

Use of Above-Ground Sumps for Air Drilling

Capturing and managing the water and mud discharged from cyclones and outside return hoses during air drilling is particularly important when drilling in sensitive areas. Capturing the water and mud greatly reduces the visual impact of drilling, wetting of the ground around the rig and subsequent disturbance, rehabilitation time and cost. These measures can make drilling safer, cause less surface disturbance and are more acceptable to landholders.

Background

One of the prospects where Cortona Resources Limited conducted reverse circulation (RC) drilling was on prime grazing land. The landholder had invested considerable time and money to grow high quality pasture for his stock and the last thing he wanted was damage caused by exploration. Planning of the drilling program also anticipated intersecting water in the holes. The program had to be managed to minimise the impact of the water, contained rock fragments and mud on the pasture, as well as generation of mud around the rig. The company therefore needed to undertake the drilling program with minimal disturbance in this difficult and sensitive area.

The Solution

One of the measures to minimise surface disturbance was to capture the water discharged from the cyclone and outside return hoses in an above-ground sump. As well as minimising disturbance, by containing the water the drill site stayed drier, more comfortable and safer.

The other measure integral to this was the use of a dust suppression system to capture both the sample and outside return material. The dust suppressor had a bin beneath the cyclones to capture the water and drain it into the above ground sumps.

Above-Ground Sump

Above-ground sumps have been used by a number of companies over the years. Sumps are generally made by forming a dam of hay bales and lining with plastic. During the recent drought this method was not appropriate and the hay bales could only be used a couple of times before they fell apart. A more durable solution was needed. A collapsible frame of 'form ply' was made, which could be used over and

over again. This frame was cheap and easy to make, easily handled by one person, portable and allowed for quick clean-up following completion of the hole.

The above-ground drill sump system comprised the following components:

- Four 20mm thick plywood side panels approximately 600mm high (sheet of 'form-ply' cut in half lengthwise)
- The side panels are joined at each corner with detachable fittings or hinges. Two methods of joining the panels are:
 - Each panel can be fitted with four steel rings at the end of sufficient diameter to allow a star picket to be passed through or
 - Heavy duty gate hinges which can come apart on 2 corners and lever over latches on the other 2 corners (Cortona System - see photos below)



Form-ply sump showing hinges



Form-ply sump showing latches

- Notches of sufficient size to accommodate 150mm PVC pipe were cut into the top edge of the end panels
- Rolls of plastic of sufficient width to allow the sump to be lined
- A cable drive pump or syphon.

The sumps were assembled by joining the edges of two panels, passing a star picket through all four steel rings and driving it into the ground or inserting pins in hinges and securing latches. This process was repeated to form a rectangular sump. The sump was then lined using plastic and the edges of the plastic held in place with clamps as required. The overflow pipe from the dust suppression unit or cyclone and outside return hose were then directed into the sump. The outside return hose was required to be restrained to prevent injury in the event of sudden movement.

Once the sump was full or near to capacity and the water was sufficiently clear, it could be pumped or syphoned away from the work area and discharged. In Cortona's case the water could be syphoned away down slope of the drill site. Every situation is different, but only clean water may be discharged onto the ground.

If the volume of water intersected required greater settling time than could be achieved using a single sump, a second (or more) sump(s) could be setup in series.

Once the drill hole was complete, the sump was emptied of water and the sides removed. The remaining sediment was then left to dry, bagged and removed from site. The plastic liner may be reused if undamaged, otherwise disposed of appropriately. The plastic liner was only left on the ground for a couple of days to reduce damage to the grass underneath. If the sediment was not dry it was bagged up wet or disposed of back down the drill hole.

Containing the water in the sumps greatly reduced the wetting of the ground around the rig, disturbance to the ground by drillers walking in mud, visual scarring from rock fragment laden water flowing over the ground and overall drill pad rehabilitation times.

At the completion of the program, the landholder was happy with the minimal amount of disturbance to his pasture, which was a positive outcome for both parties.



Sump set up at rig. Dust suppressor captures both sample and outside return in separate cyclones. Water is captured in bin beneath cyclones and drained into sump



Drill site on completion of hole showing minimal impact and sump liner drying out

Disclaimer: This fact sheet is intended to provide summary information only. It does not intend to be comprehensive or to provide specific legal advice. Given the changing nature of legislation, regulations, program rules and guidelines, there is a potential for inherent inaccuracies and potential omissions in information contained in this fact sheet. All information in this fact sheet is provided "as is" with no guarantee of completeness or accuracy and without warranty of any kind, express or implied. In no event will New South Wales Minerals Council Limited, any related members, consultants or employees thereof be liable to anyone for any decision made or action taken in reliance on the information in this paper or for any consequential damages.