



Fauna Egress Matting and Ramps

Environmental Notes on Mining, updated March 2012

What are fauna egress matting and ramps?

Fauna egress matting and ramps are put in place to allow trapped wildlife to escape from HDPE (High Density Poly Ethylene) lined ponds which are commonly used on mine sites (process water ponds, turkey's nests, evaporation ponds, sedimentation ponds are examples).



Why is it required?

The majority of mine sites in Western Australia occur in a dry environment and water sources on mine sites tend to attract animals. Steep sided and wet slippery pond walls make it difficult for trapped animals to escape from ponds resulting in unnecessary impact on fauna. In their attempt to escape animals can also damage the pond liner and associated infrastructure (Plate 2). Dead animals can also result in the blocking of pump inlets/outlets (e.g. Solar salt operations).



Plate 2: damaged liner from fauna attempting to climb the pond wall.

How to minimise the problem?

Earth lined structures are the safest for animals to access water. If a liner is required it may be feasible to have sections of the ponds lined with earth and/or at a lesser angle to allow for safer ingress and egress from the pond.

Batter angles of 30-35 degrees from the horizontal are recommended for ponds.

In some instances ponds may be fenced and/or netted to exclude some or most wildlife. (Plates 3: bird netting and fence with shade cloth, Plate 4: electric fencing and rigid overhang to deter small wildlife from entering a salt water flume). If large animals are deterred by suitable fencing the egress mat only needs to be suitable for smaller sized fauna (e.g. snakes, lizards, small mammals).



Plate 3: HDPE pond netted and fenced to exclude wildlife (Fortescue Metals Group, Cloudbreak).



Plate 4: Water flume, electric fence and overhang to deter fauna, (Shark Bay Salt JV).



What works?

Feedback from various WA mine sites, consultants and DMP Inspectors indicates that the following options seem to perform the best:

1. Earth/rock ramps
2. Large diameter rope (for small mammals/reptiles)
3. Large weave shade cloth weighed down and reinforced with conveyor belt matting and anchored securely with metal bar and chain at top end to avoid twisting. Needs anchoring at lower end as well.
4. Wooden pallets linked together
5. Used tires linked together
6. Cyclone mesh fencing weighed down and anchored securely. For example tied securely to conveyor belt matting using “C” cleats and tek screw or plastic zip cable ties (refer to front cover picture and plate 5).
7. Logs or large planks of wood.



Plate 5: Example of successful fauna egress using conveyor matting and a mesh stripe which is firmly secured to the matting with cable ties (BC Iron Nullagine Pty Ltd).



Various materials that have been tried and pro and cons are listed in table 1:

Material used	Pros	Cons
Shade cloth weighed down with used conveyor belt matting, metal chain/bar as spreader at top. Anchored at the bottom of pool.	Relatively cheap, conveyor matting usually available on sites, use of waste material for conveyor matting.	Needs maintenance and good anchoring and bracing to avoid twisting.
Concrete reinforcing mesh, weld mesh, cyclone type fencing.	Strong enough to support large animals. Proven to be effective at a Pilbara mine site.	Expensive, may tear the liner. Can be lined with shade cloth or attached to wooden planks or conveyor belt matting to avoid that issue. Heavy. Can rust depending on mesh used.
Linked used tyres	Readily available on sites, use of waste material.	May not work for smaller fauna, heavy, requires strong anchoring points.
Jute matting & Geotextile matting.	Cheap, lightweight, can come in long lengths.	Limited lifespan for natural based product. Some types are reinforced with synthetic fibres which become a trap for bird feet/small animals. Not strong enough to support large animals. Needs anchoring at the base to stop bottom section floating in the pond.
Linked used wooden pallets	Readily available on sites, use of waste material.	May tear the liner, need strong anchoring points, heavy.
Large diameter rope.	Effective to allow small fauna egress from ponds (e.g. reptiles, small mammals)	Not useful for larger fauna. Limited lifespan for natural product derived ropes. Needs anchoring at the base to stop bottom section floating in the pond.
Wooden planks, logs	Effective.	Logs not readily available in the arid zone, may damage the liner. Heavy.
Netlon™ mesh products (4-25mm mesh sizes) used in aquaculture related products	Can be welded to HDPE, lightweight.	Not strong enough to support large animals.
Linked used rock core sample trays	Lightweight. Can be weighed down with core samples	Expensive, site geologist may object.



Other considerations

Use of contrasting colours

White is used in commercial products designed for the emergency egress of pets from swimming pools because all animals can see that colour. What is the trapped animal likely to see at the pond's water level? Consider using a colour that contrasts against the black colour of the HDPE lining.

Floating pontoons

Pontoons may be of use for birds to recover and avoid predators by flying out rather than climbing out of the pond.

Placement of the mat or ramps

In general the corners of ponds provide the lowest angled slopes, tend to act as a funnel to direct trapped wildlife and are the best locations to provide egress matting.

For large ponds additional mats should be placed at regular intervals between corner locations.

Length of egress mat or ramp

The egress mat or ramp needs to allow for varying water levels in ponds. The mat should be placed below the water and extended past the liner at the top of the pond or dam.

Anchoring

The mat should be anchored at the bottom as well as the top as it can become twisted by wave/wind action and become ineffective. Sand bags are a good option to anchor structures at the base of the pond without compromising the liner integrity.

Maintenance

Fauna egress points are often provided for ponds where the water quality maybe affected by chemicals (cyanide/salt/ hydrocarbons) and where possible the management of the water quality in those ponds to reduce the impacts to wildlife from chemicals should be a primary consideration.

Any egress ramps require regular checks and maintenance to ensure that it is performing its function. Fine mesh such as shade cloth or Netlon™ mesh can become slippery with the buildup of sediment/oils and needs to be cleaned or replaced from time to time. All products deteriorate due to sunlight (e.g. zip ties, plastic mesh) and from being immersed. The use of galvanized or stainless steel fittings/mesh reduces the maintenance requirements.

The anchor points also need to be checked regularly. Examples of designs that have been shown to be effective are shown in Plates 6 and 7.



Plate 6: Dingo using egress matting, (Telfer, Newcrest Mining Ltd).



Plate 7: Shade cloth fixed to conveyor belt matting (Telfer, Newcrest Mining Ltd).

Feedback:

Any feedback on fauna egress matting would be appreciated. The DMP Environmental Inspectors see many egress designs, but gauging the effectiveness is difficult to assess. We rely on constructive feedback to update or improve the above information.

Feedback to phil.boglio@dmp.wa.gov.au



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