



Tucson Office
3031 West Ina Road
Tucson, AZ 85741
Tel 520.297.7723 Fax 520.297.7724
www.tetrattech.com

Technical Memorandum

To:	Kathy Arnold	From:	David Krizek
Company:	Rosemont Copper Company	Date:	August 31, 2010
Re:	Rosemont Area-Wide Fate and Transport and DIA Summary	Doc #:	243/10-320877-5.3
CC:	M. Williamson, A. Hudson, M. Gabora, K. Thompson (Tetra Tech); G. O'Brien (Engineering Analytics)		

1.0 Introduction

Tetra Tech prepared a regional groundwater model as summarized in a Technical Memorandum titled *Rosemont Groundwater Flow Model Summary* (Tetra Tech, 2010a). Modeling efforts indicate that a terminal pit lake will form in the Open Pit following the cessation of active dewatering operations. A particle tracking analysis was then performed to determine the capture zone of the pit. A capture zone that encompassed all of the mine facilities would ensure that any potential contaminants would flow into the pit lake and there would be no impact to the surrounding groundwater.

The results of this particle tracking analysis are presented in Attachment A in a Technical Memorandum titled *Rosemont Area-Wide Fate and Transport and DIA Assessment* (Tetra Tech, 2010b). Particle tracking indicates that the majority of the Project facilities will be within the capture zone of the pit. A comparison of potential discharges from facilities outside the capture zone to local groundwater was made, indicating that the groundwater quality would not be affected. Therefore, area-wide fate and transport modeling was not required. The proposed extent of the DIA would then be coincident with the Pollutant Management Area (PMA).

An assessment of potential seepage volumes and quality from APP-regulated facilities was prepared as part of this analysis. This information is provided for reference in Attachment B in a Technical Memorandum titled *Potential Sources Volumes and Chemical Makeup for Area-Wide Fate and Transport Modeling – Rosemont Copper Project* (Tetra Tech, 2010c).

This information is in response to the April 14, 2010 Comprehensive Request for Additional Information from the Arizona Department of Environmental Quality (ADEQ) to Rosemont Copper Company (Rosemont) as part of the APP application submitted to ADEQ in February 2009 (Tetra Tech, 2009). Specifically, this Technical Memorandum and attachments answer the following:

HYDROGEOLOGIC DEFICIENCIES

- Item no. 1 on pages 1 and 2 of 18. The application and supporting documents identify a number of reports that are either pending or completed, but do not appear to have been submitted for review. The following documents are necessary to continue the review of the application. They are identified by title, with the location if the reference indicated in parentheses:

Fate and Transport Analysis (Application, Table 7.41)

- Item no. 8 on pages 3 and 4 of 18. Section 9.2 of the Application indicates that a quantitative groundwater flow model and fate and transport modeling are currently in progress. Section 1.0 of the application indicates that a detailed groundwater flow model, a pit lake geochemical model, and updated facility infiltration and seepage models will be submitted. Section 4.13 of the Application indicates that studies regarding quantities of groundwater withdrawal from the pit are also underway. Please submit the results of these studies and modeling efforts to address the following components of the hydrologic study required in rule.

R18-9-A202(A)(8)(b)(x): Any changes in the water quality expected because of the discharge.

R18-9-A202(A)(8)(b)(xii): A map of the facilities discharge impact area (Refinement of current delineation, as necessary).

R18-9-A202(A)(8)(b)(xiii): The criteria and methodologies used to determine the discharge impact area.

ENGINEERING DEFICIENCIES

- Item no. 20 on page 11 of 18. PW Pond Leak Detection System (p. 2-9) – A fate and transport analysis is not required for the PWTS Pond because the facility has been designed to be non-discharging. Pursuant to A.R.S. 49-241, PWTS will be treated as a discharging facility under the Aquifer Protection Program (APP). Therefore, please submit a fate and transport analysis for the facility.
- Item no. 23 on page 11 of 18. Settling Basin (p. 3-5) – It is stated that a fate and transport analysis is not required for the Settling Basin because the facility will only be used on a temporary basis during process upset conditions. Pursuant to A.R.S. 49-241, Settling Basin will be treated as a discharging facility under the Aquifer Protection Program (APP). Therefore, please submit a fate and transport analysis for the facility.



REFERENCES

- Tetra Tech (2009). *Aquifer Protection Permit (APP) Application*. Prepared for Rosemont Copper Company. Report Dated February 2009.
- Tetra Tech, Krizek, D. (2010a). *Rosemont Groundwater Flow Model Summary*. Technical Memorandum to Kathy Arnold (Rosemont Copper Company). Technical Memorandum dated August 31, 2010.
- Tetra Tech, Thompson, K. (2010b). *Rosemont Area-Wide Fate and Transport and DIA Assessment*. Technical Memorandum to Kathy Arnold (Rosemont Copper Company). Technical Memorandum dated August 31, 2010.
- Tetra Tech, Krizek, D. (2010c). *Potential Source Volumes and Chemical Makeup for Area-Wide Fate and Transport Modeling – Rosemont Copper Project*. Technical Memorandum to Kathy Arnold (Rosemont Copper Company). Technical Memorandum Dated August 23, 2010.

ATTACHMENT A
TECHNICAL MEMORANDUM
ROSEMONT AREA-WIDE FATE AND TRANSPORT AND DIA
ASSESSMENT

Rosemont Copper Project

Locator Sheet

Record # 013379

Document Date 2010 08 31

Document Title: Rosemont Area-Wide Fate and Transport and DIA Assessment

Author/Recipient Keith Thompson, Tetra Tech

Description Documents the results of the DIA analysis, which is based on TT's regional groundwater flow models.

Other Notes Attachment A of 013378.

This document is located in the following: **CIRCLE THE CATEGORY (from the list below) IN WHICH THIS ITEM IS FILED**

1. **Project Management**
 - a. Formal recommendations & Directions
 - b. Formal meeting minutes & memos
 - c. General Correspondence
 - d. Contracts, Agreements, & MOUs (Rosemont, Udall, SWCA)
 - e. Other
2. **Public Involvement**
 - a. Announcements & Public Meetings
 - b. Mailing Lists
 - c. Scoping Period Comments
 - d. Udall Foundation Working Group
 - e. Scoping Reports
 - f. Comments after Scoping Period
 - g. DEIS Public Comments
3. **Agency Consultation & Permits**
 - a. Army Corps of Engineers (404 permit)
 - b. US Fish & Wildlife Service (Sec. 7 T&E)
 - c. State Historic Preservation Office (Sec. 106)
 - d. Tribes (Sec. 106)
 - e. Advisory Council on Historic Preservation (Sec. 106)
 - f. Other
 - g. AZ Dept of Environmental Quality (APP)
4. **Communication**
 - a. Congressional
 - b. Cooperating Agencies
 - c. Organizations
 - d. Individuals
 - e. FOIA
 - f. Internal
 - g. Proponent
5. **Proposed Action**
 - a. Mine Plan (including compilation)
 - b. Supporting Documents
 - c. Detailed Designs
 - d. References
6. **Alternatives**
7. **Resources**
 - a. Cumulative Effects Catalog
 - b. Connected Actions
 - c. Dismissed from Detailed Analysis
 - d. Analyzed in Detail
 - i. Barrel McCleary
 - ii. Barrel Only
 - iii. Scholefield McCleary
 - e. Air Quality & Climate Change
 - f. Biological
 - g. Dark Skies
 - d. Fuels & Fire Management
 - e. Hazardous Materials
 - f. Heritage
 - g. Land Use
 - h. Livestock Grazing
 - i. Noise & Vibration
 - j. Public Health & Safety
 - k. Recreation & Wilderness
 - l. Riparian
 - m. Socioeconomics & Environmental Justice
 - n. Soils & Geology
 - o. Transportation & Access
 - p. Visual
 - q. Water
8. **Reclamation**
 - a. Plans & Reports
 - b. Notes & Correspondence
 - c. References
 - d. Other
9. **DEIS**
 - a. DEIS
 - b. References
10. **FEIS**
11. **Geospatial Analysis (GIS Data)**
12. **FOIA Exempt Documents**
13. **ROD (including BLM & ACOE)**

ATTACHMENT B
TECHNICAL MEMORANDUM
POTENTIAL SOURCE VOLUMES AND CHEMICAL MAKEUP
FOR AREA-WIDE FATE AND TRANSPORT MODELING –
ROSEMONT COPPER COMPANY

Rosemont Copper Project
Locator Sheet

Record # 013380

Document Date 2010 08 23

Document Title: Potential Source Volumes and Chemical Makeup for Area-Wide Fate and Transport Modeling - Rosemont Copper Project.

Author/Recipient David Krizek, Tetra Tech

Description Provides estimated source volumes & chemical makeup for use as needed, in the area-wide fate & transport modeling work.

Other Notes Attachment B of 013378.

This document is located in the following: [CIRCLE THE CATEGORY (from the list below) IN WHICH THIS ITEM IS FILED]

1. **Project Management**
 - a. Formal recommendations & Directions
 - b. Formal meeting minutes & memos
 - c. General Correspondence
 - d. Contracts, Agreements, & MOUs (Rosemont, Udall, SWCA)
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 - a. Army Corps of Engineers (404 permit)
 - b. US Fish & Wildlife Service (Sec. 7 T&E)
 - c. State Historic Preservation Office (Sec. 106)
 - d. Tribes (Sec. 106)
 - e. Advisory Council on Historic Preservation (Sec. 106)
 - f. Other
 - g. AZ Dept of Environmental Quality (APP)
4. **Communication**
 - a. Congressional
 - b. Cooperating Agencies
 - c. Organizations
 - d. Individuals
 - e. FOIA
 - f. Internal
 - g. Proponent
5. **Proposed Action**
 - a. Mine Plan (including compilation)
 - b. Supporting Documents
 - c. Detailed Designs
 - d. References
6. **Alternatives**
- a. Cumulative Effects Catalog
- b. Connected Actions
- c. Dismissed from Detailed Analysis
- d. Analyzed in Detail
 - i. Barrel McCleary
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 - h. Livestock Grazing
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