assessments completed consistent with the National Environment Protection Measure (NEPM). This phrase refers to circumstances where the level of risk is calculated to be below the threshold where possible adverse impacts may occur.
What *can’t* the Preliminary ERA tell us?

- Potential for adverse effects on domestic animals, including livestock
- Potential impacts on every type of animal in the Investigation Area
- The specific nature of any potential adverse effects in wildlife, e.g. general health or reproductive issues
Data used in the Preliminary ERA

• Environment Protection and Biodiversity Conservation (EPBC) Act Protected Matters Search Tool identified ecological matters of national significance within a 5km radius of Site:
  – Three threatened fauna species identified within the Investigation Area including the Long-legged Worm-Skink, Red Goshawk and Koala

• Results of the preliminary ecological assessment completed by AECOM in 2015:
  – Regional ecosystems mapped by the Queensland Herbarium
  – Field mapping of:
    • essential habitat
    • areas of ecological significance
    • species-specific habitats
    • waterways

• Surface water, soil, sediment and biota test results from the ESA and HHRA

• Local Oakey Creek Ecological Investigations (AECOM 2015 and DEEPI 2008)
Data used in the Preliminary ERA

- Data from the ESA and HHRA, including 900+ samples collected on and off-site including:
  - Groundwater (422)
  - Surface water (78)
  - Soil (212)
  - Sediment (104)
  - Pore Water (10)
  - Pasture plants (55)
  - Fruit & vegetables (52)
  - Chicken eggs (15)
  - Locally caught fish (46)
  - Rabbits (6)
What did the Preliminary ERA involve?

- **Review of data** collected during the ESA and HHRA and the findings of **ecological field surveys** conducted on, and surrounding, the site.

- Identification of **ecological receptor species**, which are terrestrial or aquatic animals inhabiting environments in the Investigation Area.

- Selection of **indicator species**, which are animal species considered to be representative of a larger group of species with similar food and habitat requirements.

- **Determination of the main pathways** through which indicator species may be exposed to PFAS.

- **Assessment of potential risks** to indicator species.
## Indicator species

<table>
<thead>
<tr>
<th>Type of animal species</th>
<th>Indicator species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land-based animals (terrestrial)</td>
<td></td>
</tr>
<tr>
<td>Mammals that eat plants (herbivorous) and animals (carnivorous)</td>
<td>Eastern Grey Kangaroo</td>
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<td>Northern Quoll</td>
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<tr>
<td>Birds that eat plants (herbivorous). This group also includes semi-aquatic birds.</td>
<td>Painted Honeyeater</td>
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<td>Australian Wood Duck</td>
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<td>Squatter Pigeon</td>
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<tr>
<td>Birds that eat insects (inertivorous), or plants and animals (omnivorous)</td>
<td>Yellow-rumped Thornbill</td>
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<td></td>
<td>Masked Lapwing</td>
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<td></td>
<td>Straw-necked Ibis</td>
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<td>Noisy Minor</td>
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<td>Noisy Friarbird</td>
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<tr>
<td>Reptiles that eat insects (inertivorous), or plants and animals (omnivorous)</td>
<td>Collared Delma</td>
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<tr>
<td>Predatory reptiles</td>
<td>Red-bellied Black Snake</td>
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<tr>
<td>Predatory birds</td>
<td>Black-shouldereded Kite</td>
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<tr>
<td>Water-based animals (aquatic)</td>
<td></td>
</tr>
<tr>
<td>Birds that eat insects (inertivorous), or plants and animals (omnivorous)</td>
<td>White-faced Heron</td>
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<tr>
<td></td>
<td>Australian White Ibis</td>
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<tr>
<td>Birds that eat fish (piscivorous).</td>
<td>Australasian Darter</td>
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<tr>
<td></td>
<td>Great Egret</td>
</tr>
<tr>
<td>Reptiles that eat insects (inertivorous), or plants and animals (omnivorous)</td>
<td>Eastern Water Dragon</td>
</tr>
</tbody>
</table>
How was potential risk assessed?

**Direct exposure** was assessed for animals exposed to PFAS through incidental ingestion of soil, and sediment, incidental ingestion of surface water, and through comparison with screening criteria.

**Dietary exposures via bioaccumulation of PFAS in food sources** were assessed for indicative species from each of the 10 broad species categories.
Quaternary Consumers

Tertiary Predatory Birds
- Red Goshawk

Risks to quaternary predators (consumers) have not been assessed at this stage.

Predatory Mammals
- Northern Quoll

Predatory Birds
- Black Shouldered Kite

Predatory Reptiles
- Red-bellied Black Snake

Invertivorous/ Omnivorous Birds
- Masked Lapwing

Invertivorous / Omnivorous Reptiles
- Collared Delma

Herbivorous Mammals
- Eastern Grey Kangaroo

Herbivorous Birds
- Australian Wood Duck

Terrestrial Invertebrates
- Earthworms

Terrestrial Plants
- Polar Box Tree

Primary Producers

Secondary Consumers

Findings

Direct Exposure

Risks associated with exposure to soil for plants and animals within the Investigation Area are *low and acceptable*.

Risks associated with exposure to sediment, surface water and pore water, at the reported concentrations, have the *potential to pose an unacceptable risk* to aquatic animals and plants.
Findings

Dietary Exposures

Risks to plant eating birds and mammals in off-site areas of the Investigation Area are low and acceptable.

Risks to insect, plant and mammal (e.g. mice) eating reptiles were considered to be low and acceptable.

Risks to predatory terrestrial mammals and reptiles are considered to be low and acceptable.
Findings

Dietary Intakes

*Potential unacceptable risk* to birds which eat terrestrial invertebrates (e.g. insects, earthworms) and birds that eat fish and other aquatic organisms from within the Investigation Area

*Potential unacceptable risk* to predatory birds which eat terrestrial herbivores (specifically rabbits and other small herbivorous mammals) from within the Investigation Area
Next Steps
Preliminary ERA data gaps

- This is the first step in understanding potential ecological impacts from PFAS detected within the Investigation Area.

- Defence is working with Commonwealth and State Government Agencies to identify assessment or management options in relation to potential impacts to domestic animals from PFAS exposure.

- Defence is using the findings of this Preliminary ERA to provide a conservative estimate of potential exposure and assist in understanding where further assessment may be required.
Voluntary Blood Testing

- The Australian Government has committed to funding a voluntary blood testing program for people who live or work in the Investigation Area (now or in the past).

- Defence is working with Government to finalise the arrangements for implementing this program as soon as possible.

- As an interim measure, Defence will reimburse those who live or work, or have lived or worked, in the investigation area who have already obtained PFAS blood tests.

- Fact sheets with additional details are available.
Long and Short-term Management

• Short-term management actions:
  – groundwater remediation trials
  – excavation and stockpiling of sediment from drains on base
  – removal of a large AFFF waste water tank at the base

• Ongoing trials to identify feasible long-term management options:
  – Solidification
  – Stabilisation

• Continue to assess international remediation capabilities
Ongoing Commitments

- Address **data gaps** identified by the ESA, HHRA and Preliminary ERA:
  - Sampling and monitoring of Groundwater Zone 2
  - Consideration of pending FSANZ reference values
  - Human consumption of eggs from backyard chickens
  - Livestock
  - Effect of irrigation return and flooding on migration of PFAS
  - Development of an ongoing monitoring plan

- Regular **residential water sampling**

- Regular **community engagement** – Defence Community Liaison officers and Department of Human Services

- Ongoing **alternative water supply** measures

- Continued liaison and collaboration with **Queensland and Local Government**

- Ongoing liaison with **industry and regulatory** professionals nationally and internationally
Where can you find a copy of the Preliminary ERA Report?

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Hard copies available for viewing:

- Oakey Library
  62 Campbell St, Oakey

- Toowoomba City Library
  155 Herries St, Toowoomba
Questions
Thank you

Contact us

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