Oil Spill Response

Oil Spills in Wadis: Access, risk assessments and clean up Technique

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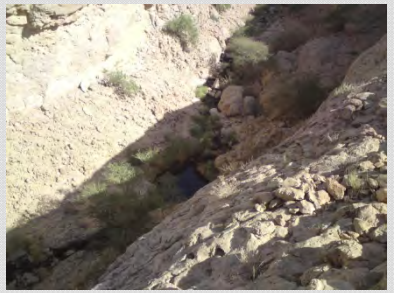
A Timeline of Yemen Incidents

02nd June	04th June	06th June	30th June	26th July	28th July	11th Aug	20th Aug	24th Aug	01st Sept	13th Sept
Yemen 1 incident	Mobilised	On site	Begin pipeline spill assistance	Sites Wadi Bin Ali and Wadi Dema'a complete	Sites Wadi Gariba'a and Shibam complete	Demob	Yemen 2 incident	Technical Advisor mobilised	Response mobilised	Demob

Initial Summary

- On the 24th August 2008 Oil Spill Response were asked to mobilise a technical advisor to Yemen.
  - Unknown quantity of oil spilt in two separate locations.
  - Believed to be a mixture of used engine oil, water and sludge.
  - Requested to send a Technical advisor with previous experience of Yemen.
  - 1 Technical advisor sent out free of charge for the first 24hrs

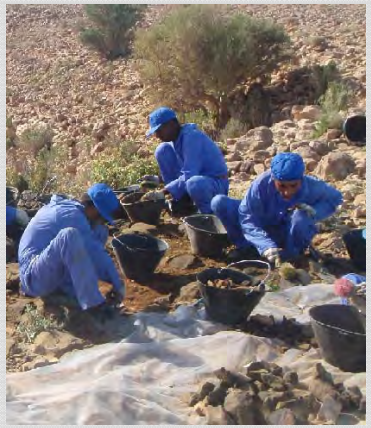


Mukalla checkpoint initial Assessment

- **Background**
  - Moderately-lightly oiled for a distance of 200-300m (35% coverage) with stranded oil on substrate and flora.
  - Spillage of used engine oil, water and sludge
- **Situation**
  - From the pumping point at the top of the Wadi oiling extended with a covering of stranded oil on rocks and light oiling in vegetation. The covering was of approx.1-2mm of oil lies over sediment.
  - Estimated oil quantities worst case scenario 2700l

Mukalla checkpoint response

- **Remedy**
  - A manual skimming was implemented to remove the top 1-2mm of sediment.
  - Rocks were placed to one side and were scrubbed using clean sand as an abrasive.
  - Oiled sediment was collected in plastic bags before being taken to the clients waste handling site.
- Work was estimated to take 2-3 weeks to clean.



Mukalla checkpoint response

- **Requirements**
  - 70 personnel to clean site
  - Transport of personnel to/from site and food and drink during period prior and post Ramadan
  - 2000 Plastic bags
  - Assortment of 70 shovels and trowels
  - Assortment of 70 brushes
  - 1 x temporary shelter
  - 6 x Tarpaulin

Ramadan

- Work was estimated to take 2-3 weeks to clean due to the limited working hours and slower pace of work that occurs during the month of Ramadan.
- Measures taken to improve conditions
  - Increased personnel
  - Fixed temporary shelter
  - Movable shelters to provide shade
  - Reduced working hours

Wadi Mukalla Initial assessment

- **Background**
  - The Wadi closest to the contractors camp, moderately oiled (25%-30% coverage) over a distance of 400m with free floating oil in ponds and on substrate.
  - Oil was initially pumped into a 1m^3 concrete bund which has a pipe leading to the Wadi.





Wadi Mukalla Initial assessment

- **Situation**
  - Oiling extended between the concrete bund and the Wadi top with 4-5inch hose. From the Wadi top oiling extends down the Wadi with stranded oil on rocks and in vegetation. The majority of the oil is stranded in a large pool towards the top of the Wadi which is to be designated the critical area. However the Wadi had also received pumping of black water (sewage) which is made the extent of the oiling unclear.
  - Samples were taken from the following three locations
    - Location 1 – Large pool (critical area)
    - Location 2 – Intermediate pool 2
    - Location 3 – Intermediate pool 4
- These samples were given to client for analysis to determine the extent of the oiling, as the client and oil ministry representatives were happy to leave the black water untouched.
- Estimated oil quantity worst case scenario 2000 litres





Wadi Mukalla Sample results

- Large pool
  - Muddy black colour dirty liquid.
  - Contains oil, sludge and sand.
  - Approximately 2% oil

- Intermediate pool 2
  - Muddy liquid containing little amounts of oil residue resent with sand
  - Approximately 0.7-1.3% oil

- Intermediate pool 4
  - Off white colour muddy
  - Contains Hydrocarbon traces with little amount of sand
  - Approximately 0.3-0.5% oil

Access Issues

- Difficult access to Wadi Mukalla resulted in the site being closed to operations.
- Moderate-difficult access to upper portions of the Wadi
- Access to lower portions of Wadi Extremely difficult – impossible with out ladders, scaffolding or climbing equipment.
- No alternative exit routes for lower portions of the Wadi

Access Issues

- Main access for Wadi Mukalla. Picture shows rock steps and right hand turn to traverse.

Access Issues

- Main access for Wadi Mukalla. Picture shows View of traverse.

Access Issues

- Main access for Wadi Mukalla. Picture shows Traverse with descent.

Access Issues

- View back at the main access for Wadi Mukalla

Access Issues

- Access to Proposed ladder position

- View down proposed ladder site.

Access Issues

- Possible Emergency exit routes

Risk Assessment

- Task
  - Entrance/exit to the upper portions of the Wadi.
- Details
  - The entrance to the upper portions of the Wadi consists of a small descent of 1meter on natural rock steps before a 20m traverse.
  - The traverse is made across a 3m wide path with a gentle gradient towards the Wadi floor.
  - After the traverse there is a 180° turn before another traverse. This is down a gradient of approximately 40°-45° with a 0.5m wide path.
  - Finally a small 1m descent of rock steps to the Wadi floor. There are minimal opportunities for hand holds.

Risk Assessment

- Hazards
  - Slips, trips and falls.
- Severity
  - A fall would likely result in anything from a broken bone and some heavy bruising to severe injury and death in a worst case scenario.
- Probability
  - Taking into account the quantity of personnel using this path, the frequency of use and the possible duration of the spill probability of this occurring without sufficient control measures put in place would be occasional but infrequent occurrence.

Risk Assessment

- Task
  - Entrance/exit to the lower portion of the Wadi.

- Details
  - Entrance to the lower portion of the Wadi is to be made from the Wadi floor of the upper section. From this area personnel will descend a 3-4 meter vertical face via ladder to gain access to the lower portions of the Wadi.

- Hazards
  - Slips, trips and falls.

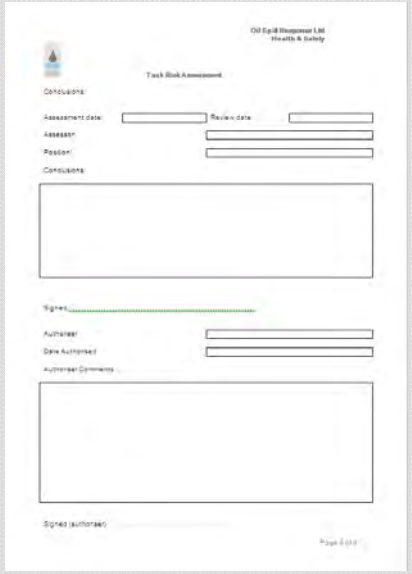
Risk Assessment

- Severity
  - A fall would likely result in anything from a broken bone and some heavy bruising to severe injury and permanent disability.

- Probability
  - Taking into account the quantity of personnel using this path, the frequency of use and the possible duration of the spill probability of this occurring without sufficient control measures put in place would be remotely possible with known occurrences.

Risk Assessment

- Task
  - Emergency exit from wadi in event of flash flood.
- Details
  - In the event of heavy rain the wadi is prone to flash flooding.
- Hazards
  - Becoming stranded by the water. Drowning.
- Severity
  - A flash flood would likely result in washing several personnel down the wadi resulting in similar injuries to a severe slip, trip, fall and in the worst case scenario may result in drowning.
- Probability
  - Remotely possible with unknown occurrences.



Risk Assessment

- Task
  - Exit using emergency escape route
- Details
  - Exit using emergency escape route. A secondary means of escape is to be rigged in position N15°41’17.5’’, E048°48’07.9’’. This rope is to be secured by professionals due to its height (Spanning approx. 60m). However this means of exit is very high risk and is only to be used in the event of an emergency.
- Hazards
  - Slip, trip and/or fall.
- Severity
  - A fall from this means of exit would almost certainly result in a major injury and in the worst case scenario death.
- Probability
  - Remotely possible with unknown circumstances.

Conclusion

- A successful response
  - Site was completed ahead of schedule
  - No accidents or injuries occurred
- Highlighted the importance of risk assessment
  - Avoids commercial/political pressure to respond in any circumstance
  - Covers legal responsibility of duty of care
- Good learning experience
  - Allowed for development of strategies for inland response
  - Allowed exposure of dealing with strong cultural issues on a spill site
- Highlighted the importance of local knowledge

Oil Spill Response

Any Questions?