

CASE STUDY

Stowell Mine Shasta County, California

2010

**Prepared by
The Interstate Technology & Regulatory Council
Mining Waste Team**

Permission is granted to refer to or quote from this publication with the customary acknowledgment of the source. The suggested citation for this document is as follows:

ITRC (Interstate Technology & Regulatory Council). 2010. *Stowell Mine, Shasta County, California*. Mining Waste Treatment Technology Selection Web. Washington, D.C.: Interstate Technology & Regulatory Council, Mining Waste Team. www.itrcweb.org.

Acknowledgements

The ITRC Mining Waste Team would like to acknowledge John Andrews from Vestra Resources, Inc., who completed the April 2008 Mine Waste Case Study Survey, from which the information in this case study is taken

TABLE OF CONTENTS

1. SITE INFORMATION 1
 1.1 Contacts..... 1
 1.2 Name, Location, and Description 1
2. REMEDIAL ACTION AND TECHNOLOGIES 1
3. PERFORMANCE..... 1
4. COSTS 2
5. REGULATORY CHALLENGES..... 2
6. STAKEHOLDER CHALLENGES 2
7. OTHER CHALLENGES AND LESSONS LEARNED 2
8. REFERENCES 3

LIST OF TABLES

Table 3-1. Cleanup concentrations 2

STOWELL MINE, SHASTA COUNTY, CALIFORNIA

1. SITE INFORMATION

1.1 Contacts

Vestra Resources, Inc.
John Andrews
Telephone: 530-223-2585
E-mail: jandrews@vestra.com

1.2 Name, Location, and Description

Stowell Mine
Shasta Lake City
Shasta County, California
<http://maps.google.com/maps?q=Stowell+Mine,+Shasta+National+Forest,+Shasta,+California+96001&hl=en&sl=37.0625,-95.677068&ssp=59.467068,79.013672&t=m&geocode=FdktbQIdupGy-A&hnear=Stowell+Mine&z=14>

The Stowell Mine is an abandoned copper mine in massive sulfides. The mining properties were worked between 1890s and 1930s. Three portals have been plugged with concrete seals, but residual flows persist. Site is accessible by dirt road, but very steep terrain makes construction of treatment systems difficult. The site is approximately 100 acres. Discharge of acid mine drainage from portals is 5–10 gpm. Contaminants of concern include copper, cadmium, and zinc.

2. REMEDIAL ACTION AND TECHNOLOGIES

- Full-scale, sulfate-reducing bioreactors are contained in a 2000-gallon high-density polyethylene tank. The treatment effluent is applied to the land.
- Capping/covers/grading: Waste rock is placed in a constructed landfill with impermeable liner and cover.

3. PERFORMANCE

This site is on Spring Creek upstream of Iron Mountain Mine, a federal Superfund site. The lower reaches of Spring Creek will not support a fishery, regardless of the massive efforts taken at Iron Mountain Mine. However, the stream above the Stowell Mine does contain fish. The Regional Water Quality Control Board has worked closely with U.S. EPA and the mine owners to reduce metal loading as much as practical to the watercourse. Rather than establish numeric effluent limits on the discharge, the current permit allows for a “99%” removal of metals as measured from before any remedial actions (Table 3-1). The permit will soon be modified to

formally allow for land application of effluent and not require a National Pollutant Discharge Elimination System (NPDES) permit.

Table 3-1. Cleanup concentrations

Contaminant	Cleanup concentration
Cadmium	99% removal
Copper	99% removal
Zinc	99% removal

4. COSTS

No information available.

5. REGULATORY CHALLENGES

The discharge of effluent to surface waters required an NPDES permit. The conditions of such a permit could not be consistently achieved. The discharger chose to land-apply the effluent to avoid the numeric effluent limits that would be imposed by the NPDES permit. The Regional Water Quality Control Board has encouraged innovative technology to reduce metal loading to surface waters. Rather than establish numeric effluent limits on the discharge, the current permit allows for a “99%” removal of metals as measured from before any remedial actions. The permit will soon be modified to formally allow for land application of effluent and not require an NPDES permit.

6. STAKEHOLDER CHALLENGES

No information available.

7. OTHER CHALLENGES AND LESSONS LEARNED

Spring Creek downstream of the Stowell Mine and Iron Mountain Mine will never be clean enough to support a fishery. Although all point sources of metals are remediated or controlled, the diffuse, nonpoint sources of metals that enter Spring Creek are part of the baseline flow of groundwater into the gaining stream and cannot be controlled. Eventually, it is expected the U.S. EPA will waive the state and federal requirements for support of a fishery in Spring Creek at and below Iron Mountain Mine; however, the state faces a near impossible task of achieving a similar goal upstream of Iron Mountain Mine via conducting a use-attainability analysis, developing site-specific water quality objectives, and modifying the beneficial uses assigned to Spring Creek. The U.S. EPA is very reluctant to pursue removal of beneficial uses even though they have not existed for over 100 years.

8. References

No information available.