
MEMORANDUM

TO: VEDANTA ZINC INTERNATIONAL

FROM: STEPHEN WHESTON – TEMBUSU LTD.

SUBJECT: LISHEEN MINE CLOSURE COMPLETION ACHIEVEMENT

DATE: 22-7-21

The purpose of this note is to recognise the achievement of mine closure completion approval for the Lisheen Mine, and to describe the process by which this was achieved.

1. Background

Development of the Lisheen Mine began in 1997, with production commencing in 1999. Over the life of the mine an annual average of 165,000 MT in zinc metal concentrates and 22,000 MT in lead metal in concentrates were produced within the processing plant on the mine site and transported to various smelters across the world from the Port of Cork. Final operations ceased at the end of 2015.

Globally mine closure has been a challenge for the industry and there are many examples around the world of very poor mine closure, where environmental impact continues to be caused long after an operation has ceased. In many instances the mining companies do not plan or provide for mine closure and operate up until the point where the company is no longer making money, or the resource has been depleted. Often the mining company will go bankrupt, with no cash or assets leaving the legacy of the mine site to be managed by the State.

Indeed, in Ireland there are many examples of poor mine closure particularly associated with a number of mines that operated in the latter half of the 20th century and closed with very little, if any, rehabilitation work being completed.

Towards the end of the 20th century and throughout the start of the 21st century the approach to mine closure has changed globally. Standards on mine closure¹ have been produced and ‘mine closure’ has become a specific discipline within the industry with the major mining companies employing experts in this discipline.

It is in the context of the poor mine closure globally and nationally that Lisheen Mine sought it’s permitting in the mid 1990’s and the Regulatory Authorities were careful to ensure that adequate conditions were included in all permits to ensure that mine closure was properly catered for.

¹ Example - ICMM’s Integrated mine closure: good practice guide (2nd Edition 2019)

Prior to achievement of its permits Lisheen Mine was required to demonstrate how the mine would be closed, what the cost of that closure would be, and to put in place financial assurance to meet that closure liability. The financial assurance was initially a combination of cash and financial bonds. The bonds were collateralised over the early years of the mine, so that by the mid 2000's the closure fund was a cash fund held in ESCROW, with signatories of all Regulatory Authorities and Lisheen required to withdraw funds.

Over the years the plan was reviewed and revised following consultations and workshops that considered substantial environmental and geochemical information that developed a closure framework for directing activities towards successful closure of the mine that became the Closure, Restoration and Aftercare Management Plan, the CRAMP.

2. Mine Closure Agreement

The mine closure agreement² is a 21-page document which detailed how funds would be released and how closure work would be validated. This was a complex agreement that took a number of years to complete and agree, with all parties being advised by legal representatives. This Agreement was prepared and agreed by all parties (Regulatory Authorities and Lisheen Mine) and signed in October 2013³.

The Mine Closure Agreement is an important document as it not only detailed how closure works would be cash flowed and validated, but it also described how the mine closure work would be certified as completed.

3. Implementation of the CRAMP at Lisheen.

The mine entered into the Active Closure stage in March of 2014 with the development of the Lisheen Mine Closure Team who ensured that the closure project was executed and that all success criteria were achieved. Although the Active phase of closure commenced in March 2014, the mine was engaged in progressive rehabilitation prior to this time. During 2007 and 2008 a specification for TMF capping and final restoration was developed using a 'Demonstration Cell'. Test data and observations were carried out to assess its performance following establishment, which allowed for the implementation of progressive rehabilitation works to commence in advance of the cessation of mining operations. During the Active Closure quarterly reports were submitted to the Regulatory Authorities to provide evidence of closure works completed. A number of exit audits were completed by the EPA to assess the implementation of the closure works. The Active Closure phase ended in February 2018. After the completion of the Active phase of closure, the mine then entered into a period of Passive Validation to monitor the site and assess the effectiveness of the closure works. It was during this Passive period that Lisheen Mine identified a seepage issue on the southern corner of the TMF and engaged with the Authorities to address this issue, arguably moving the site back into a period of Active closure while this issue was resolved. An extensive period of investigation and remediation took place between late 2018 and early 2020 to identify the source of the seepage and resolve it. As of March 2020, the repair work was complete, and the mine re-entered a Passive closure period.

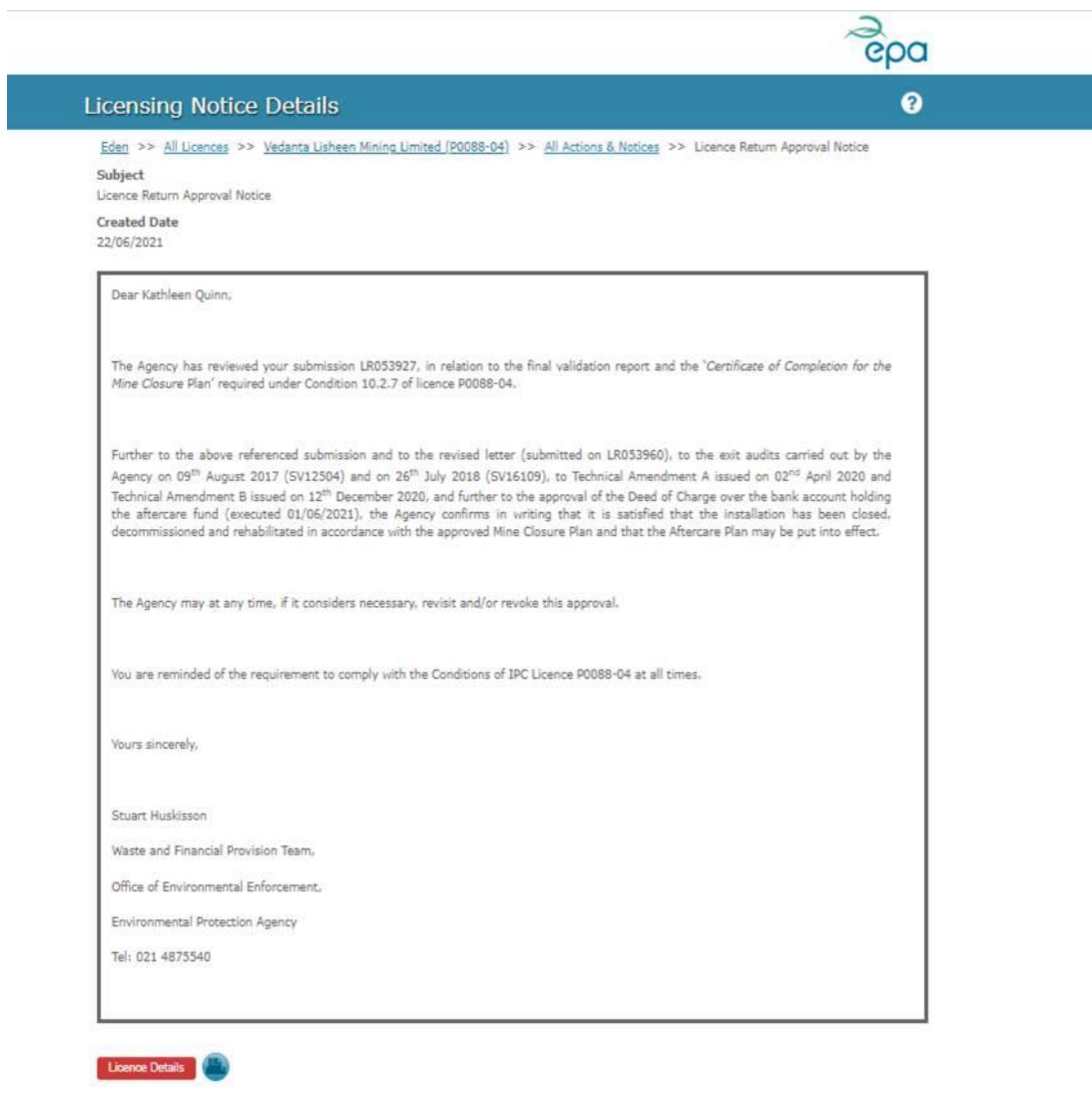
² Mine Closure and Rehabilitation Agreement (October 2013).


³ 17th October as per EPA date stamp.

During this Passive period monitoring took place to ensure that the repair works have resolved the issue successfully and demonstrate this to the Regulatory Authorities.

Throughout 2020 a number of submissions, including the 'Final Validation Report' were made by Lisheen to the Regulatory Authorities and a number of meetings were held. The objective was to provide information which demonstrated that the TMF repair works had been a success and that all other works associated with closure were complete, that baseline conditions had been restored and that success criteria had been achieved. The Final Validation Report contained reference to all submissions that were made to the EPA to demonstrate that the Closure Plan was implemented, this included Construction Quality Assurance reports for all capping works on the TMF, a hydrological review of the rewatering of the mine, and site characterisation reports (to name just three of these submissions).

On the 22nd of June 2021 the EPA wrote to Lisheen to confirm that they were '**satisfied that the installation has been closed, decommissioned and rehabilitated in accordance with the approved Mine Closure Plan and that the Aftercare Plan may be put into effect**'.





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Subject
Licence Return Approval Notice

Created Date
22/06/2021

Dear Kathleen Quinn,

The Agency has reviewed your submission LR053927, in relation to the final validation report and the 'Certificate of Completion for the Mine Closure Plan' required under Condition 10.2.7 of licence P0088-04.


Further to the above referenced submission and to the revised letter (submitted on LR053960), to the exit audits carried out by the Agency on 09th August 2017 (SV12504) and on 26th July 2018 (SV16109), to Technical Amendment A issued on 02nd April 2020 and Technical Amendment B issued on 12th December 2020, and further to the approval of the Deed of Charge over the bank account holding the aftercare fund (executed 01/06/2021), the Agency confirms in writing that it is satisfied that the installation has been closed, decommissioned and rehabilitated in accordance with the approved Mine Closure Plan and that the Aftercare Plan may be put into effect.

The Agency may at any time, if it considers necessary, revisit and/or revoke this approval.

You are reminded of the requirement to comply with the Conditions of IPC Licence P0088-04 at all times.

Yours sincerely,

Stuart Huskisson
Waste and Financial Provision Team,
Office of Environmental Enforcement,
Environmental Protection Agency
Tel: 021 4875540

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The EPA was the lead agency for the Regulatory Authorities and this declaration of satisfaction with the implementation of the Closure Plan is on behalf of all of the Authorities. The receipt of this confirmation has allowed Lisheen to close off other aspects including the State Mining Lease and recovery of funds associated with this lease.

4. Conclusion

The notice of satisfaction from the EPA is a major achievement for Lisheen Mine and Vedanta. The development of the Closure Plan at Lisheen was a significant task and required considerable resources from Lisheen from the late 2000's onwards when preparations for closure were accelerated.

The notice of satisfaction from the EPA was achieved following tremendous efforts by Lisheen employees and business partners of Lisheen from 2007 onwards to develop and implement the Closure Plan. It has been a long journey for all of those that have been involved. As of February 2018, when Active Closure was completed, it had been anticipated that approval of the closure works from the EPA would follow shortly afterwards. However, this was not the case. The delay was certainly influenced by the TMF seepage issue. The mine ceased operations December 2015 and notwithstanding all of the progressive rehabilitation that was completed⁴, it was a further 5 years before the EPA approved the successful execution of the Mine Closure Plan.

There were many learnings during the development and implementation of the Closure Plan. Aside from the engineering challenges that were identified and overcome, the need to 'expect the unexpected' and the need to be 'flexible and adaptable' have proven to be two of the more significant learnings and both were managed very well by Lisheen and Vedanta.

Many aspects of closure planning and implementation at Lisheen may be considered to be best practice for the industry and it is anticipated that Lisheen will be seen as an example of how to successfully operate and close a mine.

The Aftercare Plan will continue to be implemented to demonstrate to the EPA that the site remains stable.

Stephen Wheston MSc.

Tembusu Ltd. - Sustainability & Risk Management.

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⁴ Lisheen achieved its commitment to the community to have the TMF 60% capped by the time mining operations ceased (a voluntary commitment made by the company to the community, i.e. not a licence requirement).