

From: Carole McRae
Sent: 31 August 2022 09:42
To: Maria Rossi [REDACTED]@phs.scot>; [REDACTED] (NHS Highland) <[REDACTED]>; phs eph <phs.eph@phs.scot>
Cc: [REDACTED]@phs.scot>; [REDACTED]@phs.scot>; [REDACTED]@phs.scot>; [REDACTED]@phs.scot>; [REDACTED]@phs.scot>
Subject: RE: For information - follow up re H2S release from a submerged fish feed barge

Thanks for the really useful update, [REDACTED]

C

Dr Carole McRae | Consultant Healthcare Scientist (Environmental Public Health)

Pronouns: She/her/hers

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From: Maria Rossi <[REDACTED]@phs.scot>
Sent: 30 August 2022 13:09
To: [REDACTED] (NHS Highland) <[REDACTED]>; Carole McRae [REDACTED]@phs.scot>; phs eph <phs.eph@phs.scot>
Cc: [REDACTED]@phs.scot>; [REDACTED]@phs.scot>; [REDACTED]@phs.scot>
Subject: RE: For information - follow up re H2S release from a submerged fish feed barge

Thanks for the useful update, [REDACTED]

Carole is back tomorrow, I believe.

maria

Dr Maria K Rossi
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From: [REDACTED] (NHS Highland) <[REDACTED]>
Sent: 30 August 2022 12:03
To: Maria Rossi [REDACTED]@phs.scot>; Carole McRae <[REDACTED]@phs.scot>; phs eph <phs.eph@phs.scot>
Cc: [REDACTED]@phs.scot>; [REDACTED]@phs.scot>; [REDACTED]@phs.scot>
Subject: For information - follow up re H2S release from a submerged fish feed barge

Dear Maria and colleagues,

Hope that this finds you well. As detailed on Friday, please find below a written summary of the current situation involving the barge. This situation is now being led by Police Scotland under our emergency response processes. Unfortunately, there has been a delay which has arisen due to the contractor pulling out of the contract. This was due to the company (Briggs Marine) being unable to secure the dispensation to hold nitrogen on their vessel. However, colleagues in Scottish Salmon (now Bakkafrost) have been working through their contingency plans to secure a new salvage contractor and to ensure that all mitigations remain in place.

Current situation:

There has been no change in the current situation and no worsening of the gas bubbles that are being released from the casualty holding the silos. Ten continuous gas monitors have been set up in the local area. These provide 24/7 continuous readings for H₂S and are remotely monitored. They are sited around the casualty itself, some on land and some in offshore locations at a distance from the casualty. The monitor located above the casualty at the site itself has identified H₂S at 2ppm but all other monitors have been 0ppm. Two water samples have been taken but we have not had the results of these as of yet. The marine guard vessel remains in place to monitor the exclusion zone around the casualty.

Venting process:

There is considerable work underway to plan for the venting process itself. The plan is to attach hosing up to the silos and then run this to a nearby pen with a surrounding boom north of the casualty. The boom is in place in case of any discharge of oils. Good progress was being made with respect to the hosing but this is now on hold during the transition to the new salvage operator. With respect to the nitrogen storage issue, the Bakkanes vessel which is owned by the company (Bakkafrost) already has dispensation for nitrogen and this is being brought over to support the process. This is a self-sufficient vessel with accommodation for the divers and also medical facilities. At present, it is hoped that the work to prepare for the salvage operation will be completed early next week to allow the venting of the H₂S to proceed.

With respect to the venting process itself, this will only commence when the weather is favourable and the wind direction will be blowing the vented gas offshore and away from any receptors. If there were to be a change in wind direction, the venting process would be stopped. The continuous gas monitors are managed remotely and would also provide an early warning of any potential issue.

From an emergency response perspective, planning has been carried out for the unlikely event of an uncontrolled catastrophic release. The casualty itself is made from concrete rebar and it would take a very significant event to break this. An ELG would be set up to agree the response and to communicate any stay indoors message to the public as required. The sectors have been calculated and shared by Police Scotland to identify the relevant receptors albeit this is small.

Modelling has been undertaken by Vanderpers Maritime. A number of scenarios were modelled ranging from a simultaneous collapse and uncontrolled gas release of 100% capacity to a routine operating scenario whereby there is purging with nitrogen. We had some concerns regarding the potential H₂S concentrations modelled for some of the worst case

I copy in for information a number of colleagues as we cross-cover each other over this period.

maria

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From: [REDACTED] (NHS Highland) <[REDACTED]>
Sent: 16 August 2022 15:03
To: Maria Rossi <[REDACTED]@phs.scot>; Carole McRae <[REDACTED]@phs.scot>
Subject: For information - follow up re H2S release from a submerged fish feed barge

Dear Maria and Carole,

Re: Situation involving hydrogen sulphide release from a submerged fish feed barge off Portree

Hope that this finds you well. As highlighted at the WNHP meeting, please find below a summary of the situation for information.

We were notified yesterday regarding the identification of hydrogen sulphide gas release from a silo onboard a sunken fish feed barge at a fish farm near Portree. Although we were only notified yesterday, the situation involving the barge is longstanding albeit we understand that the gas release was first noticed last week.

The barge sank at the end of November 2021 and plans have been made to recover the barge. The silos were sealed at the time to prevent any leakage. As part of the planning for the barge recovery work, it was noted that there were bubbles arising from one of the feed silos. This has been confirmed as hydrogen sulphide.

I have been keen to separate our assessment into two aspects, the current health risks posed by the release at the current time and then the subsequent risks once the venting process to release the gas commences.

Current situation and associated health risks:

The submerged silo is around 500m from the shore line located north east of Portree and approximately 30m deep. The H₂S readings are highest in the silo at 55,000 ppm with levels of 2 ppm at the site itself. I understand that this level of 2 ppm was a reading above the submerged silo in the open air but have sought clarification on this. We have not received any written documentation as of yet. There has been no detectable hydrogen sulphide more widely than this and as such the air quality guideline (0.15mg/m³ with an averaging time of 24 hours and 7micrograms/m³ with a 30 minute averaging period) would be met onshore and also for passing boats etc. As such, there would be no inhalation risk to those using the coastal path (more than 500m away) and those on passing boats. It is my understanding that hydrogen sulphide dissipates in air and is dispersed by wind. I believe this is usually within one to three days in the Summer although this can be extensive in the Winter. As you kindly

highlighted in the meeting, the odour threshold is extremely low and we are not aware of any concerns being raised.

Given the location of the site, and the site exclusion zone of 500m, I do not believe that the public would be using this water for recreational activities and as such there is no chance of dermal contact or ingestion but we are seeking clarification on this and whether there have been any readings from the water around the site. With respect to the water itself, my understanding is that hydrogen sulphide has a half-life of around one to two hours in these environments.

We have also asked to see the risk assessments from an OH perspective and the mitigations in place for the team working on this.

Out with toxicity concerns, I understand that there is not considered to be an explosive risk from an intact barge as the silos are deemed inert as they are sealed and the oxygen levels are very low. The current perimeter has been designated as 500m though and there has been a request from the Port Authority for a guard vessel to police the perimeter.

I understand that there could be an explosive risk in the extremely unlikely event that the barge were to break up though. My understanding from yesterday was that a 2km perimeter would be advised in this context. However, this is viewed as incredibly unlikely and as such not proportionate to implement such as exclusion zone in the current context.

There was considerable concern from local stakeholders re the situation and one of my key concerns was the need to manage the risk communication and to be clear regarding the health risks. There was considerable discussion around the path closure and whilst I do not feel this is necessary from a health perspective, the wider group were supportive of the path closure. As such, I was keen to advise that the rationale for this is clear and that the path is not being closed because of acute health risks given there is no detectable hydrogen sulphide and thus no inhalation risk onshore. This could be different during the venting process though but I am keen we see the risk assessments prior to giving any advice re mitigations for that aspect of the process.

Process when works commence:

I understand that there is detailed work being undertaken regarding the risk assessments and we have asked to be sighted on these so that we can assess any potential risks to the public and the resulting mitigations and communications. As such, we have not considered that as of yet and have focussed solely on the potential risks at the current time.

If there is anything else that you would advise, or if you have concerns re our assessment, then we would be very grateful for any thoughts from yourselves please. We will hopefully have more information in due course re the next steps though.

Thanks and best wishes,

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Consultant in Public Health Medicine (Health Protection)

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If you have a query relating to contact tracing, please contact NHS Highland's Contact Tracing team on nhsh.covid-19contacttracing@nhs.scot