

Debby Kriegel/R3/USDAFS
09/14/2009 09:21 AM

To Melinda D Roth/R3/USDAFS@FSNOTES
cc
bcc
Subject Re: Rosemont FAQs 

This looks good. It covers the major questions people might have.

Two additional items that come to mind...

1. What issues have been identified?
2. Who is on the IDT? (this might let the public know that we have specialists working on each key issue, but maybe just titles.....not names)

Thanks.

Melinda D Roth/R3/USDAFS



Melinda D Roth/R3/USDAFS
09/08/2009 03:34 PM

To dkriegel@fs.fed.us, dsebesta@fs.fed.us, jable@fs.fed.us, sidavis@fs.fed.us, sshafiqullah@fs.fed.us, Walter Keyes/R3/USDAFS@FSNOTES, abelauskas@fs.fed.us, aelek@fs.fed.us, ecuriel@fs.fed.us, gmckay@fs.fed.us, kbrown03@fs.fed.us, kellett@fs.fed.us, ljones02@fs.fed.us, Mary M Farrell/R3/USDAFS@FSNOTES, riefevre@fs.fed.us, temmett@fs.fed.us, William B Gillespie/R3/USDAFS@FSNOTES, rlaford@fs.fed.us, beverson@fs.fed.us, Teresa Ann Ciapusci/R3/USDAFS@FSNOTES, mreichard@swca.com, tfurgason@swca.com, ccoyle@swca.com, Heidi Schewel/R3/USDAFS@FSNOTES

cc

Subject Rosemont FAQs

I'd like to develop and post to our website some basic project information. Basic information could help 1) educate the public about the project 2) answer general questions 3) limit mis-information 4) limit the time required to answer basic questions... I'd like to ask you all to review the list of questions I have and give me some input on other basic questions that come to mind. Thanks.

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)



(520) 388-8305 (FAX) FAQ list.docx

**Frequently Asked Questions
Rosemont Copper Project
Coronado National Forest, Arizona
September 2009**

*To Extended IDT
9-8-09 asking
for ideas.*

Heard from Melissa.

What is this project?

Where is this project?

What products would the mine produce?

What is the expected life of the proposed mine?

What is the planning and decision-making timeline?

When would this project be implemented?

Who is involved in this project?

What is "NEPA"?

How has the public been involved?

How can the public remain involved?

Why is the Forest completing an Environmental Impact Statement?

Why not just "say no"?

Are there other actions connected to the mine proposal?

What assures that post-mine reclamation will be successful?

Where can I go for more information?

Confusion over "Resolution Copper Mine"

Frequently Asked Questions

Rosemont Copper Project

Coronado National Forest, Arizona

September 2009



What is this project?

In July 2007, the Coronado National Forest received a proposal from Augusta Resource Corporation to construct, operate, and reclaim a large copper mine in the Santa Rita Mountains south of Tucson. The project, as proposed, would occur on private lands owned by Augusta Resource Corporation, federal lands managed by the Forest Service and the Bureau of Land Management, and Arizona State Trust Lands. Direct impacts to roughly 4415 acres would occur and roughly 4635 acres would be closed to public entry for the life of the mine.

Where is this project?

The proposed project is roughly 30 miles southeast of Tucson, Arizona, west of State Route 83, on the east-facing slope of the Santa Rita Mountains within Townships 18 and 19 South and Ranges 15 and 16 East, Gila and Salt River Meridian. This area lies in Pima County.

What products would the mine produce?

Annually, the mine would produce roughly 234 million pounds of copper, 4.5 million pounds of molybdenum, and 2.7 million ounces silver.

What is the expected life of the proposed mine?

The anticipated life of the Rosemont Copper Project is 25 years, including construction, operations, and post-mine reclamation activities.

What is the planning and decision-making timeline?

The Coronado National Forest is the lead agency for the preparation of an Environmental Impact Statement (EIS). Currently, a Draft EIS (DEIS) is scheduled for public release and comment in November 2009. Following a 90-day public review and comment period and analysis of public comments, a Final EIS (FEIS) would be released. The FEIS is scheduled for release in July 2010. The actual decision, documented in a Record of Decision (ROD), would follow release of the EIS. BLM and COE///

When would this project be implemented?

An exact timeline cannot be predicted with any certainty since the Forest Service decision is subject to appeal and litigation. Rosemont Copper Company's plan is to begin construction as soon as possible. No mine-related activity could proceed until all appeals and litigation was decided. After a decision to

allow mine-related activities on National Forest System lands, Rosemont Copper would be required to submit a Mine Plan of Operations (MPO)///

Who is involved in this project?

There are many formal players in this project. Rosemont Copper Company is the project proponent. The Coronado National Forest is the lead agency. Numerous other tribal, federal, state, and local agencies that have some permitting authority or special expertise relating to the proposal to mine are Cooperating Agencies. The Forest Service has contracted with SWCA, a private consultant, to prepare the EIS. The State Historic Preservation Officer, US Fish and Wildlife Service, Arizona Game and Fish Department, Arizona Department of Transportation, Pima County and City of Tucson are among the agencies involved. See the forest website for more information regarding Cooperating Agencies. Connected to the proposal is the need for electric power to the site. Tucson Electric Power///

What is "NEPA"?

NEPA stands for the National Environmental Policy Act. This law, enacted by Congress in 1970, established a policy for public involvement and environmental review of proposed projects involving federal agencies such as the Forest Service and BLM in this case. NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

How has the public been involved?

NEPA requires an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process is termed scoping. The scoping process begins with the publication of a notice of intent in the Federal Register briefly describing the proposed action and explaining the purpose and need for the project. The public is invited to participate and public meetings are held to solicit comments regarding the concerns stemming from the proposed action. Public comment is used to identify alternatives to the proposed action and also helps frame the issues and effects needing detailed study and documentation in the EIS.

1. the significant issues to be analyzed in depth in the environmental impact statement.
2. Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3), narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere.
3. Hold an early scoping meeting or meetings which may be integrated with any other early planning meeting the agency has. Such a scoping meeting will often be appropriate when the impacts of a particular action are confined to specific sites.

How can the public remain involved?

Stay informed – websites

Review and comment on the DEIS when it is released. Request to stay on the project mailing list

Blogs and twitter

Newspaper

Comment on DEIS and FEIS

Why is the Forest completing an Environmental Impact Statement?

An EIS is prepared where significant effects to the human environment are possible. An EIS provides full and fair discussion of significant environmental impacts and informs decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.

Why not just “say no”?

The U.S. Forest Service and Bureau of Land Management, are open to mineral entry under the 1872 Mining Law, subject to federal, state, and local requirements. (This federal policy was affirmed in the Mining and Minerals Policy Act of 1970 and the National Materials and Minerals Policy, Research and Development Act of 1980.)

Are there other actions connected to the mine?

Connected actions are those that... Siting and construction of power and water lines to serve the construction and operation of a mine are connected actions and will be analyzed...

What assures that post-mine reclamation will be successful?

Plan, bond...

Where can I go for more information?

Visit the following websites:

<http://www.rosemonteis.us>

<http://www.fs.fed.us/r3/coronado/rosemont/index.shtml>

<http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm>

<http://www.rosemontcopper.com/>

www.tep.com

from Melissa 9/8/09

1. What is the role of the Forest Service?

The role of the Forest Service is set by law and regulation. They must respond to and analyze all MPOs, including Rosemont Copper Company's (Company), under appropriate federal laws.

2. **Is this a done deal?**

3. Has the project been approved?

No. A preliminary MPO has been received. Information contained therein is considered sufficient to begin analysis under NEPA. The project can not be approved until an EIS is completed and a Record of Decision (ROD) is signed. The EIS process and the ROD will serve to provide information to be included in a Final MPO.

4. How can NEPA begin without a completed MPO?

The initial MPO only represents the Company's proposal. The MPO can only be completed after the EIS process where issues are identified, alternatives are developed, and analysis is conducted. The completed MPO will conform to the ROD based on the analysis in the EIS. The Final MPO must conform with the ROD or be withdrawn by the Company.

5. What did the NOI mean by using the words "grant permission"?

The ROD will identify under which circumstances (if any) that the Forest Service will allow the MPO to be implemented on lands under their jurisdiction.

6. How can I get involved?

The scoping period is the time for initial public comment. The identification of issues during scoping is the fundamental step in the EIS process. Concerns and issue statements identified during scoping will be used to develop a range of alternatives. The alternatives will be designed to resolve the issues to varying degrees. There may also be opportunities for the public to participate during the analysis. The public will have the opportunity to comment on the Draft EIS.

7. What is NEPA?

The National Environmental Policy Act (NEPA) of 1969, as amended, is the law that requires all federal agencies to consider environmental issues for "major" federal actions (42 U.S.C. 4321-4346). NEPA declares a national policy which encourages "productive and enjoyable harmony between man and his environment." NEPA requires Federal agencies to:

- use a systematic interdisciplinary approach in planning and decision making;
- consider the environmental impact of proposed actions;
- identify adverse environmental effects which cannot be avoided should the proposal be implemented;
- consider alternatives to the proposed action;
- consider the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity; and
- identify any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

8. What is an EIS?

An Environmental Impact Statement (EIS) must be completed prior to a federal agency implementing any major action that may significantly alter the physical, biological, social, and economic environments. An

EIS prepared to describe the effects for proposed activities on the environment. An EIS describes impacts, as well as ways to mitigate impacts or reduce impacts on the environment.

9. Who is SWCA?

SWCA Environmental Consultants (SWCA) was selected to work under the direction of the Forest Service to assist with the preparation of the EIS. SWCA is an employee-owned company of cultural and natural resource scientists and planners. SWCA's professionals specialize in environmental and cultural resource permitting, compliance, and management. Headquartered in Phoenix, Arizona, SWCA has offices throughout the West, Pacific Northwest, and Hawaii.

10. What was the selection process of SWCA?

11. Why haven't you provided alternatives?

Alternatives are developed based on issues identified during the scoping process. Once the issues are identified, an Interdisciplinary Team will develop alternatives to address the issues to varying degrees. The final alternatives to be analyzed will be decided by the Forest Supervisor and reviewed by the Regional Forester.

12. Who makes the decision?

The Deciding Official for the Coronado National Forest will be the Forest Supervisor.

13. What happens with my comments?

Each comment (letter, email, oral comment, etc.) is given a unique identification number. Each comment is carefully read. Common issues and themes are identified and coded on each comment. In particular, the Forest Service is looking for comments that:

- Improve understanding of the physical, biological, and socio-economic environments
- Profile important information and reports
- Highlight information sources and data gaps
- Spotlight alternatives and mitigation
- Focus analysis on relevant issues
- Identify interested parties and cooperators



jsturgess@augustaresource.com

11/20/2009 07:23 AM

Please respond to
jsturgess@augustaresource.com

To "Mindee D Roth em" <mroth@fs.fed.us>, "Reta Laford" <rlaford@fs.fed.us>

cc "Kathy Arnold ROSEMONT" <karnold@rosemontcopper.com>, "Rod Pace" <rpace@rosemontcopper.com>

bcc

Subject Fw: Augusta Receives New Permitting Schedule for Rosemont Copper Project

Sent from my Verizon Wireless BlackBerry

From: Augusta Resource Corporation <info@augustaresource.com>

Date: Fri, 20 Nov 2009 09:16:05 -0500

To: <jsturgess@augustaresource.com>

Subject: Augusta Receives New Permitting Schedule for Rosemont Copper Project



Augusta Receives New Permitting Schedule for Rosemont Copper Project

Denver, CO, November 20, 2009 – Augusta Resource Corporation (TSX/NYSE Amex: AZC) ("Augusta" or "the Company") has been advised by the United States Forest Service (USFS) of the new timeline for completion of the Draft Environmental Impact Statement (DEIS) and the final Record of Decision (ROD) for the Rosemont copper project.

The DEIS is expected to be released to the public early in the second quarter of 2010, followed immediately by a series of public meetings and a comment period. The ROD is expected in the fourth quarter of 2010. These new dates are outlined in an updated memorandum of understanding signed this week between Augusta's 100%-owned subsidiary Rosemont Copper Company and the USFS.

Jamie Sturgess, Augusta Vice-President Sustainable Development said: "This is a very complex and important project and we appreciate the amount of diligence the USFS has undertaken in its analysis. Our goal is to make the Rosemont project the best it can possibly be – a model not only for Arizona but for the industry. The Company will continue to implement our project financing strategy in anticipation of permits late next year."

About Augusta

Augusta is a base metals company focused on advancing the Rosemont copper deposit near Tucson, Arizona. Rosemont hosts a large copper/molybdenum reserve that may account for about 10% of US copper output once in production in 2012 (for details refer to <http://www.augustaresource.com/>). The exceptional experience and strength of Augusta's management team, combined with the developed infrastructure and robust economics of the Rosemont project, will propel Augusta to become a solid mid-tier copper producer. The Company is traded on the Toronto Stock Exchange and the NYSE Amex under the symbol AZC, and on the Frankfurt Stock Exchange under the symbol A5R.

For additional information please visit <http://www.augustaresource.com/> or contact:

Meghan Brown, Investor Relations Manager
tel 604 638 2002
email mbrown@augustaresource.com

CAUTIONARY STATEMENTS REGARDING FORWARD LOOKING INFORMATION

Some of the statements made and information contained herein may contain forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and forward-looking information within the meaning of applicable Canadian securities laws. Such forward-looking statements and forward-looking information include, but are not limited to statements concerning: Augusta's plans at the Rosemont project; estimated production; and capital and operating and cash flow estimates. Forward-looking statements or information include statements regarding the expectations and beliefs of management. Often, but not always, forward-looking statements and forward-looking information can be identified by the use of words such as *plans*, *expects*, *is expected*, *budget*, *scheduled*, *estimates*, *forecasts*, *intends*, *anticipates*, or *believes* or the negatives thereof or variations of such words and phrases or statements that certain actions, events or results *may*, *could*, *would*, *might* or *will* be taken, occur or be achieved. Forward-looking statements or information include, but are not limited to, statements or information with respect to known or unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or information.

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info@augustaresource.com

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[Click Here](#) to unsubscribe from this mailing list.



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Mitigation



Mary M Farrell/R3/USDAFS
12/30/2009 01:13 PM

To Beverley A Everson/R3/USDAFS@FSNOTES
cc tfurgason@swca.com, sgriset@swca.com, William B Gillespie/R3/USDAFS@FSNOTES, Melinda D Roth/R3/USDAFS@FSNOTES, "Melissa Reichard"
bcc
Subject Re: Final versions of mitigation tables and homework due Jan. 6

Bev --

I downloaded the mitigation chart from the web site, made my changes to the heritage section, and uploaded it back up to EIS / Chapter 2, with my initials MMF and today's date as a suffix. If you have any trouble seeing it, let me know and I can send it via email, it's not too large.

Mary

Mary M. Farrell
Heritage Program Leader and Tribal Liaison
Coronado National Forest
300 W. Congress
Tucson, AZ 85701
(520) 388-8391
(520) 388-8305 (fax)
Beverley A Everson/R3/USDAFS



Beverley A
Everson/R3/USDAFS
12/23/2009 04:09 PM

To aelek@fs.fed.us, Deborah K Sebesta/R3/USDAFS@FSNOTES, dkriegel@fs.fed.us, ecuriel@fs.fed.us, gmckay@fs.fed.us, kbrown03@fs.fed.us, kellett@fs.fed.us, ljones02@fs.fed.us, Mary M Farrell/R3/USDAFS@FSNOTES, Melinda D Roth/R3/USDAFS@FSNOTES, mreichard@swca.com, riefevre@fs.fed.us, sldavis@fs.fed.us, sshafiqullah@fs.fed.us, temmett@fs.fed.us, tfurgason@swca.com, Walter Keyes/R3/USDAFS@FSNOTES, William B Gillespie/R3/USDAFS@FSNOTES

cc

Subject Final versions of mitigation tables and homework due Jan. 6

Some of you weren't able to receive the links I sent from WebEx a few minutes ago, for the latest mitigation tables. You can find them in WebEx in Group Documents/EIS/Chapter 2/Chapter 2-mitigation. The documents are Supplemental Compilation (ACOE, Pima Co., etc) and Updated Mitigation Measures. Both were posted today.

The core IDT will be meeting on Jan. 6 in 6V6 from 9:00 to 4:30 to do the final review of mitigation. Please review these lists beforehand, and extended team members not attending the meeting, provide comments on mitigation in your resource area(s) prior to the meeting so that they can be included in the meeting review.

Thanks, and happy holidays!



"Blaine, Marjorie E SPL "
<Marjorie.E.Blaine@usace.army.mil>

01/20/2010 09:46 AM

To "Teresa Ann Ciapusci" <tciapusci@fs.fed.us>, "Jeanine Derby" <jderby@fs.fed.us>, "Reta Laford" <rlaford@fs.fed.us>
cc <tfurgason@swca.com>, "Alvarez, Cindy" <cindy_alvarez@blm.gov>, <daniel.moore@blm.gov>, "Melinda D Roth" <mroth@fs.fed.us>, "Beverley A Everson"
bcc

Subject RE: Presentation of Army Corps of Engineers Alternatives

Teresa Ann

Thank you very much. I have this on my calendar. Could you pls let me know which way "across the street is"....is that to the east or to the south? Where is the best parking?

I would imagine we can get through this in an hour and the max amount of time I'll have is 1.5 hours. Thanks for putting this together.

Marjorie

In the interest of the environment, please print only if necessary and recycle

-----Original Message-----

From: Teresa Ann Ciapusci [mailto:tciapusci@fs.fed.us]
Sent: Wednesday, January 20, 2010 8:43 AM
To: Blaine, Marjorie E SPL; Jeanine Derby; Reta Laford
Cc: tfurgason@swca.com; Alvarez, Cindy; daniel.moore@blm.gov; Melinda D Roth; Beverley A Everson
Subject: Presentation of Army Corps of Engineers Alternatives

Marjorie -

Jeanine and Reta are available to meet with you at 09:00 am on January 26 so you can present the set of alternatives the Corps wishes to see included in the Rosemont Copper Project DEIS. Please bring copies of any maps or other materials and send them to me electronically in advance of the meeting so I can get copies into the Administrative Record.

Cindy and Dan -

Marjorie requested this meeting to discuss the Corps needs with regard to the range of alternatives. Because BLM is also making decisions from the Rosemont environmental study, you are also invited to attend this presentation.

I have reserved Conference Room 1823 in the DiConcini Courthouse Building across the street from the Federal Building for this meeting. Entrance to the conference rooms is to the right of the Cafe entrance. You must knock on the door and a guard will provide access to the building. You will need ID to enter. The room will be available to us until noon.

Teresa Ann Ciapusci
Staff Officer
Ecosystem Management and Planning
Coronado National Forest
300 West Congress, FB42

Tucson, Arizona 85701
(520) 388-8350 office
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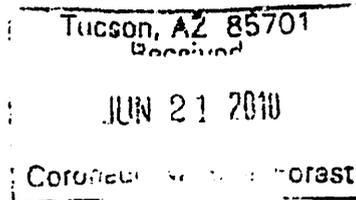
ROSEMONT COPPER

A Bridge to a Sustainable Future.

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CORPORATE WEB: www.augustaresource.com
ROSEMONT WEB: www.rosemontcopper.com

June 18, 2010

Ms. Reta Laford
Acting Forest Service Supervisor
Coronado National Forest
300 West Congress, 6th Floor
Tucson, Arizona 85701



Dear Ms. Laford:

The Mine Safety and Health Administration, U.S. Department of Labor, made an inspection of the Rosemont Copper Project on May 17 and 18, 2010, for the purpose of performing an annual safety inspection of the mine property. During the course of the inspection, the MSHA Inspector Mr. Enrique Vidal, an authorized representative of the Secretary of Labor, indicated that in his opinion many of the berms on the banks of roadways on the property were not adequate to protect those individuals using the roadways, including employees of Rosemont Copper and the general public, in accordance with the provisions of Title 30 C.F.R. Part 56.9300.

Rosemont Copper Company officials explained to the Mr. Vidal at that time that the roadways themselves and the maintenance of the roadways were under Forest Service jurisdiction, both on forest service land and on Rosemont Copper Company private property under Forest Service jurisdiction. Rosemont Copper Company officials also indicated that the roadways had been posted with a 15 mile per hour speed limit to minimize any hazards to employees and the general public from excessive speed on the roadways.

In making their assessment, MSHA quoted the standards for roadways under Title 30 C.F.R. Part 56.9300 which is specified below:

30 CFR § 56.9300

Berms or guardrails.

**SAFETY DEVICES, PROVISIONS, AND PROCEDURES FOR ROADWAYS,
RAILROADS, AND LOADING AND DUMPING SITES**

- (a) Berms or guardrails shall be provided and maintained on the banks of roadways where a drop-off exists of sufficient grade or depth to cause a vehicle to overturn or endanger persons in equipment.
- (b) Berms or guardrails shall be at least mid-axle height of the largest self-propelled mobile equipment which usually travels the roadway.
- (c) Berms may have openings to the extent necessary for roadway drainage.
- (d) Where elevated roadways are infrequently traveled and used only by service or maintenance vehicles, berms or guardrails are not required when all of the following are met:
 - (1) Locked gates are installed at the entrance points to the roadway.
 - (2) Signs are posted warning that the roadway is not bermed.
 - (3) Delineators are installed along the perimeter of the elevated roadway so that, for both directions of travel, the reflective surfaces of at least three delineators along each elevated shoulder are always visible to the driver and spaced at intervals sufficient to indicate the edges and attitude of the roadway.
 - (4) A maximum speed limit is posted and observed for the elevated unbermed portions of the roadway. Factors to consider when establishing the maximum speed limit shall include the width, slope and alignment of the road, the type of equipment using the road, the road material, and any hazardous conditions which may exist.
 - (5) Road surface traction is not impaired by weather conditions, such as sleet and snow, unless corrective measures are taken to improve traction.
 - (e) This standard is not applicable to rail beds.

It is the position of MSHA, as referenced in the standard quoted above that the berms shall be at least mid-axle height of the largest self-propelled mobile equipment which usually travels the roadway, and that the current berm height on the roadways is not adequate to meet this criteria in most locations. Typically, the largest self-propelled mobile equipment that currently travels the roadways are large pickups, SUV's, or recreational vehicles used by the general public or Rosemont Copper Company employees.

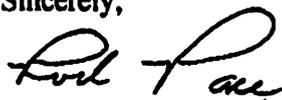
Rosemont Copper Company officials explained to the MSHA Inspector on May 17 and 18, 2010, and later to Mr. David Brown, Supervisory Mine Safety and Health Inspector for the MSHA Field Office in Mesa, Arizona, in a meeting on May 27, 2010, that Rosemont Copper Company could not modify the berms on the designated Forest Service roads on either Federal, public, or Rosemont Copper Company private lands since these roads fall under Forest Service jurisdiction.

Rosemont Copper Company told MSHA that it would notify and advise the Forest Service that MSHA was of the opinion that the berms on the roads do not meet MSHA safety standards as per 30 C.F.R. Section 56.9300.

Rosemont Copper Company requests that the Forest Service notify Rosemont Copper Company of receipt of this letter and of its decision regarding jurisdiction over the roadways within the proposed mining area until completion of the permitting process.

If you have any questions please do not hesitate to call me.

Sincerely,



Rod Pace
President and CEO
Rosemont Copper Company

520-445-7464

Certified Mail # 7009 3410 0001 3308 3639

cc: George + Walt 10-14-10



"Melissa Reichard "
<mreichard@swca.com>
11/06/2009 02:18 PM

To "Melinda D Roth" <mroth@fs.fed.us>
cc
bcc

Subject Task list from past 3 mos

History:  This message has been replied to and forwarded .

Mindee-
Here it is. Let me know if you need anything else.
Thanks!

Melissa Reichard
Project Administrator
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520)325-9194, (520)325-2033 fax

Sound Science. Creative Solutions.

"Man's mind, once stretched by a new idea, never regains its original dimensions."



-Oliver Wendell Holmes Task Lists for Past 3 mos.docx

Task Lists for August-October 2009

Project Management Meetings (ordered new to old)

- Tom- update Gantt Chart
- SWCA- Gather all alts and forward to Dale, start batching mitigations
- Chapter 1- with Reta's recent comments that SWCA doesn't have any more work on this, the FS will complete and forward through SWCA QAQC process
- Dale- batch alts and send to Bev and Mindee
- Mindee- forward letters from Cooperators regarding alts that SWCA doesn't have, tech reports from RCC, talk to Sarah and forward AR guidance to Melissa, set up meeting for Monday with Reta
- Bev- Forward Pima Co. GeoChem letter and contact other mines
- Melissa- update tech report tracking, look at WebEx databases
- Tom- scoping process overview/ issue development
- Sarah, Walt and Salek- alternative narratives
- Melissa- make changes to Scoping Report 3
- Tom- Alts. Dismissed table by Tuesday next week, Alternatives write-ups by COB Thursday
- Melissa- gather all alternatives materials, DEIS mailing list & flier design by end of October
- Mindee- check on status of units and issues with Reta
- Bev- note to IDT to review alternatives list and note anything that was missed
- SWCA- get Affected Environment sections peer reviewed, edited and formatted and send to specialists, cc:Bev
- Melissa- get Kevin's resume to Bev, tell Kevin about tech transfer mtg
- Bev- send Gantt chart to all, send tech transfer mtg info to Melissa
- Tom- DEIS alternative text
- Charles- forward SRK bounds of analysis to Bev
- Melissa- make requested changes, draft revised SR3, draft new flow chart, look at FSH 12.3.2 citation and verify correct, check OOS reasons- only 3?
- Bev- talk to Kriegel about units for recreation, send test plot email to TA, share Frog letters with SWCA
- Melissa- materials for IDT tomorrow: 15 copies of all cooperator feedback and spreadsheet to document rationale during review of comments
- TA- Cooperator meeting agenda and test plot announcement
- Tom- send TA NEPA module of SWCA's training, Socioeconomic memo to TA
- TA- Cooperators contact list including which agencies have expertise in certain areas
- Bev- get clarification from Salek of Pima County's hydro letter, look at Socioeconomics study letter from SWCA
- Mindee- SR3 feedback mtg with Bev, Mindee, Reta, Tom and Mel, talk to Jim Pepper and document trip
- Tom- revise Gantt chart by EOW (not too much detail), units of measure by Sept 1
- Bev- Talk to Mindee to get final issues
- TA- send FSM 20.20 to PM team
- Reta- check Jeanine Granger notes regarding EPA/Limehouse publish dates
- Melissa- send JABLE comment .mdb file- Cancelled

- SRK/MWH- look at Dry Stack Tailings report
- Bev- Give Tom a complete list of changes/additions to Alternative descriptions
- Melissa- DVD of reports by EOW, talk to Kathy regarding needs for 6c
- Mindee- process paper on Issues
- Melissa- finalize SR 1 and 2
- Bev- get with Debbie about necessary visual sims for Alternatives only, organize 19th IDT, email regarding audit
- MacIvor & Tom- Table of units of measure to Bev by EOW
- SWCA- alternative table with all elements flushed out by 19th
- Melissa- talk to Kathy regarding 6c alternative
- Tom- tracking sheet to Bev today

**IDT Meetings
(ordered new to old)**

- Melissa- Create effects analysis folder in WebEx
- Bill- check basement storage for any existing environment info
- Salek- upload alternatives GIS shape files to drive
- Bev- ask Districts to provide catalog of activities and upload excel sheet form to WebEx
- Mindee- announce EPA meeting info
- Salek- rationale for disposition of Alternatives presentation to Jeanine
- Sarah- Cooperators comments on alternatives presentation to Jeanine
- Walt- mitigations presentation to Jeanine
- SWCA- maps for Salek and document sideboards list
- Melissa- post Cooperator comment tracking sheet to WebEx
- Melissa- post Glamis Gold lawsuit on WebEx
- IDT-work with SWCA on units
- Melissa- fix CA folder permissions, leave calendar permissions for group, get Eli another invite and Jeremy Sautter and invite, follow up with TA regarding Pima Co request for GIS
- Larry & Debbie S.- look at riparian units
- Tom- research noise standards from county, post units to WebEx, assign elements to SRK
- Bev- talk to Rosemont and get toe line for McCleary, change order for SRK to delineate mineral resources, get redesign of #3 to be Sycamore and Barrel, what is the reasonable thickness of rind? And post Cooperator comments
- Bev and Mindee- Talk with TA about specialists and Cooperator meetings
- Melissa- Post contact log form in WebEx
- Tom- SRK/MWH to design Sycamore slurry- Cancelled

aware of this FOIA? I have the letter that was sent to Mr. Davis acknowledging his request and that the records search was under way. Who is assigned to provide the records to me and by when?

Thank you

Marc

Marc G. Kaplan
Planner Analyst
Coronado National Forest
300 W. Congress, Tucson, AZ 85701
520-388-8358

"Too often we underestimate the power of a touch, a smile, a kind word, a listening ear, an honest compliment, or the smallest act of caring, all of which have the potential to turn a life around."- Leo Buscaglia

From their errors and mistakes the wise and good learn wisdom for the future. ~ Plutarch



"Blaine, Marjorie E SPL "
<Marjorie.E.Blaine@usace.army.mil>

08/09/2010 03:14 PM

To "Brian Lindenlaub" <blindenlaub@westlandresources.com>, "Reta Laford" <rlaford@fs.fed.us>, <gcheniae@cox.net>, "Melinda D Roth" <mroth@fs.fed.us>

cc "Sturgess Jamie" <jsturgess@augustaresource.com>, "Katherine Arnold" <karnold@rosemontcopper.com>

bcc

Subject RE: Dos Pobres/San Juan 404b1

Brian

Actually, my comments to the USFS regarding purpose and need were not for the alternatives analysis or the basic/overall project purpose but the NEPA purpose and need; for that I used the DP/SJ EIS purpose and need which I felt was well constructed.

Marjorie

Assist us in better serving you!

You are invited to complete our customer survey, located at the following link: <http://per2.nwp.usace.army.mil/survey.html>

Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----

From: Brian Lindenlaub [mailto:blindenlaub@westlandresources.com]

Sent: Monday, August 09, 2010 11:58 AM

To: Blaine, Marjorie E SPL; Reta Laford; 'gcheniae@cox.net'; Melinda D Roth

Cc: 'Sturgess Jamie'; Katherine Arnold

Subject: Dos Pobres/San Juan 404b1

All,

In preparation for our call this afternoon I have attached a PDF copy of the Dos Pobres/San Juan 404b1 alternatives analysis. I understand that Marjorie referenced this project as a good example for describing the project purpose.

If you have any questions or there's a problem with the attachment, please let me know.

Regards,

Brian Lindenlaub | Principal

WestLand Resources, Inc.

4001 E Paradise Falls Drive | Tucson, AZ 85712

Office: (520) 206-9585 | Fax: (520) 206-9518



"Tom Furgason"
 <tfurgason@swca.com>
 08/09/2010 08:59 AM

To "Reta Laford" <rlaford@fs.fed.us>
 cc "Melinda D Roth" <mroth@fs.fed.us>, "Beverley A Everson" <beverson@fs.fed.us>, "Daniel Montez" <dmontez@fs.fed.us>, "Jonathan Rigg" <jrigg@swca.com>, bcc

Subject RE: Process for Processing Cooperating Agency Review Comments

Reta,

Thank you for the direction for proceeding with addressing comments on Chapter 1. We'll have a comment tracking sheet completed and make revisions accordingly. Assuming that we receive all of the comments in a timely manner, we should not have a problem completing this task before next Monday.

Tom

From: Reta Laford [mailto:rlaford@fs.fed.us]
Sent: Friday, August 06, 2010 6:54 PM
To: Daniel Montez; Tom Furgason
Cc: Melinda D Roth; Beverley A Everson; Reta Laford
Subject: Process for Processing Cooperating Agency Review Comments

Tom - Here's a recap of what we discussed for processing the Chapter 1 review comments from cooperating agencies, with consideration that I am out next week and Mindee is out most of next week . . .

The following tasks need to occur in order to demonstrate at the next Cooperating Agency meeting what we did with their comments . . .

- ✓ 1. Reta and Dan will forward incoming review comment emails / hardcopies to you at SWCA. *Bl M still needed*
 - ✓ 2. Incoming emails to Dan and Mindee that are not also sent to Reta, will also be forwarded to Reta.
 - ✓ 3. SWCA will enter all review comments into a table (5 columns: Agency, Commenter, Line Number, Comment, and Disposition).
 - ✓ 4. SWCA will draft proposed disposition of each comment.
 - ✓ 5. SWCA will enter, using Track Changes, requested edits into the attached document to produce a master for deliberation. *BLM + GG still needed*
 - ✓ 6. Mindee and Reta will review/edit/finalize SWCA's draft work upon their return to the office. *Date? 8/31 EDT review?*
 - Mindee* ✓ 7. ~~The disposition table will be shared at the August 19th CA Meeting. = ask Tom~~ *Will not share! per Reta*
 8. The revised Chapter 1 will be shelved for later incorporation into the Final DEIS.
- Thx! *Yippie!!*



Kathy Arnold
<karnold@rosemontcopper.com>

12/03/2009 10:37 AM

To Melissa Reichard <mreichard@swca.com>

cc Jamie Sturgess <jsturgess@augustaresource.com>, Melinda D Roth <mroth@fs.fed.us>, "tciapusci@fs.fed.us" <tciapusci@fs.fed.us>, Tom Furgason

bcc

Subject Re: Rosemont GIS files

Melissa -

I want to be sure the GIS files remain in context for the reporting. The alternatives that were generated at Tetra Tech will be available on a disk for you today.

I am requesting the consultants provide list of all GIS layers available on a per report basis so that I can provide the Forest Service, ACOE, BLM, and SWCA with the appropriate information necessary to prepare the EIS documents and perform analysis. We will provide a list of the information available and be prepared to answer your questions (and possibly provide electronic information) on a per request basis. As I have stated before I am concerned with sharing electronic information that will be packaged up and handed out to the state and local governments (those regulatory agencies that have permitting authorities can request information specific to their permits through appropriate channels). I remain concerned that electronic information, once turned over to others, becomes subject to change or misinterpretation if it is not in the context provided by the reports and not accompanied by the appropriate legends, footnotes, titles, etc.

Regards,
Kathy

Katherine Ann Arnold, P.E. | Director of Environmental and Regulatory Affairs
Cell: 520.784.1972 | Main: 520.297.7723 | Fax 520.297.7724

karnold@rosemontcopper.com



Rosemont Copper Company
P.O. Box 35130 | Tucson, AZ 85740-5130
3031 West Ina Road | Tucson, AZ 85741 | www.rosemontcopper.com

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From: Melissa Reichard <mreichard@swca.com>

Date: Mon, 23 Nov 2009 16:44:30 -0600

To: Katherine Arnold <karnold@rosemontcopper.com>, Melinda D Roth <mroth@fs.fed.us>, <tciapusci@fs.fed.us>, Tom Furgason <tfurgason@swca.com>

Cc: Jamie Sturgess <jsturgess@augustaresource.com>

Subject: RE: Rosemont GIS files

Kathy-

I understand your concern. You are correct about the Cooperators requesting this type of data. To my knowledge, the Forest will be receiving an index of the data that we have. We also have been, to date, the ones actually constructing any data layers and maps. So, I believe- at least initially- we will be the ones housing it on a secure server with very limited access. After we receive the data, index it and organize it, we will be utilizing it for the analysis in various draft/deliberative forms.

For the record- I understand that I need to capture all the GIS data when the DEIS is released to document available information at the time and then again at the release of the FEIS. I do not believe it will be in the record until those times.

As far as when, how and what the data will be released to Cooperators, we would need to refer to Mindee, TA or Reta.

I have heard back from Jim Davis at Montgomery and he is working on compiling data for me. I will alert him to run things by you first before my pick up.

Thanks!

Melissa

"Science is organized knowledge. Wisdom is organized life." -Immanuel Kant

From: Kathy Arnold [<mailto:karnold@rosemontcopper.com>]
Sent: Monday, November 23, 2009 3:31 PM
To: Melissa Reichard; Melinda D Roth; tciapusci@fs.fed.us; Tom Furgason
Cc: Jamie Sturgess
Subject: Re: Rosemont GIS files

Melissa-

We have been hesitant to turn over GIS files for materials because the Forest has been asked by the cooperators to give them any GIS files developed. Because of the state sunshine rules, some of your cooperators may feel obliged to share the layers which we are concerned would end up publically disseminated without context.

What is the intent of gathering additional GIS information? Where will this be used/housed/etc.? Because we have some items that have not been submitted to the Forest yet, I will need to review everything prior to my consultants pulling that information together – I will do my best to be sure we make your Dec. 3 deadline but I would like to know what the parameters are first.

Thanks -

Kathy

Katherine Ann Arnold, P.E. | Director of Environmental and Regulatory Affairs
Cell: 520.784.1972 | Main: 520.297.7723 | Fax 520.297.7724

karnold@rosemontcopper.com



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From: Melissa Reichard <mreichard@swca.com>
Date: Mon, 23 Nov 2009 13:16:21 -0600
To: Katherine Arnold <karnold@rosemontcopper.com>, <mroth@fs.fed.us>
Cc: Brian Lindenlaub <blindenlaub@westlandresources.com>, Hale Barter <hbarter@elmontgomery.com>, Jamie Joggerst <jamie.joggerst@tetrattech.com>, Jaime Wood <jwood@epgaz.com>, Teresa Ann Ciapusci <tciapusci@fs.fed.us>, Tom Furgason <tfurgason@swca.com>, <droth@m3eng.com>, <derek.whittwer@amec.com>
Subject: Rosemont GIS files

Hi Ladies-

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I'm sure that everyone is aware of our newly published, extremely tight, deadline for the DEIS. Therefore, I will be collecting these next Thursday morning- December 3rd. I plan on driving to all necessary locations to pick these up for you. If you have them done ahead of time, I can make other arrangements. I am also happy to help in any way I can to make this happen. The point being, that I need to make this happen in short order. So, please let me know if you encounter any obstacles that require my help.

This is the current list of companies/agencies that I have thought of to respond to this request:

Montgomery & Assoc
TetraTech
Rosemont Copper
Westland
AEC
Stantec
AMEC
M3
EPG
Forest Service
Pima County

I have tried to include all the necessary contacts, but there are a few that I didn't have contact information for. So, please look at the distribution and forward this on to whomever necessary and cc me.

I appreciate all of your attention and time on this task- especially in the Holiday season.

Melissa Reichard
Project Administrator
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520)325-9194, (520)325-2033 fax

Sound Science. Creative Solutions.

"Man's mind, once stretched by a new idea, never regains its original dimensions." -Oliver Wendell Holmes



"Melissa Reichard "
<mreichard@swca.com>
11/23/2009 03:44 PM

To "Kathy Arnold" <karnold@rosemontcopper.com>, "Melinda D Roth" <mroth@fs.fed.us>, <tciapusci@fs.fed.us>, "Tom Furgason" <tfurgason@swca.com>
cc "Jamie Sturgess" <jsturgess@augustaresource.com>
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Sent: Monday, November 23, 2009 3:31 PM

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Cc: Jamie Sturgess

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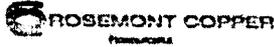
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Kathy

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TetraTech
Rosemont Copper
Westland
AEC
Stantec
AMEC
M3
EPG



Memo

From: Marc Schulte

To: Fermin Samorano, Bob Fong

Date: May 20, 2010

Re: Rosemont May 2010 Waste Alternative Design and Estimated Additional Costs

Rosemont Copper had MMTS look at two alternative waste placement options for the Rosemont mine; one that utilizes the Trail Creek area for additional waste placement room, and one that uses the McCleary area for waste placement and the Scholefield area for tailings placement.

Option 1, Waste placed in the Trail Creek and Upper Barrel area, Tails in the Barrel area:

In this alternative, waste would be moved out of the Upper Barrel area near the leach pads and instead placed in the Trail Creek area. As well, instead of placing tailings in the Phase 2 area, they would be moved to the now vacant Upper Barrel area near the leach pads.

In this scenario, the leach pile and crusher/plant infrastructure would remain in the same location as the base case feasibility study; and the mining pit and schedule of material coming out of the pit would also remain the same.

In this case the waste is deposited a greater distance from the mining pit than in the feasibility study. The additional costs to overhaul the waste and build additional mining infrastructure to access these new waste areas has been estimated.

From the analysis of this option, the extra mining costs would be:

- The total extra cumulative capital and operating costs for option 1, waste to Trail Creek and Upper Barrel, is
 - o \$51.9 million operating + \$10.5 capital = **\$62.4 million.**

Option 3, Waste placed in the McCleary and Upper Barrel areas, Tails in the Scholefield area:

In this alternative, most of the waste would be placed in the McCleary area, with some waste used to cover the leach piles in the Upper Barrel area. All of the tails would be placed in the Scholefield area.

In this scenario, the leach pile and crusher/plant infrastructure would remain in the same location as the base case feasibility study; and the mining pit and schedule of material coming out of the pit would also remain the same.

In this case the waste is deposited a greater distance from the mining pit than in the feasibility study. The additional costs to overhaul the waste and build additional mining infrastructure to access these new waste areas has been estimated.

From the analysis of this option, the extra mining costs would be:

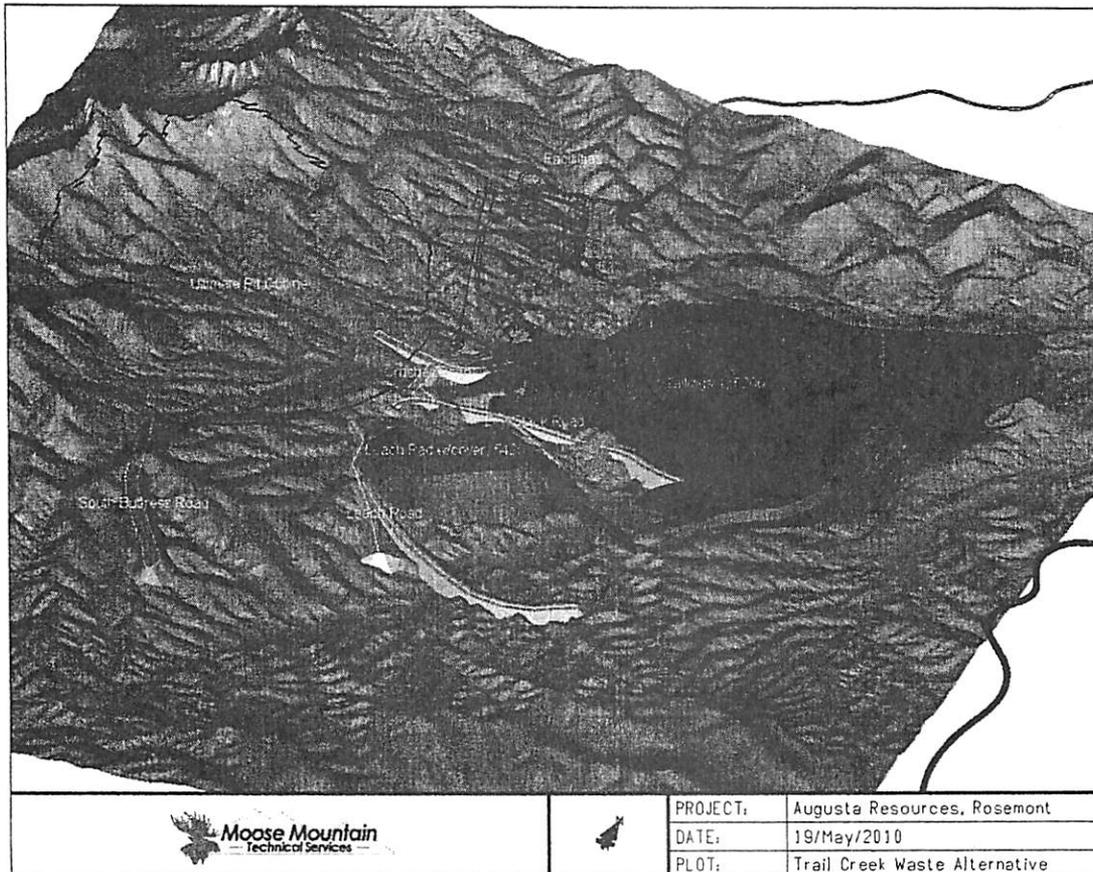
- The total extra cumulative capital and operating costs for option 2, waste to McCleary and Upper Barrel, tails to Scholefield, is
 - o \$209.4 million operating + \$35.0 capital = **\$244.4 million.**

The following screenshots show the sequential build-up of the these alternative waste plans.

Option 1 Sequence, Waste in Trail Creek and Upper Barrel area:

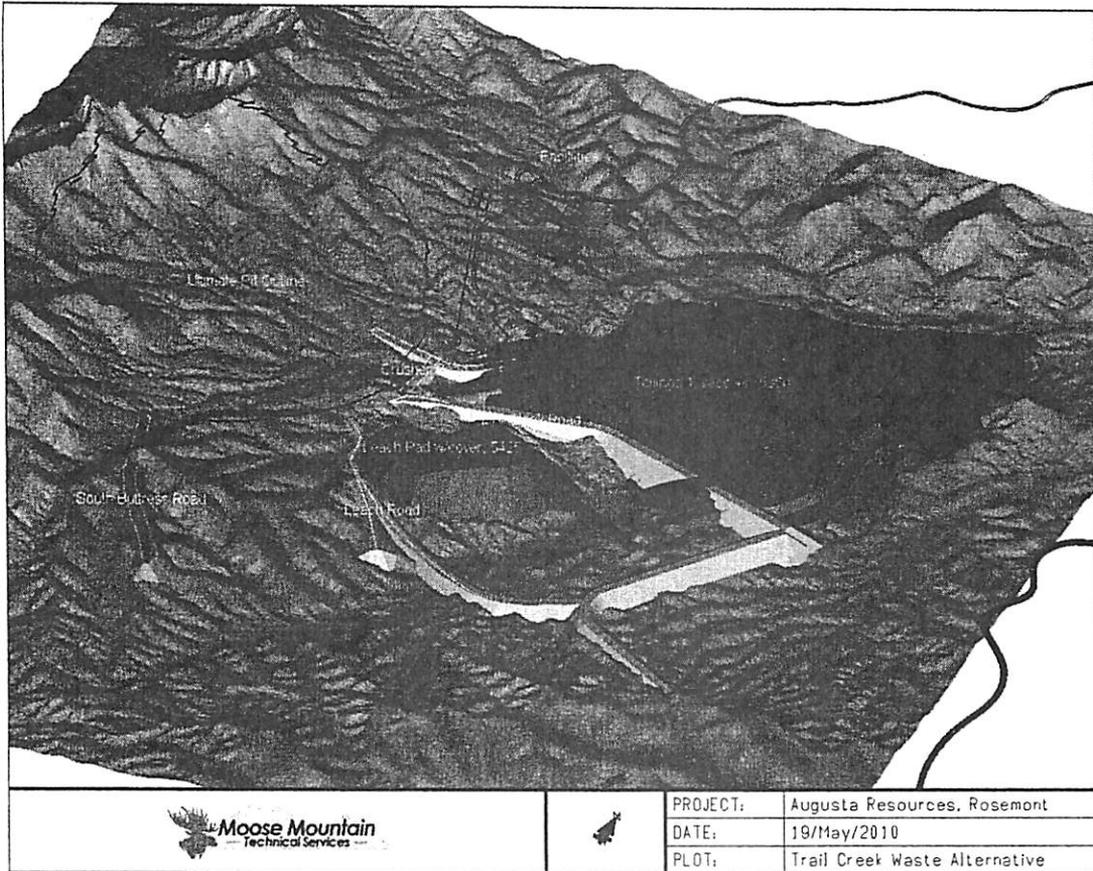
Common items:

- The first screenshot shows items that are common with the feasibility study plan
 - o Phase 1 tailings area common up to the 5200 lift.
 - o Leach, Dry Stack and South Buttress roads
 - o Channel Drain Fills under the phase 1 tailings area
 - o Pit Outline, Facilities and access roads to the site
 - o Leach pile and 50 ft. waste cover



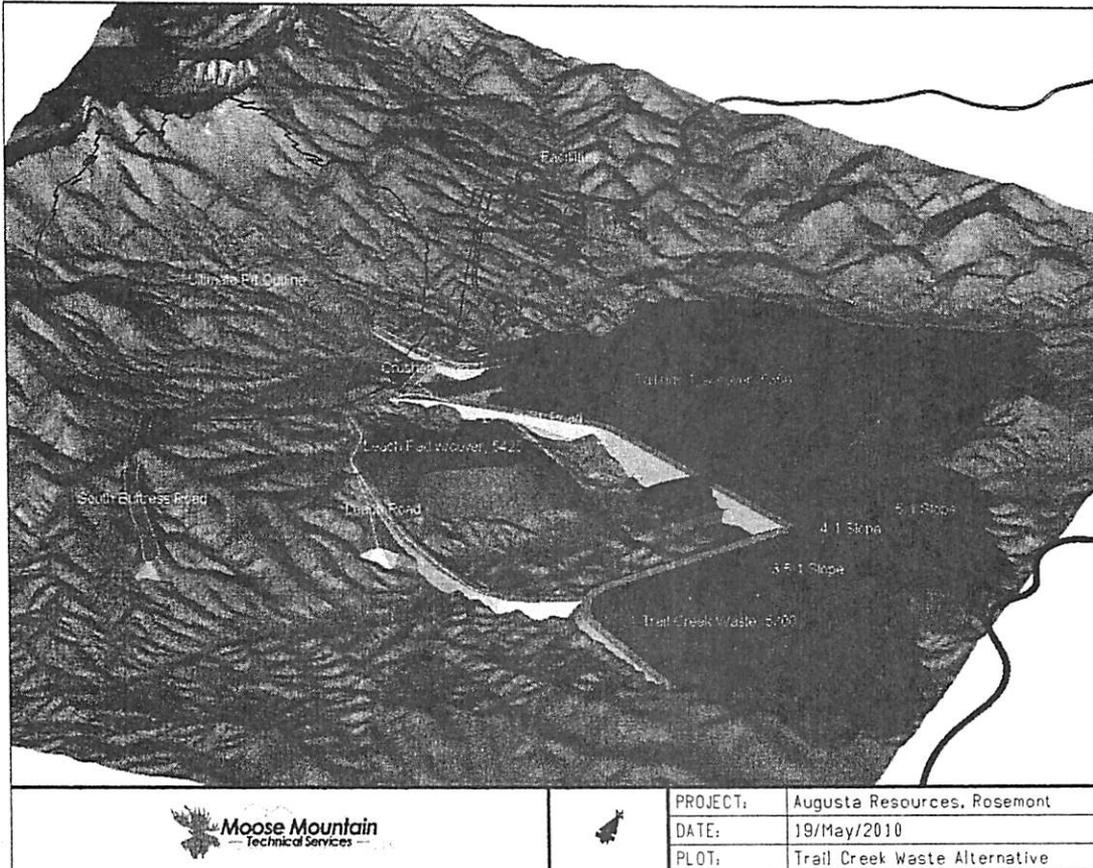
Phase 1 Tailings Build-Up:

- The second screenshot shows the phase 1 tailings built up to 5300 elevation, then capped with a 50ft waste lift to bring it to 5350 elevation.
- Also shown is an extension of the dry stack and leach roads to the 5200 elevation, and a connector road between them. These roads will be used over the life of the mine to access all of the waste areas, and after closure for drainage control.



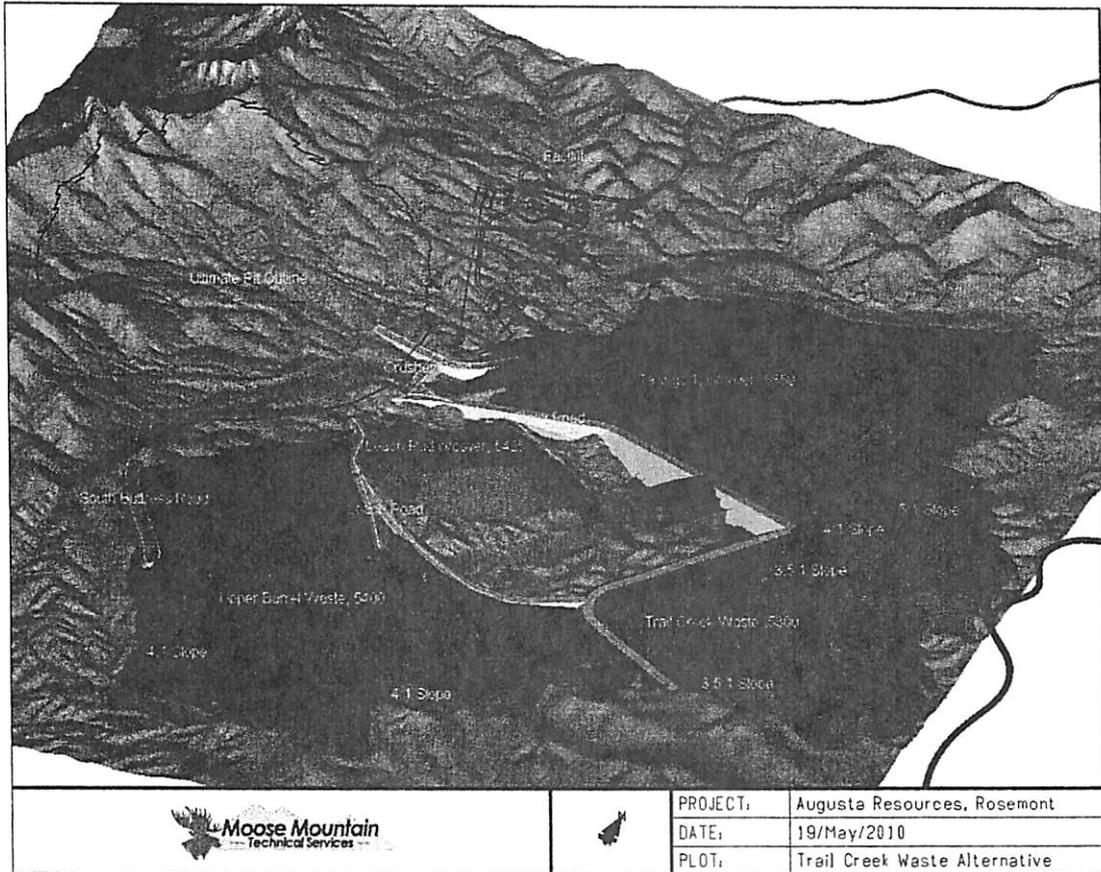
Trail Creek Waste Area to 5300 elevation:

- The third screenshot shows the trail creek waste area built up to the 5300 elevation
- Lifts shown at 5000, 5100, 5200 and 5300 elevation with 150ft. flat spots left between crests and toes



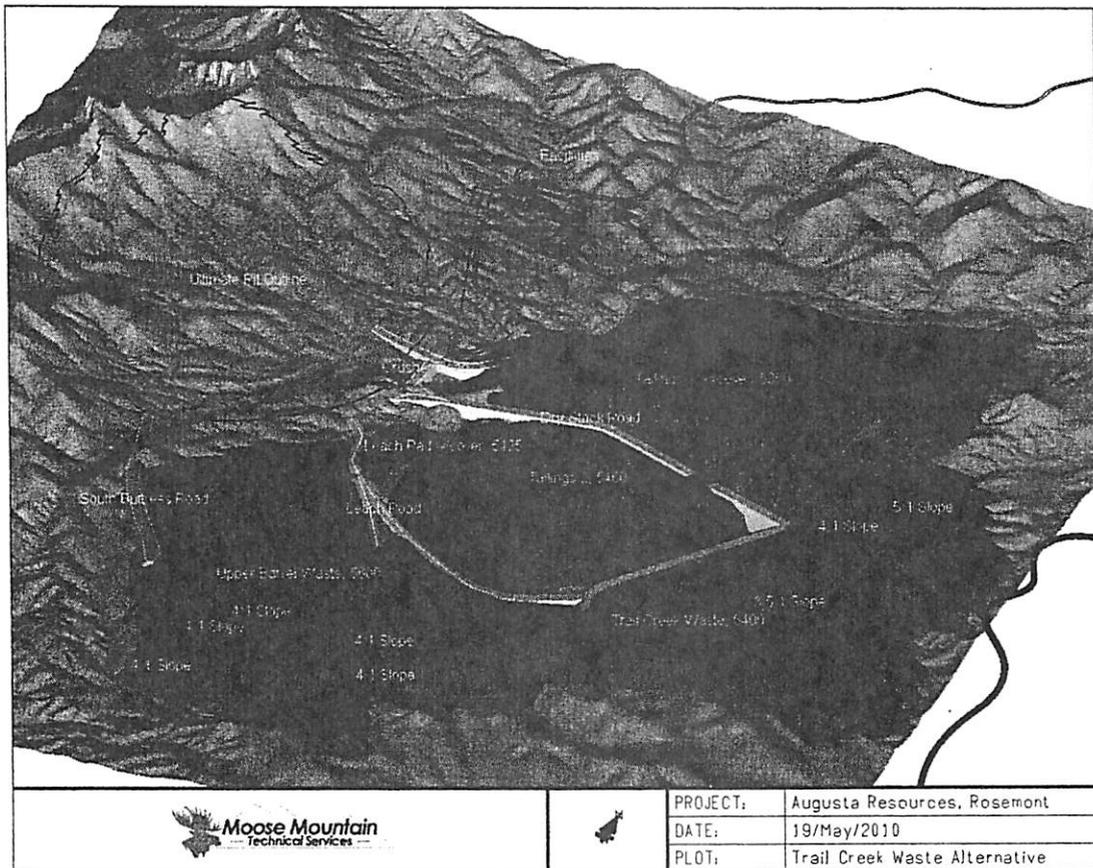
Upper Barrel Waste Area to 5400 elevation:

- The fourth screenshot shows the upper barrel waste area built up to the 5300 elevation
- Lifts shown at 5200, 5300 and 5400 elevation with 150ft. flat spots left between crests and toes.
- Outside slope is 4:1, with natural angle of repose (37 degrees) left on the inside slopes.



Upper Barrel Waste Area to 5600 elevation, Tails to 5460 elevation:

- The last screenshot shows the upper barrel waste area built up to the 5600 elevation.
- There are separate lifts shown at the 5500 and 5600 elevations, with a 150 ft flat spot left between the crest and the toe.
- Outside slope is 4:1, with natural angle of repose (37 degrees) left on the inside slopes.
- The dry stack tailings, now in the upper barrel area near the leach pad is shown built up to the 5,460 elevation.
- Built up at a natural angle of repose (37 degrees).
- No cover shown on this tailings structure, it would have to be rehandle mined from either Upper Barrel or Trail Creek waste areas. This rehandle would likely build up the tailings area to the 5500 elevation and require about 38Mtons of waste.



The following table shows the quantities of material in each designed waste and tails area:

Total waste in mining schedule = 1,232,308 ktons

Total tails produced from mining schedule = 378,858 kyd³

Item	Size (ktons)
South Buttress Road	6,070
Leach Road	10,002
Leach Road Extension	2,056
Dry Stack Road Roads	25,218
North South Connector Road	21,489
North Screen Berm	34,945
DST Phase 1 Buttress 5200	90,056
DST Phase 1 Buttress 5250	9,064
DST Phase 1 Buttress 5300	4,680
Phase 1 Tailings Cap	33,825
Channel Fills South	3,674
Leach Pad	2,500
Leach Cap	31,686
Trail Creek Waste Dump 4900	30,130
Trail Creek Waste Dump 5000	66,712
Trail Creek Waste Dump 5100	87,881
Trail Creek Waste Dump 5200	88,715
Trail Creek Waste Dump 5300	51,907
Trail Creek Waste Dump 5400	51,499
Upper Barrel Waste Dump 5200	120,007
Upper Barrel Waste Dump 5300	154,848
Upper Barrel Waste Dump 5400	153,578
Upper Barrel Waste Dump 5500	98,417
Upper Barrel Waste Dump 5600	52,984

Item	Size (kyd ³)
Tailings in Phase 1 to 5200	180,212
Tailings in Phase 1 above 5200	16,593
Tailings Next to Leach Pad	181,285

Option 3 Sequence, Waste in McCleary and Upper Barrel area:

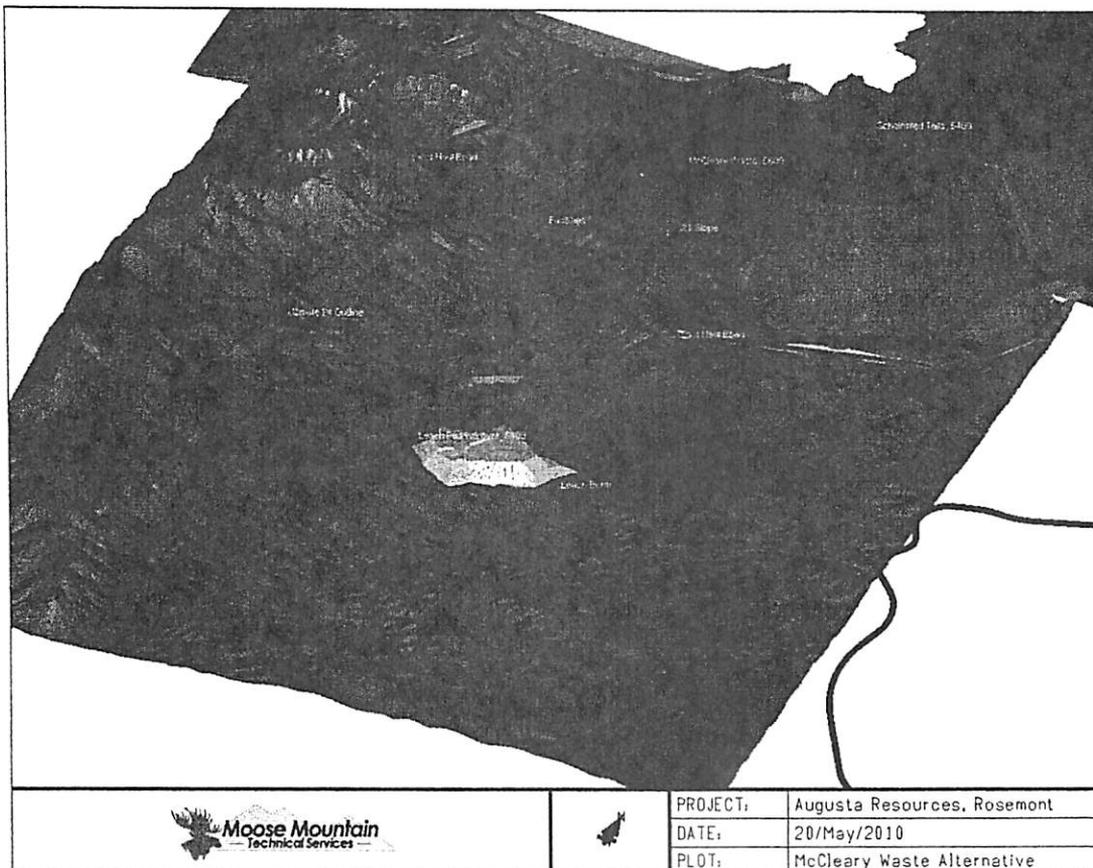
Common items:

- The first screenshot shows items that are common with the feasibility study plan
 - o Pit Outline, Facilities and access roads to the site
 - o Leach pile



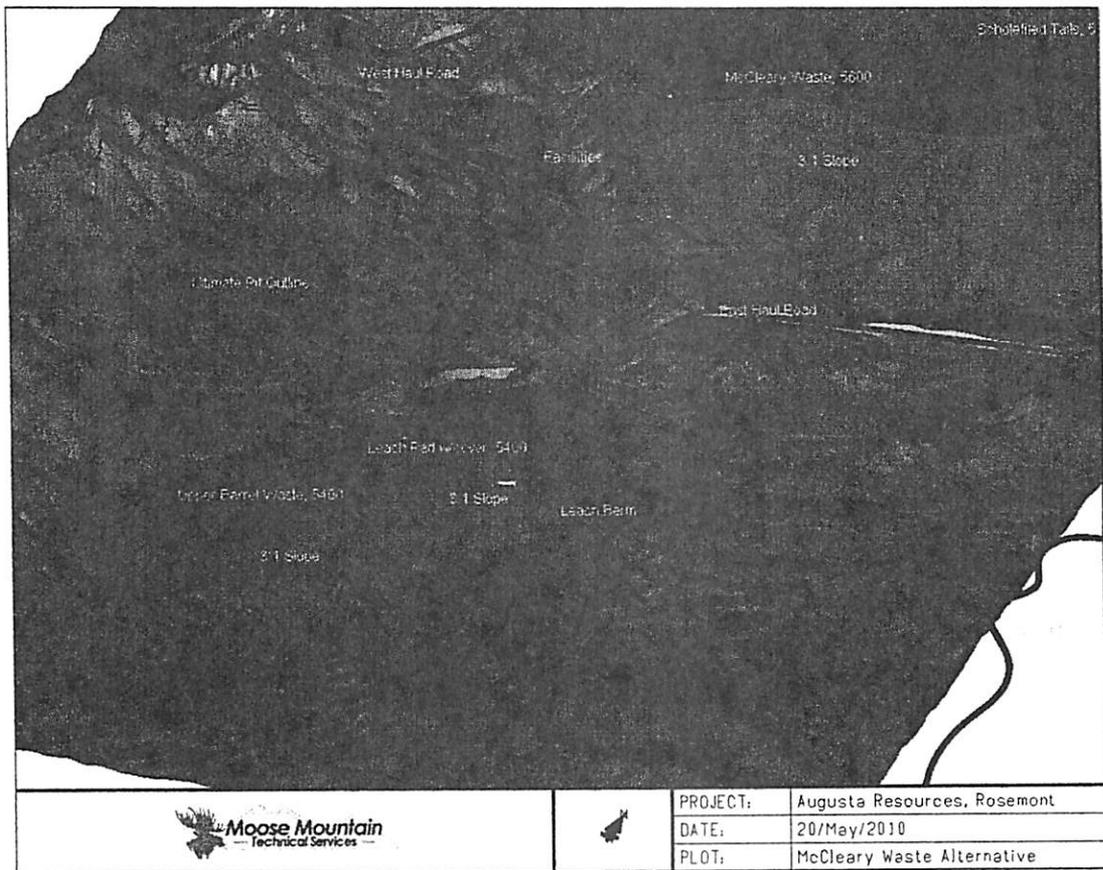
McCleary Waste Area to 5600 elevation:

- The third screenshot shows the McCleary waste area built up to the 5600 elevation.
- Slopes on this dump are designed at 3:1.
- No internal benches have been designed for this dump.
- No internal haul routes have been designed for this dump, but are assumed to fit within the structure.



Upper Barrel Waste Area to 5400 elevation:

- The fourth screenshot shows the Upper Barrel waste area built up to the 5400 elevation.
- Slopes on this dump are designed at 3:1.
- No internal benches have been designed for this dump.
- No internal haul routes have been designed for this dump, but are assumed to fit within the structure.
- This waste area caps the leach pile and contains any extra waste that will not fit within the McCleary area.



The following table shows the quantities of material in each designed waste and tails area:

Total waste in mining schedule = 1,232,308 ktons

Total tails produced from mining schedule = 378,858 kyd³

Item	Size (ktons)
West Road	3,390
East Road	1,308
Other Roads	1,000
Dry Stack Buttress	212,913
Leach Pad	2,500
Leach Berm Surface	1,189
Leach Cap	0
Leach Area Waste 5100	35,738
Leach Area Waste 5200	37,468
Leach Area Waste 5300	32,759
Leach Area Waste 5400	22,273
Upper Barrel Waste 5400	79,611
McCleary Area Waste 4900	37,314
McCleary Area Waste 5000	56,578
McCleary Area Waste 5100	88,359
McCleary Area Waste 5200	116,838
McCleary Area Waste 5300	139,237
McCleary Area Waste 5400	147,735
McCleary Area Waste 5500	126,655
McCleary Area Waste 5600	89,443

Item	Size (kyd ³)
Tailings in Scholefield	378,858

Estimating Additional Mining Capital and Operating for Each Waste option:

For each waste alternative, an estimate of the additional costs is put together. This is an estimate of all mining costs additional to the feasibility level estimate that would be incurred if either of these alternatives were to be implemented.

The additional costs would be due to overhauling waste rock from the mining pit. In the feasibility study all waste rock is placed in the Upper Barrel, and the tailings are built up in the Lower Barrel. In each of the alternatives the waste and the tailings will be placed further away. To estimate the additional waste hauling costs, a haul study is implemented.

Haul Study:

For each of these waste option, the capacities of the dumps are reported on 100 foot intervals. Rough haul profiles are generated from the mining pit exit to each dump and then each 100 foot lift on each dump. FPC (Caterpillar's Fleet Productivity and Cost software) is used to generate rough simulated haul cycle times to each dump location and the cycles are weight averaged to find the relative difference in hauling costs for each option.

The details behind following tables can be found in spreadsheet Rosemont May 2010 Waste Options, May 20, 2010'.

Average Cycle Times from Pit Rim to Destination

Waste Option	Weighted Average Cycle Time (min)
1	12.40
2	18.11
FS Base Case	10.51

The numbers in the table above are from the pit rim, and don't include the portion of the haul from the pit source to the pit rim, which would be common for all cases. Based on work done for the feasibility study, the average cycle time for the haulers from the pit source to the waste destination is 24.50 minutes. If the differences in the table above are added to this cycle time we get the following table.

Average Cycle Times from Pit Source to Destination

Waste Option	Weighted Average Cycle Time (min)
1	26.39
2	32.10
FS Base Case	24.50

Additional Hauler Hours from Feasibility Study for Waste Hauling:

Waste Option	Weighted Average Cycle Time (min)
1	7.7%
2	31.0%

In the feasibility estimate, there is a total of 2,044,744 hauler operating hours. Based on the adjusted waste dumping locations in the alternatives the following waste hauler operating hours can be estimated:

Hauler Hours for Waste Delivery:

Waste Option	Weighted Average Cycle Time (min)
FS Base Case	2,044,744
1	2,202,134
2	2,679,420

The following tables show a summation of the additional costs for each waste alternative:

For Option 1, Barrel and Trail Creek Waste:

Extra Hauler hours =	157,390
Cost per operating hour for haul truck =	\$330.00
Extra cost for Hauling Waste =	\$51,938,847
Estimated Extra Haulers =	3
Capital Cost per haul truck =	\$3,500,000
Extra cost for extra haulers =	\$10,500,000

Total Extra Mining Costs for Option 1 =	\$62,438,847
--	---------------------

For Option 3, Barrel and McCleary Waste, Scholefield Tails:

Extra Hauler hours =	634,676
Cost per operating hour for haul truck =	\$330.00
Extra cost for Hauling Waste =	\$209,442,951
Estimated Extra Haulers =	10
Capital Cost per haul truck =	\$3,500,000
Extra cost for extra haulers =	\$35,000,000

Total Extra Mining Costs for Option 2 =	\$244,442,951
--	----------------------



"Tom Furgason"
<tfurgason@swca.com>
07/07/2009 11:04 AM

To "Beverley A Everson" <beverson@fs.fed.us>, "Melinda D
Roth" <mroth@fs.fed.us>
cc "Melissa Reichard" <mreichard@swca.com>
bcc
Subject FW: Status of Chapter 3

FYi

From: Charles Coyle
Sent: Tuesday, July 07, 2009 11:02 AM
To: Tom Furgason
Subject: RE: Status of Chapter 3

Hi Tom,

Internal due date is this Friday, but I suspect we'll only get about half the sections then. Bev had given her team till tomorrow 7/8 to respond to the bounds of analysis, so that affects some. I've already received drafts of biological resources and air quality. Ryan Rausch sent his draft geology to Jerome, so that's where that one is. Public health and safety will be delayed somewhat by dependence on getting recreation and transportation finished. Ralph said he's about halfway with transportation. I don't know about hydrology (Rion B, Chris Garrett, and Dale)—haven't heard anything. Suzanne Griset is actively working on cultural; she just called. Socio will be delayed till we receive the ASU study. Can't say about status of any of the others right now.

Charles

From: Tom Furgason
Sent: Tuesday, July 07, 2009 10:39 AM
To: Charles Coyle
Subject: Status of Chapter 3

Charles,

What is the status of Chapter 3?

Tom



"Melissa Reichard"
<mreichard@swca.com>
10/01/2009 01:18 PM

To "Reta Laford" <rlaford@fs.fed.us>
cc "Tom Furgason" <tfurgason@swca.com>, "Beverley A
Everson" <beverson@fs.fed.us>, "Melinda D Roth"
<mroth@fs.fed.us>
bcc

Subject Rosemont Scoping Comment Attachments

Reta-

There were a number of attachments that were resolutions and/or writings by different govt entities (i.e. Pima County's resolution against the mine). The resolutions often list a number of concerns and potential effects. There were general tech memos sent from the County, for example, to different parties that list concerns as well.

How would you like these to be treated? Would you like those to be coded? If we code the attachments, should they be considered as comments from the original submission letter or do we need to set these up as new commenters?

Let me know what you think.
Thanks!

Melissa Reichard
Project Administrator
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520)325-9194, (520)325-2033 fax

Sound Science. Creative Solutions.

*"Man's mind, once stretched by a new idea, never regains its original dimensions."
-Oliver Wendell Holmes*

Reta Laford/R3/USDAFS
07/23/2009 02:05 PM

To Melinda D Roth/R3/USDAFS@FSNOTES
cc
bcc
Subject Next steps -Re: Letter still needed - Re: Need letter for Scoping Report #1

I accept the suggestion. Please have Tom edit document text and table of contents accordingly. I will be in Friday, and would like to visit with you on report 1 and 2. Will you be in? Please let Tom know that after you and I visit, I will contact him, also on Friday, to wrap up any loose ends on these reports. Hopefully I will be able to forward to RO after that.

Melinda D Roth

Called Tom. Thurs. pm.

*He also had a concern/idea about the
Project title: Rosemont Copper Project
an open-pit copper mine
in the Santa Rita Mts.*

— Original Message —

From: Melinda D Roth
Sent: 07/23/2009 01:19 PM MST
To: Reta Laford
Subject: Fw: Letter still needed - Re: Need letter for Scoping Report #1

ps. Tom suggested just referencing our review request in the narrative and including only the RO reply in the appendix as a way to address this problem.

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)
(520) 388-8305 (FAX)

— Forwarded by Melinda D Roth/R3/USDAFS on 07/23/2009 01:17 PM —



Melinda D Roth/R3/USDAFS
07/21/2009 01:23 PM

To Reta Laford/R3/USDAFS@FSNOTES
cc Reta Laford/R3/USDAFS@FSNOTES,
tfurgason@swca.com, Melinda D
Roth/R3/USDAFS@FSNOTES
Subject Re: Letter still needed - Re: Need letter for Scoping Report #1

We have looked high and low, including asking the RO, and it seems this memo never was finalized/signed. We could either use what we have - an undated/unsigned draft - or act like this memo never existed. The RO July 15, 2008 reply cover memo further confuses things because it refers to our request of June 6, 2008 in the memo subject line. Also, what Tom has appended in Scoping Report #1 doesn't include the Chronology table attached to the missing memo. Does it need to be included in Scoping Report #1? Soooooo, what do you want to do?

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)
(520) 388-8305 (FAX)



MODIFICATION OF GRANT OR AGREEMENT

PAGE	OF PAGES
1	1

1. U.S. FOREST SERVICE GRANT/AGREEMENT NUMBER: 07-CO-11030510-024	2. RECIPIENT/COOPERATOR GRANT or AGREEMENT NUMBER, IF ANY:	3. MODIFICATION NUMBER: 05
4. NAME/ADDRESS OF U.S. FOREST SERVICE UNIT ADMINISTERING GRANT/AGREEMENT (unit name, street, city, state, and zip + 4): Coronado National Forest 300 W. Congress Tucson, AZ 85701	5. NAME/ADDRESS OF U.S. FOREST SERVICE UNIT ADMINISTERING PROJECT/ACTIVITY (unit name, street, city, state, and zip + 4): Coronado National Forest 300 W. Congress Tucson, AZ 85701	
6. NAME/ADDRESS OF RECIPIENT/COOPERATOR (street, city, state, and zip + 4, county): Jamie Sturgess, Rosemont Copper Company 4500 Cherry Creek South Drive, Suite 1040 Denver, CO 80246	7. RECIPIENT/COOPERATOR'S HHS SUB ACCOUNT NUMBER (For HHS payment use only):	

8. PURPOSE OF MODIFICATION

CHECK ALL THAT APPLY:	This modification is issued pursuant to the modification provision in the grant/agreement referenced in item no. 1, above.
<input checked="" type="checkbox"/>	CHANGE IN PERFORMANCE PERIOD: In pursuant to D. 12 and D. 23 to extend the expiration date from 12/31/2010 to 12/31/2011.
<input type="checkbox"/>	CHANGE IN FUNDING:
<input type="checkbox"/>	ADMINISTRATIVE CHANGES:
<input type="checkbox"/>	OTHER (Specify type of modification):

Except as provided herein, all terms and conditions of the Grant/Agreement referenced in 1, above, remain unchanged and in full force and effect.

9. ADDITIONAL SPACE FOR DESCRIPTION OF MODIFICATION (add additional pages as needed):
The reason for the modification to extend the expiration date is to continue and complete the analysis of the NEPA project.

10. ATTACHED DOCUMENTATION (Check all that apply):

<input type="checkbox"/>	Revised Scope of Work
<input type="checkbox"/>	Revised Financial Plan
<input type="checkbox"/>	Other:

11. SIGNATURES

AUTHORIZED REPRESENTATIVE: BY SIGNATURE BELOW, THE SIGNING PARTIES CERTIFY THAT THEY ARE THE OFFICIAL REPRESENTATIVES OF THEIR RESPECTIVE PARTIES AND AUTHORIZED TO ACT IN THEIR RESPECTIVE AREAS FOR MATTERS RELATED TO THE ABOVE-REFERENCED GRANT/AGREEMENT. ~

11.A. SIGNATURE	11.B. DATE SIGNED	11.C. U.S. FOREST SERVICE SIGNATURE	11.D. DATE SIGNED
(Signature of Signatory Official)		(Signature of Signatory Official)	
11.E. NAME (type or print): JAMIE STURGESS		11.F. NAME (type or print): JIM UPCHURCH	
11.G. TITLE (type or print): Rosemont Copper Company		11.H. TITLE (type or print): Forest Supervisor	

12. G&A REVIEW

12.A. The authority and format of this modification have been reviewed and approved for signature by:	12.B. DATE SIGNED
<div style="border-top: 1px solid black; margin-top: 10px;"> ANDREA G. SEPULVEDA U.S. Forest Service Grants & Agreements Specialist </div>	

**INSTRUCTIONS FOR FORM FS-1500-19**

1. Enter the original U.S. Forest Service agreement number.
2. Enter the cooperator's agreement number, if applicable.
3. Enter the number for this Modification, i.e. 01, 02, or 03. The first modification to an instrument is '01', subsequent modifications receive a subsequent modification number (for example, the fourth modification is '04').
4. Enter the address of the G&A Specialist/Signatory Official responsible for this agreement.
5. Enter the address of the U.S. Forest Service Program/Project Manager or Lead Scientist responsible for this agreement.
6. Enter the cooperator's address.
7. Enter the cooperator's HHS Sub-Account numbers, if funding is provided on this modification (for example: G2412345003) (Only used by NA/S&PF and NRS)
8. Select all boxes that apply:
 - Change in Performance = updated performance period agreed to.
 - Change in Funding = obligation OR de-obligation amount and new totals.
 - Administrative = change in pay address, administrator address, correcting typing errors, etc.
 - Other = any other modification not described, such as update new objective to study plan, change the Principle Investigator, etc.
9. Insert changes such as updated provision, tasks, or any other data needed by the modification, add additional pages as needed.
10. Check all boxes that apply and ensure to attach these documents to the modification. Other attachments could include SF-424 forms.
11. A – D, self explanatory.
11. E – H, Type or print the names of signatory officials.
12. G&A Specialist signs and dates before sending to the individuals in block 11, if all modification data are approved for signature.

Burden Statement

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0217. The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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Reta Laford/R3/USDAFS
09/01/2009 09:58 AM

To Melinda D Roth/R3/USDAFS@FSNOTES
cc Reta Laford/R3/USDAFS@FSNOTES, Beverley A
Everson/R3/USDAFS@FSNOTES, Teresa Ann
Ciapusci/R3/USDAFS@FSNOTES, "Tom Furgason"
bcc

Subject Rosemont - Laford's issue development paper review next
week.

History:  This message has been replied to.

Mindee - Upon my return, I want to review draft Scoping Report 3 and the issue development process/status. Could you coordinate getting me paper copies of the issue development process stuff such as IDT mtg notes, SWCA/FS meeting notes, etc. (Note that I already have a copy of the issue presentation notebook so I do not need another.) I will use next week for the review and follow-up discussions with hopes of being able to support a final list to Jeanine the following week. Thx

Reta Laford, Deputy Forest Supervisor

USDA Forest Service, Coronado National Forest
300 W Congress Street, Tucson, AZ 85701

Phone: 520-388-8307 (office), 505-452-7557 (cell)
Fax: 520-388-8305
Email: rlaford@fs.fed.us

INTEROFFICE MEMORANDUM

TO: TOM FURGASON - SWCA
FROM: TERESA ANN CIAPUSCI
SUBJECT: ROSEMONT COPPER PROJECT – CONTENT ANALYSIS
DATE: 05/21/2008
CC: BEV EVERSON - PROJECT LEADER

Tom –

Please use the following protocols to guide your content analysis team with comment coding and reporting for the Rosemont Copper Project. This direction is guidance only and may be incorporated to the extent practicable into the databases and reporting structures you have already developed. Any questions, please feel free to contact me.

I reviewed the coding structures for a couple of past projects I've worked on. Following is a typical coding structure – it may be helpful to cross check with your structure for completeness.

1) Planning/Decision-making Processes

- a) Decision-making Process and Methods
 - i) Adequacy of collaboration with other agencies
 - ii) Trustworthiness and integrity of the decision-making process
 - iii) Use of best available science
 - iv) Adequacy of analysis procedures
 - v) Adequacy of entire project timeline
- b) Public Involvement
 - i) Adequacy of agency communication
 - ii) Information availability
 - iii) Adequacy of timeframe for comment
 - iv) Adequacy of comment period
 - v) Comment period running through holiday period
 - vi) Adequacy of public comment forums
 - vii) Availability of public comment forums
- c) Consistency with Federal Law, Regulation, and Policy
 - i) *This section is enumerated by each relevant law, regulation (CFR), or policy (FSM/FSH/policy letters), executive orders, and case law citations specific to the project or proposal*
 - ii) *Lists in this section tend to be extensive*
- d) Consistency with other Planning and Management Processes
 - i) Land and resource management plan consistency
 - ii) Healthy Forest Initiative consistency
 - iii) National Fire Plan consistency
 - iv) State and local planning process (*again extensive lists of applicable citations*)

2) Natural Resource Management and Effects Analysis

- a) Physical Resources – effects
 - i) Water resources

- ii) Water quantity
 - iii) Water quality
 - iv) Municipal and drinking water
 - v) Soils
 - vi) Site productivity
 - vii) Erosion and landslides
 - viii) Air resources
 - ix) Climate change
 - b) Minerals and Geology – effects (includes existing and future leasing)
 - i) Minerals and geology
 - ii) Locatable minerals
 - iii) Leaseable minerals
 - (1) Energy minerals
 - (a) Oil
 - (b) Gas
 - (c) Coal
 - iv) Salable minerals
 - v) Abandoned and inactive mines
 - vi) Geological resources
 - vii) Paleontological resources
 - viii) Cave resources
- 3) Biological Resources and Effects Analysis**
- a) Forest health and ecology – effects
 - i) Timber
 - ii) Forest health
 - iii) Fire ecology
 - iv) Fuels management
 - (1) General
 - (2) WUI, CWPP
 - v) Fire suppression
 - vi) Burned area emergency rehabilitation (BAER)
 - vii) Insects
 - viii) Disease
 - b) Biodiversity – effects
 - i) Biodiversity
 - ii) Fragmentation
 - iii) Habitat and species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species
 - (6) Terrestrial plant habitat
 - (7) Terrestrial plant species
 - iv) Threatened species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species

- (6) Terrestrial plant habitat
- (7) Terrestrial plant species
- v) Endangered species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species
 - (6) Terrestrial plant habitat
 - (7) Terrestrial plant species
- vi) Proposed species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species
 - (6) Terrestrial plant habitat
 - (7) Terrestrial plant species
- vii) Candidate species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species
 - (6) Terrestrial plant habitat
 - (7) Terrestrial plant species
- viii) Sensitive species
 - (1) General
 - (2) Terrestrial animal habitat
 - (3) Terrestrial animal species
 - (4) Aquatic animal habitat
 - (5) Aquatic animal species
 - (6) Terrestrial plant habitat
 - (7) Terrestrial plant species
- ix) Reference landscapes
- c) Vegetation Resources
 - i) Grazing
 - ii) Non-timber forest products
 - iii)
- 4) **Social Resources and Effects**
 - a) Recreation Management
 - i) Recreation opportunities
 - (1) Dispersed recreation
 - (a) Special uses – dispersed recreation activities
 - (2) Developed recreation
 - (a) Special uses – developed recreation activities
 - (b) Special uses – road based recreation activities
 - ii) Scenic quality
- 5) **Lands, Special Designations, Transportation**
 - a) Real estate management

- b) Roadless Areas
- c) Access to non-Federal ownership
 - i) Private inholdings
 - ii) Public facilities
- d) Non-recreation special uses
 - i) Utility corridors
 - ii) Communication sites
- e) Wilderness
- f) Other special designations
 - i) Wild and Scenic Rivers
 - ii) Research Natural Areas
 - iii) Biological Areas
 - iv) Paleontological Areas
 - v) Geological Areas
 - vi) Zoological Areas
 - vii) Traditional cultural properties
- g) Heritage Resources
- h) Roads Management (non-resource specific)
 - i) Road construction, reconstruction, and maintenance
 - ii) Road closures
 - iii) Temporary Roads
- 6) **Socio-Economic Resources**
 - a) Social and economic factors
 - b) Non-commodity values
 - c) Ranching economy
 - d) Timber economy
 - e) Wood products industry
 - f) Minerals industry
 - i) Energy minerals sector
 - ii) Other minerals sector
 - g) Ability to provide transportation systems
 - h) Forest-dependent communities
 - i) American Indians and tribes
 - j) Civil Rights
 - k) Environmental justice
 - l) Health
 - i) Public
 - ii) Employee
 - m) Safety
 - i) Public
 - ii) Employee
- 7) Attachments
 - a) *(Includes any additional materials provided by the commenter)*
 - b) *(I spoke with Harmony about ways to track these materials including scanning, copying, and taking digital photographs that can be attached to the associated comment record)*

In my conversation with Harmony today, I learned she needed some coding protocols for attachments and other logging anomalies. The following chart is based on a compilation of charts from other projects I've worked on:

REMARK	EXPLANATION
/s/	Indicates response was signed by someone other than the author
1 of (x) orgs	Indicates the number of organizations attaching themselves to a particular response
1 of (x) signatures	Indicates the number of signatories attached to a particular response
After comment period	Used for comment documents that are received after the closing date specified in the <i>Federal Register</i>
Anonymous	Indicates term used in the Last Name field when respondent's name and address are not supplied or are illegible
Community meeting	Indicates the respondent's comments were made at a community meeting
Oral	Indicates respondent's comments are contained in the speaker transcript of a public hearing
Duplication of letter #x	Indicates a response that is an exact duplicate or a response sent earlier by the same person
Duplication #x	Indicates the number of duplicates with no letter number issue
Form master #	Indicates this response form has been designated as the "model" for a particular form
Hand delivered	Indicates the form was hand or courier delivered (not postal mail, fax, or electronic mail)
Illegible	Indicates all or part of a respondent's name or address field is illegible
Mailing list only	Indicates a response with no comments to code, but contact information is retained on the mailing list
Remove mail contact	Indicates a request to be removed from the contact mailing list
No signature	Indicates the response was unsigned
Outside of scope	Indicates a comment that is outside the scope of the proposed action, purpose and need
Missing pages	Indicates that one or more pages are missing – remarks should specify missing page numbers
Petition	Indicates a response that specifies it is a petition or a response that contains 5 or more individual signatures
Stage of Process	Indicates the stage of process the proposal is in (e.g. scoping, DEIS)
Unused identifier	Indicates the comment identifier number was skipped or not used – specify reason in remarks

Finally, Harmony and I also discussed reasons for sending me or Bev early alerts related to comment letters. The following list contains the "red flag" items I suggested in our conversation:

- Threat of harm
 - Any response that threatens physical harm to the project (ecoterrorism) or persons working on the project (agency, contractor, proponent)
- Notice of appeal or litigation
 - Any response that describes intent to appeal an action or bring legal suit to bear on the agency
- Freedom of Information Act (FOIA)
 - Any response that officially requests information and documentation under FOIA
 - Any response that appears to have FOIA implications, even if there is not a direct reference to FOIA
- Proposals for additional alternatives and mitigation options
 - Any response that discusses a proposal for an additional alternative
 - Any response that proposes potential mitigation for known alternatives or effects
- Detailed review needed
 - Any response that requires detailed review
 - Responses that include detailed attachments such as maps, literature, detailed scientific analyses, or similar
 - Responses that suggest extensive technical edits, additions, deletions, or replacements
- Government entities
 - Any response from an elected official, writing in his or her official capacity, from federal, tribal, state, county, or municipal governments
 - Official correspondence from any government agency

~ Teresa Ann

I will be on vacation next week (camping on the North Rim), but Jonathan and Melissa can assist you with the change order, if appropriate. Thank you.

Tom

From: Melinda D Roth [mailto:mroth@fs.fed.us]
Sent: Thursday, October 07, 2010 2:40 PM
To: Sarah L Davis
Cc: Beverley A Everson; Tom Furgason; Jonathan Rigg; tjchute@msn.com
Subject: Fw: Dark Skies Report Review

FYI. Sarah please review, work with SWCA to address/incorporate Smithsonian comments, and keep Bev apprised of any major issues. Thx.

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)
(520) 388-8305 (FAX)

----- Forwarded by Melinda D Roth/R3/USDAFS on 10/07/2010 02:33 PM -----

"Dan Brocious" <dbrocious@cfa.harvard.edu>

10/07/2010 02:01 PM

Please respond to
<dbrocious@cfa.harvard.edu>

To

mroth@fs.fed.us

cc

falco@cfa.harvard.edu

Subject

Re: Dark Skies Report Review



Reta Laford/R3/USDAFS
01/31/2010 08:50 PM

To Melinda D Roth/R3/USDAFS@FSNOTES, Beverley A
Everson/R3/USDAFS@FSNOTES, tfurgason@swca.com
cc mreichard@swca.com

bcc

Subject Record Review Findings

I am pleased to share the results of three hours I spent Saturday with Melissa reviewing the record. My review found public materials such as Federal Register notices and News Releases, including the corresponding distribution listed, were included. Congressional correspondence was also included. The review however profiled the need for me to provide sole-proprietor information such as my Open House and Public Meeting speech notes. Overall the review was beneficial in confirming key items were included as well as items I had overlooked providing. As a follow-up, I will be providing SWCA supplemental materials in my possession that I do not believe they may have.

Reta Laford, Deputy Forest Supervisor

USDA Forest Service, Coronado National Forest
300 W Congress Street, Tucson, AZ 85701

Phone: 520-388-8307 (office), 505-452-7557 (cell)
Fax: 520-388-8305
Email: rlaford@fs.fed.us



"Melissa Reichard"
<mreichard@swca.com>
12/23/2009 10:48 AM

To "Teresa Ann Ciapusci" <tciapusci@fs.fed.us>, "Sarah L
Davis" <slidavis@fs.fed.us>, "Melinda D Roth"
<mroth@fs.fed.us>
cc "Beverley A Everson" <beverson@fs.fed.us>, "Tom
Furgason" <tfurgason@swca.com>, "Reta Laford"
<rlaford@fs.fed.us>, "Melissa Reichard"
bcc

Subject Record questions

All-

I began submitting these questions quite some time ago and still have not heard an answer on most of them. I have made note of all of the answers that I have decided to go with. Frankly, I can't wait for answers given my current timeline. I have a number of other decisions that have been made to fill in the gaps of the guidance. If you would like them, let me know.

Also, the biggest outstanding piece is references. The guidance leaves out this section entirely, other than it being listed in the schema. I will need to know, in writing, what and how-specifically- you want documented pertaining to references. Which documents do you want references documented from? I should also note that this section will not be able to meet our current timeline. It could take months to compile this documentation outside of the current record project.

I also have not heard back on what the expectations are from SWCA pertaining to the resource documentation. We will need to discuss anything required of us other than receiving documents from the appropriate *specialists* to represent the work done for their resource.

I look forward to hearing your thoughts!
I hope you all have a nice holiday!

Melissa Reichard
Project Administrator
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520)325-9194, (520)325-2033 fax

Sound Science. Creative Solutions.

"Man's mind, once stretched by a new idea, never regains its original dimensions."



-Oliver Wendell Holmes Record Question & Requests Tracking 122309.pdf



"Hattenbach, Steve"
<STEVE.HATTENBACH@OG
C.USDA.GOV>

07/21/2010 03:45 PM

To "Blaine, Marjorie E SPL"
<Marjorie.E.Blaine@usace.army.mil>, "Melinda D Roth"
<mroth@fs.fed.us>
cc "Brian Lindenlaub" <blindenlaub@westlandresources.com>,
"Reta Laford" <rlaford@fs.fed.us>, "Tom Furgason"
<tfurgason@swca.com>

bcc

Subject RE: Rosemont

I am currently available on August 3rd 1 p.m. Mountain Time or later, and all day the 4th and 5th.

Steve Hattenbach
USDA, OGC
P.O. Box 586
Albuquerque, NM 87103-0586
phone (505) 248-6020
fax (505) 248-6013

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-----Original Message-----

From: Blaine, Marjorie E SPL [mailto:Marjorie.E.Blaine@usace.army.mil]
Sent: Wednesday, July 21, 2010 4:40 PM
To: Melinda D Roth
Cc: Brian Lindenlaub; Reta Laford; Tom Furgason; Hattenbach, Steve
Subject: RE: Rosemont

Mindee:

Thank you. We'd like to keep it simple. So I just need the date and time in those three days that is best for him and our attorneys will work that into their schedules since Mr. Hattenbach has more constraints. Once he gives us that, then we'll set up a conference call-in number for him. As far as prework, if you all want to brief him, that's fine but our attorneys are aware of the issues. Participants would be three of us and hopefully just a few of you like Mr. Hattenbach, you, and Reta. I'll set up the topics/agenda once we have the date. So all I need from you/him is the date and time on one of those days that is the most convenient for him. I am expecting this will take no more than an hour at the most.

Thank you!

Marjorie

Assist us in better serving you!

You are invited to complete our customer survey, located at the following link: <http://per2.nwp.usace.army.mil/survey.html>

Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----

From: Melinda D Roth [mailto:mroth@fs.fed.us]
Sent: Wednesday, July 21, 2010 3:36 PM

To: Blaine, Marjorie E SPL
Cc: Brian Lindenlaub; Reta Laford; Tom Furgason;
STEVE.HATTENBACH@OGC.USDA.GOV
Subject: Re: Rosemont

Right now, Steve Hattenbach, our OGC attorney in Albuquerque, is available August 3, 4, or 5, although he has a heavy caseload and is expecting court schedules to start filling in over the next 2 weeks. It might be best to put the attorneys in direct communications to work out the schedule, logistics, prework, participants, topics, agenda, etc.

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)
(520) 388-8305 (FAX)

"Blaine, Marjorie E SPL" <Marjorie.E.Blaine@usace.army.mil>

07/21/2010 11:54 AM To
"Melinda D Roth" <mroth@fs.fed.us>, "Reta Laford" <rlaford@fs.fed.us> cc "Tom Furgason" <tfurgason@swca.com>, "Brian Lindenlaub" <blindenlaub@westlandresources.com>
Subject
Rosemont

Mindee and Reta

I left messages for you both but will send you a quick email.

I met with our attorneys this morning. Our chief attorney is a NEPA and a takings expert and our regulatory attorney is a NEPA and regulatory expert. They contend that NEPA requires the USFS to look at offsite alternatives...NEPA does not get into takings. So while your decision in the end "might" be limited by takings considerations, NEPA still requires you to look at the full array of alternatives including the alternative mineral resources proximal to the Rosemont ore body and other offsite alternatives. They would be most happy to have this discussion with your attorneys and wonder if we can schedule this for either August 3, 4, or 5th...a telecon is probably the best.

To that end, they have advised me that, until this is settled and agreed upon, we cannot participate in any meetings regarding mitigation, etc. so I will not be in the call today.

Finally, I did a quick look at the revision of Chp 1 and find it to be really problematic as did our attorney. I will be giving you comments but your purpose and need are still very unclear and our comments were not appropriately incorporated. Again, I'll provide you our detailed comments next week as promised.

I look forward to your call or email confirming one of those dates for our attorneys and us to meet.

Thank you very much.

Marjorie Blaine
Senior Project Manager/Biologist
U.S. Army Corps of Engineers
Tucson Project Office, Regulatory Division
5205 E. Comanche Street
Tucson, AZ 85707
(520)584-1684 (phone)
(520)584-1690 (fax)

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Kathy Arnold
<karnold@rosemontcopper.com>

10/08/2009 01:28 PM

To Reta Laford <rlaford@fs.fed.us>

cc Melinda D Roth <mroth@fs.fed.us>

bcc

Subject FW: FYI: Pima County Flood control visited Rosemont today

History:

 This message has been replied to and forwarded.

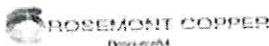
Reta –

I wanted to see if you were aware of this and if Pima County Flood Control is really representing the Forest Service. Can you let me know?

Thanks -

Kathy

Kathy Arnold | Director of Environmental and Regulatory Affairs
Cell: 520.784.1972 | Main: 520.297.7723 | Fax 520.297.7724
karnold@rosemontcopper.com



Rosemont Copper Company
P.O. Box 35130 | Tucson, AZ 85740-5130
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From: Jeff Cornoyer

Sent: Thursday, October 08, 2009 1:16 PM

To: Rod Pace; Fermin Samorano; Kathy Arnold; Jamie Sturgess

Cc: Holly Lawson; Dennis Fischer

Subject: FYI: Pima County Flood control visited Rosemont today

All:

Late this morning Pima County Flood control was at the Mine sight. Dennis first observed them at the old smelter site photographing the road surface and the scrapers driving by. At the time they didn't identify themselves and were driving a white suburban with regular plates. Later they tried to gain entry to the upper test plot site claiming they had permission from the Forest Service. Oscar was at the gate and told them he would have to check with his supervisor to allow them in. They didn't pursue it and drove away, but mentioned they were interested in seeing containment at the bottom of the plots. Nothing further from them today.



Jeff Pima Flood.pdf

Pima County Regional
FLOOD CONTROL
DISTRICT



DR. GREG SAXE, M.R.P.
ENVIRONMENTAL PLANNING MANAGER
PLANNING & DEVELOPMENT DIVISION
REGIONAL FLOOD CONTROL DISTRICT

97 E. CONGRESS STREET, 2ND FLOOR
TUCSON, ARIZONA 85701-1797

PHONE: (520) 243-1800
FAX: (520) 243-1821
greg.saxe@rfdc.pima.gov

Debby Kriegel /R3/USDAFS
06/01/2010 07:30 AM

To "Marcie Bidwell" <mbidwell@swca.com>, Melinda D
Roth/R3/USDAFS@FSNOTES, Beverley A
Everson/R3/USDAFS@FSNOTES, Reta
cc Debby Kriegel/R3/USDAFS@FSNOTES
bcc
Subject Rosemont Simulations - Drainage Drawings 

Bev, Mindee, Reta: Note Marcie's statement below (I turned her text red). If she doesn't have the data from Rosemont by June 15, she won't be able to produce simulations for the DEIS. I believe that this is a major problem.

Marcie: Please verify with Rosemont and Tetra Tech the correct number of benches to show in the simulation. I'm confused by items 1 (no benches on tailings) and 2 (6 benches). Which is correct for the MPO?

"Marcie Bidwell" <mbidwell@swca.com>



"Marcie Bidwell"
<mbidwell@swca.com>
05/28/2010 09:16 AM

To "David Krizek" <david.krizek@tetrattech.com>, "Kathy
Arnold" <karnold@rosemontcopper.com>
cc "Debby Kriegel" <dkriegel@fs.fed.us>, "Keepers, Ashley"
<Ashley.Keepers@tetrattech.com>, "Carrasco, Joel"
<Joel.Carrasco@tetrattech.com>, "Trent Reeder"
<treeder@swca.com>, "Melissa Reichard"
<mreichard@swca.com>, "Jonathan Rigg"
<jrigg@swca.com>, "Lara Mitchell" <lmitchell@swca.com>
Subject RE: Drainage drawing

David,

Good to see you on Monday. You looked refreshed.

Per Kathy's email regarding stormwater, here is an example of what we are looking for as an indication of stormwater elements- we just need to just know a general indication of where to show drop structures, detention ponds, etc. This could be hand drawn, or as Trent prepared similar to this diagram. This is to illustrate what we are requesting.

In the meeting May 19, the MPO was discussed, and it was decided that while several concepts for reclamation were included in the MPO that have different physical forms (such as ridge and valley, etc) that the EIS simulations will use the basic topography that Rosemont has provided the FS and SWCA. Additionally, SWCA will apply vegetation and colors to the surface, but we will not be adjusting the contours. The idea is that the "MPO is the MPO" to the level designed, not to show possible modifications to it.

REQUEST:

1. **Please indicate by June 3 if Trent's drawing for placement of drop structures and stormwater ponds will suffice.** At that date, we will complete the drafts of the MPO as Trent has shown. Or you may supply a similar drawing by June 3rd to replace it.

2. Please supply a similar level of drawing for the Scholefield and Barrel Only alternatives with the contours, when they are ready.

3. Any data that has been requested and **not received by June 15th** will not be shown in the DEIS simulations by SWCA, unless special arrangements have been made prior to this date.

A few important points regarding the MPO, drainage, and contours~

1. MPO Contours data set and reclamation- SWCA has been directed to use the set of contours for our alternatives that are shown in the JPG that is attached (August 2009 and Feb 2010 data downloads). However we do also have the 2007 contours shown in Figure 23 Reclamation Plan as well. There are differences between these data sets, although their footprints are mostly the same. Notice also that Figure 23 does not show benches or access roads. JPG shows three benches on the waste rock pile and no specific benches on the tailing pile; the tails are generally evenly stepped throughout.

Important note: we are proceeding with the data set shown in JPG, as recently directed, unless we hear otherwise by June 3.

2. MPO vs. Reclamation data set. Thus far, SWCA has been using the MPO footprint as shown in the maps used at Monday's meeting.

I know that you are very familiar with the MPO and its Reclamation Plan and you will notice that the contours that we have received for the MPO do not look quite like MPO Rec Figure 23 (compared with the contours shown in MPO SW mdb.jpg). The MPO JPG shows 3-4 benches in some places, but according to your Preliminary Stormwater Concept, there should be 1 bench per 100 feet of elevation on the waste rock, or 4-6 benches depending on where one starts counting.

Important note: we are proceeding with the MPO shown benches on the waste rock and assigning a bench to every 100ft of drop on the tails, which results in 6 benches (approximately), as directed May 19th unless we hear otherwise by June 3.

Thank you for your time and cooperation in advance,
Marcie

From: Marcie Bidwell
Sent: Wednesday, May 19, 2010 4:08 PM
To: 'Kathy Arnold'; David Krizek
Cc: Debby Kriegel; Keepers, Ashley; 'Carrasco, Joel'; Trent Reeder
Subject: RE: Drainage drawing

Hello David,

This request forwarded by Kathy is the conceptual drawing that you and I have been discussing for a few months now.

The request is to supplement the *Preliminary Stormwater Control and Reclamation Summary* with a conceptual sketch of where the elements described in the text would be placed on each alternative map. This is consistent with the data requests filed by the Forest Service this year.

Specifically, it would be for the following alternatives (i.e. Phased Tailings is considered complete):

- MPO-
- Upper Barrel- (once the final design is confirmed)
- Scholefield- (once final design is confirmed)

Additionally, SWCA would like to request that the Phased Tailings Contour data and associated layers be uploaded to the FTP site, as well.

I would be glad to discuss this on the phone with you, Ashley or Joel. And I want to extend a thank you for the recent call inquiry.

Thank you!

Marcie

From: Kathy Arnold [mailto:karnold@rosemontcopper.com]

Sent: Wednesday, May 19, 2010 2:46 PM

To: David Krizek

Cc: Marcie Bidwell; Debby Kriegel

Subject: Drainage drawing

David -

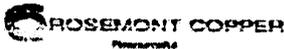
I need you to put pen to paper on a drawing (2-d is fine) to show Marcie what your write-up will (could?) look like in the real world. Hand drawn arrows will be fine.

Cheers!

Kathy

Katherine Ann Arnold, P.E. | Director of Environmental and Regulatory Affairs
Cell: 520.784.1972 | Main: 520.297.7723 | Fax 520.297.7724

karnold@rosemontcopper.com



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[attachment "MPO_SW mdb.jpg" deleted by Debby Kriegel/R3/USDAFS] [attachment "MPO Rec Figure 23.pdf" deleted by Debby Kriegel/R3/USDAFS]

Debby Kriegel /R3/USDAFS
06/10/2010 08:05 AM

To Larry Jones/R3/USDAFS@FSNOTES, Melinda D
Roth/R3/USDAFS@FSNOTES, Beverley A
Everson/R3/USDAFS@FSNOTES

cc

bcc

Subject Re: DEIS schedule and specialist reports for biology 

History:  This message has been forwarded.

Larry: Great letter!

Mindee and Bev: I feel exactly the same way. IDT members and SWCA resource specialists need to focus our efforts on getting the needed specialist work done and specialist reports completed. Writing DEISs without specialist reports and reviewing incomplete DEISs is a waste of our limited time. Would it be useful for others to put similar letters in the record? If so, I'd be happy to do one. Please let me know.

Thanks.

Larry Jones/R3/USDAFS

Larry Jones /R3/USDAFS
06/10/2010 07:38 AM

To Beverley A Everson/R3/USDAFS@FSNOTES, Melinda D
Roth/R3/USDAFS@FSNOTES
cc mreichard@swca.com

Subject DEIS schedule and specialist reports for biology

Mindee and Bev--

Following up on some discussions from yesterday's ID team meeting and some concerns we expressed. See attached. Melissa...please put in project record under usual spot (Biological Resources, or similar). Thanks! FYI, I'm meeting with Teresa Ann this morning for the Forest Plan compliance task. I met before, but some follow up is still needed.

Thanks!



Document flow for Biology reports and DEIS RCC proposal.pdf

Larry Jones
Wildlife, Fish, and Rare Plants
Coronado National Forest
300 W Congress
Tucson, AZ 85701

520-388-8375
ljones02@fs.fed.us

Hi Bev and Mindee--

6/10/2010

As a follow-up to today's interdisciplinary team meeting for the proposed Rosemont Copper Mine project, I am expressing some concerns about the DEIS timeline and how it relates to information availability and the necessary documents that are typically the foundation of the DEIS.

Biologists need to produce several documents to be in compliance with the National Forest Management Act, Endangered Species Act, Migratory Bird Treaty Act, Executive Order 13186, Bald and Golden Eagle Protection Act, and associated laws, regulations, and policies. These documents also serve as information sources for the DEIS effects analyses on the alternatives. The required documents are the Biological Evaluation, Migratory Bird Report, Management Indicator Species Report, and Biological Assessment (this can be a draft prior to DEIS because it needs to have a preferred alternative selected before Section 7 consultation can occur). The documents are to be produced by SWCA, reviewed by the Forest Service, and approved by the Forest Service.

Because of the magnitude and complexity of the proposed project, and because we are taking the lead for other agencies, I requested another report be produced, "Biologist report on the affected environment and identification of species for effects determinations. This document "sets the stage" for the others, and is a necessary precursor. Thus, this is the first of five biology specialist reports to be completed by SWCA. I have rough drafts of all of these reports, but there is much work to do on all to bring them up to the standards I expect for such a large, complex, and controversial project. Because of the perceived controversy, I think it behooves us to make these reports the most complete and accurate possible so that they are defensible in court, using the best available science, and considering all potential effects within the potential bounds of analysis.

In order to do these reports, it is important to have several components available for effects analyses, such as species surveys, water table analyses, and most importantly, accurate descriptions of alternatives selected to be carried forward into analysis (accurate maps and acres of disturbed area). Along those lines of examples, surveys for a Forest Service Sensitive Species (*Hexalectris colemanii*) are being conducted now, so we only know some of the results. The water table analyses have not been completed yet (these are critical to determining effect to many species). Alternatives to be carried forward have only recently been selected, and there is still one potential alternative ("landforming") that may still come forward. Accurate maps of the footprints are not yet available, and the utility corridors and other specifics of ancillary connected actions are still unknown.

I know that there has recently been an "extension" of the due date of a "final" DEIS (August), but I was told Chapter 3 of the DEIS was to be finalized by SWCA Monday (6/14/2010)...and today is Wednesday (6/9/2010). I met with Geoff Soroka (SWCA) yesterday (6/8/2010) to go over the all-important first biologist report, which will set the stage for the other documents and which will have extremely useful information for the DEIS, but that is when I heard he cannot work on it because the DEIS was due Monday.

My recommendation is that we not spend our time and SWCA's working on the DEIS (at least the affected environment information in Chapter 3) until we get the informational precursors together. As I understand it, the natural flow for NEPA- and NFMA- related procedures should be something like (for my specialty), in this order: (1) proposed action, (2) public scoping, (3) identification of significant issues, (4) information gathering, (5) alternative development, (6) alternative selection (those to carry forward into analysis), (7) information gathering, (8) specialists reports with effects determinations by alternative and/or preferred alternative, and (9) DEIS...then on to the post-DEIS processes.

As far as I can tell, we are pretty much caught up to number 3 and mostly 4, but 5 should be completed to the level necessary for effects analyses. There are uncertainties with 6 (connected actions and "landforming alternative"). Some of 7 has been completed, but from my resource, critical information is lacking for the groundwater report (and Salek's interpretation) and the orchid surveys (to be finished by end of June). When these are in place, we are ready to proceed to 8 (starting with the affected environment report) and then on to 9.

As mentioned earlier, we have drafts of the five reports, based on what we knew at the time, but they need considerable work, so I recommend we put our efforts into closing the gap on the information needs and finishing these reports before writing Chapter 3 of the DEIS.

I am writing this because I do not want anyone to think I have not been diligently working on the proposed Rosemont Copper Project--I am feeling extremely rushed to produce a sound Chapter 3 in the DEIS before we have even completed *any* of the biology specialist reports, which should be the source of information and effects determinations for the DEIS. Also, we were asked to have effects determinations for the MPO on June 15, which is only a few days away, so that is completely impossible (those will be in specialist reports). This project has been my highest priority, and I am honestly using the programmed days when charging to Rosemont. I could "cut corners" and approve documents that I am not satisfied with, but when my name goes on a document as an approver of a project of this magnitude, I want to make sure my reputation is intact and the Forest Service has covered all of its bases. I am doing the best I can do juggle this and other priorities and program of work expectations, but I fear that is not achievable in the timeline, especially if we continually write, rewrite, and retrofit text in the DEIS. I understand this project may be guided more by politics than conventional means, and you have to do what you have to do, but I feel I need to cover myself in the project record by explaining the inherent difficulties I have trying to meet the ambitious timeline.

Thanks.

--Larry Jones

Rosemont Copper Project
Mitigation Review

1.13.2010

Ben Everson	Coronado NF
Chuck Blair	Coronado NF
Debby Kriegel	Coronado NF
Jamie Sturgess	Rosemat Copper
Kathy Arnold	Rosemont
Mary Farrell	Coronado NF
Jonathan Rigg	SWCA
Mindee Roth	Coronado NF
Tami Jo Emmett	CNF-Lands
Larry Jones	CNF
SAEK SHAFIQUAH	CNF
Reta Laford	CNF

1-14-2010

Mindee Roth	CNF
Tami Jo Emmett	CNF
Chuck Blair	
JONATHAN RIGG	SWCA
SAEK SHAFIQUAH	CNF
Reta Laford	CNF
WALT KEYES	CNF
DEBBY KRIEGEL	CNF
Kathy Arnold	RCC



Chapter1 draft 082610_tf_GG(1).docx Cooperating Agency Comment Table 082610a_TF(1).xlsx

GG:

In general, the issues and measures seem more than adequate. Make sure that the specialists plan to actually measure all these things. Suggest keeping descriptions and following measures in same order (some are not).

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

AGENCY	COMMENTER	LINE	COMMENT	DISPOSITION
Pima County	C.H. Huckelberry	p. 8 line 225	Add the words "and resources" after "public lands". The Forest Service and other federal agencies have authorities for resources that are not specifically tied to public lands.	Comment incorporated
Pima County	C.H. Huckelberry	p.8 line 229	Add the words "and resources" after "lands".	Comment incorporated
Pima County	C.H. Huckelberry	p.11	Soils: add new factors: Potential for post facto rectification of tailing instability; Area of off-site soil disturbance due to soils importation for reclamation; Qualitative evaluation of alteration of soil biogeochemical processes	Revised to include "Qualitative evaluation of alteration of soil biogeochemical processes". Potential for post facto rectification of tailing instability is not considered to be a measure. Area of off site disturbance is implied in the "Area of disturbance..." , therefore, not incorporated.
Pima County	C.H. Huckelberry	p.12 line 372	strike "given the predicted geochemical...". The potential for revegetation is not limited to geochemical composition. In fact, the land contouring and soils and amendments used in reclamation planning also bear on the outcome.	Comment incorporated
Pima County	C.H. Huckelberry	p. 12	Air: Please report transportation-related (mobile) impacts separately from the other mining-related impacts. Please report both life-of-mine emissions and emissions rates during operations.	Revised to include "transportation -related (mobile)" impacts. Comment "Please report both life-of-mine emissions and emissions rates during operations." is unclear and not Comment incorporated
Pima County	C.H. Huckelberry	p.12 line 386	Add "over a period of time that includes long-term, post-closure impacts."	Comment incorporated
Pima County	C.H. Huckelberry	p.12	Air: Add new factors: "VOC and NOx emissions and emissions rates to air."	Comment incorporated
Pima County	C.H. Huckelberry	p.12	Air: Add "Assessment of monitoring measures' ability to detect air quality impairments".	Monitoring will be covered in Chapter 2.
Pima County	C.H. Huckelberry	p.12	Eastside Water: Add new issue: Relative impairment of mountain-front groundwater recharge function.	Comment incorporated

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

Pima County	C.H. Huckelberry	p.12	Eastside Water, Issue 3A and 3B: Add new factor: "Duration of effects (years)."	Comment incorporated
Pima County	C.H. Huckelberry	p.12	Eastside Water: Add factor similar to Westside: Water needed for operations from the Cienega basin, compared with background (acres-feet).	No water for operations was proposed to be withdrawn from the Cienega basin. Comment not incorporated.
Pima County	C.H. Huckelberry	p. 13 line 407	Westside Water Issue 3B line 407: Measure in acre-feet.	Comment incorporated
Pima County	C.H. Huckelberry	p. 13	Westside Water Issue 3C: Add "Duration of effects (years)"	Comment incorporated
Pima County	C.H. Huckelberry	p. 13	Ground Water Issue 3C: add additional factors: Because groundwater would be accessible to wildlife in the mine pit lake, add "Ability to meet Arizona surface water standards for wildlife at the point groundwater is discharged to the surface". Groundwater Quality, Issue 3C. Add "Effectiveness of monitoring associated with mitigation to detect groundwater impairments."	The Forest Service has given deference to ADEQ on this issue No water standards for wildlife exist. covered in Chapter 2.
Pima County	C.H. Huckelberry	p. 13	Surface Water Availability, Issue 3D: Add factors to address public concerns about alterations to the volume, frequency and magnitude of stormwater runoff in Davidson Canyon, the recharge of the floodplain aquifer by runoff, and changes in the availability of flows from springs to meet surface water uses.	Comment incorporated
Pima County	C.H. Huckelberry	p. 13	Surface Water Quality, Issue 3E: Add "area (acres) and locations that may be affected by surface water quality impacts, and any differences in the duration of those impacts."	Comment incorporated
Pima County	C.H. Huckelberry	p. 13 line 433	Springs, Seeps and Riparian Habitat Issue, line 433: Add "and wetland" after "riparian habitat".	Comment incorporated
Pima County	C.H. Huckelberry	p. 13 line 441	Insert new line: "Acres of floodplain and river miles affected" pursuant to the Executive Order regarding floodplains.	EO 11988, Floodplain Management, deals with does not apply to seeps, springs, and riparian habitats. Acres are included in the current measures. EO 11988 will be considered elsewhere. Comment not incorporated.

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

Pima County	C.H. Huckelberry	P. 14 line 443	Add "and floodplain" after "riparian".	See above response.
Pima County	C.H. Huckelberry	P. 14 line 443	Add new factor: "Relative effectiveness of mitigation measures in avoiding and minimizing impacts to floodplain resources."	See above response.
Pima County	C.H. Huckelberry	p. 14 line 456	Vegetation, line 456: list each distinct vegetation community affected.	Each distinct vegetation community will be addressed in Chapter 3.
Pima County	C.H. Huckelberry	p. 14	Vegetation, new factor: "Area receiving avoidance and minimization measures (acres, configuration, location)."	The IDT considered a variety of configurations to minimize the total acreage of vegetation that was disturbed (e.g., the early Barrel Only Alts).
Pima County	C.H. Huckelberry	p. 14	Add new issue under Impact on Plants and Animals: "Climatic Change. Factors for alternative comparison: <ul style="list-style-type: none"> • Avoidance and minimization of impacts to climatic refugia used by plants and animals. • Qualitative assessment of gross change in climatic conditions caused by the project (will it contribute to local increases in surface and air temperatures?) Relative variation in post-project, micro-site climatic conditions created by different materials, aspect, slope and topographic heterogeneity used in reclamation methods. <ul style="list-style-type: none"> • Qualitative assessment of the resiliency and sustainability of the entire postclosure landscape to climate change."	Climate change was not considered to be an issue for the development of alternatives; however, it will be discussed in Chapter 3. The analysis will be completed per Forest Service Guidance (<i>Climate Change Considerations in Project Level NEPA Analysis</i> , January 13, 2009).
Pima County	C.H. Huckelberry	p.14 line 463	Habitat Loss, line 463: Some habitats are defined by physical features rather than vegetation, e.g. talus deposits and bat roosts. Please list these separately.	Although "habitat" is not defined in this chapter, it includes all biotic and abiotic features required to support plant and animal species. The Coronado will consider defining habitat in the Glossary. Comment not incorporated.
Pima County	C.H. Huckelberry	p.14 line 466	Habitat Loss, line 466: Add "and monitoring" after "mitigation"	Monitoring will be covered in Chapter 2.

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

Pima County	C.H. Huckelberry	p. 14 lines 475 - 476	Non-native Species, lines 475-476: Insert the word "long-term" in front of "effectiveness"	Comment incorporated
Pima County	C.H. Huckelberry	p. 14	This factor should also consider animal species such as the eastern bullfrog, not just plants.	Comment incorporated
Pima County	C.H. Huckelberry	p.14	Non-native Species, add new factor: "Relative effectiveness of measures to detect non-native plants and animals known to pose threats to native species."	Comment incorporated
Pima County	C.H. Huckelberry	p. 15	Wildlife, new issue: "Potential for primary poisoning of wildlife due to mine operations."	Comment lacks specificity. Please clarify the source of "primary poisoning". Comment not incorporated.
Pima County	C.H. Huckelberry	p. 15	Wildlife Movement issue 5D, new factor: "Qualitative assessment of long-term effects to migratory birds."	Measure implied under "[North-south wildlife migration corridors modified and/or lost (acres)". Comment not incorporated.
Pima County	C.H. Huckelberry	p. 15 line 497	Species of Concern, line 497: Add "including lost breeding area," after habitat.	Comment incorporated
Pima County	C.H. Huckelberry	p. 15 line 511	Heritage, line 511 Change to: "The mine footprint will impact historic properties under the proposed action alternatives..."	The word "may" is used in the development of issues because they typically pre-date any analysis and the use of "will" is considered pre-decisional. The convention in NEPA is to use the subjunctive because there is always in the uncertainty in the outcome of the NEPA process. You are correct that the Proposed Action and all Action Alternatives, if selected, would impact historic properties.
Pima County	C.H. Huckelberry	p. 16 line 522	Heritage, line 522: Delete "may". Change to: "...and closure will bury, remove, or damage historic properties	See above response
Pima County	C.H. Huckelberry	p. 16 line 533	Heritage, line 533. Change to: Qualitative assessment of number of sites yet to be discovered (estimated number and types of sites)	Comment incorporated

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Pima County	C.H. Huckelberry	p. 16 line 533	Add new bullet after line 533: <ul style="list-style-type: none"> Qualitative assessment of the types of treatments necessary to mitigate impacts to archaeological sites yet to be discovered 	Comment incorporated
Pima County	C.H. Huckelberry	p. 16 line 540	Add after last sentence in line 540: Arizona State Burial Protections laws (ARS 41-844 and ARS 41-865) protect any human remains on State and private lands.	Comment incorporated
Pima County	C.H. Huckelberry	p. 16 lines 555 & 556	Heritage, lines 555 and 556. Change to: Qualitative assessment of the spiritual, cultural, and emotional impact of desecration of land, springs, a burials, and sacred sites	Comment incorporated
Pima County	C.H. Huckelberry	p. 16 line 556	Add new bullet after Line 556: <ul style="list-style-type: none"> Qualitative assessment of cultural and emotional impacts on the non-American Indian (Euro-american) communities of the region regarding impacts on historic resources, such as historic townsites, cemeteries, mines, ranches, and homesteads". 	Comment incorporated
Pima County	C.H. Huckelberry	p. 17 line 579	Visual Resources, line 579: Strike "percentage" and insert "miles and location of".	Percentage was retained for comparative purposes. However, miles will be included as a metric. Locations will be disclosed in Chapter 3.
Pima County	C.H. Huckelberry	p. 17 line 577	Visual Resources, line 577: Add at end of sentence Including observation points from other Forest Wilderness Areas."	KOPs include Wilderness and non-Wilderness areas. Comment not incorporated.
Pima County	C.H. Huckelberry	p. 18	Dark Skies/new issue and factor: Electromagnetic emissions equipment and impacts upon existing uses in the area.	This issue addresses potential impacts to Dark Skies rather than the generic "existing uses in the area."
Pima County	C.H. Huckelberry	p. 18 line 617	Recreation, line 617: Add "roads and" and "trails/trailheads".	Comment incorporated
Pima County	C.H. Huckelberry	p. 18	Recreation: Insert the words "overall satisfaction of" in front of "outdoor recreation experiences.	Reference not found.
Pima County	C.H. Huckelberry	p. 18	Public Safety, new issue and factor: Impacts of electromagnetic interference with public safety communications including law enforcement, weather detection, military communication devices.	

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Pima County	C.H. Huckelberry	p. 18	Public Safety, new factor: It should be possible to report the estimated cumulative toxic releases over the life of the mine (Right-to-Know law) from each alternative.	Potential releases will be discussed in Chapter 3 under Human Health and Safety.
Pima County	C.H. Huckelberry	p. 18	Public Safety, new issue: Relative effectiveness of mitigation strategies in reducing the concentration and total amount of radioactive substances during copper extraction and beneficiation.	Comment referred to the Geology Specialist
Pima County	C.H. Huckelberry	p. 18	Public Safety, new factor: Qualitative assessment of off-site impacts of Slope stability is discussed in Chapter 3. catastrophic slope failure.	
Pima County	C.H. Huckelberry	p. 19 lines 649 & 650	Socioeconomics, line 649 and 650: Add at end of both bullets "including years after mine closure, for school districts and other affected taxing districts or agencies"	The bounds of analysis for socioeconomics are for the life of the mine, reclamation, and closure (approximately 28 years).
Pima County	C.H. Huckelberry	p. 19	Socioeconomics, new issue: Impacts of transmission alternatives upon electrical grid. New factors: Impacts on TEP ratepayers. Impacts on energy reliability. Impacts on energy congestion. Impacts on green house gas emissions.	The electrical grid and transmission alternatives are outside of the jurisdiction of the Forest Service, therefore not considered to drive alternatives. Impacts on ratepayers and reliability are regulated by the Arizona Corporation Commission and not deemed to drive alternatives. Green house gas emissions will be discussed in Chapter 3.
Pima County	C.H. Huckelberry	p. 19	Socioeconomics, new factor: Likelihood of mine closures due to strikes or low copper prices.	Issues are not developed in response to speculation on economic conditions.
Pima County	C.H. Huckelberry	p. 19	Socioeconomics, new factor: Economic impact of loss of recreational opportunity.	Impacts to recreation are discussed in Chapter 3.

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Pima County C.H. Huckelberry p. 20 New Issue: Geological and Mineral Resources. New factors:
 • Effects to existing cave and karst resources.
 • Effects to existing paleontological resources. • Measures proposed to detect and mitigate impacts to cave, karst, or paleontological resources caused by the project.
 • Effectiveness of producing mineral materials, including limestone and crushed rock products.
 • Slope stability of Santa Rita Mountains resulting from pit configuration.

Geologic and Mineral Resources were not considered to be significant issues as defined by NEPA and evaluated by the IDT. However, the majority of the comments will be addressed in Chapter 3.

AZ Game & Fish John Windes 37, 39, 40 DOCUMENT STRUCTURE
 .and possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.
 (Source: 40 C.F.R. § 1502.16)

ADD: " . . The wording in Chapter 1 are as intended by the Forest Service.

AZ Game & Fish John Windes 119 PURPOSE AND NEED FOR ACTION
 This section needs clarification as it appears to address the purpose and need for the DEIS, not the need for the proposed mine. Line 49 states that Chapter 1 "focuses on the underlying need to which the agency is responding." We understand that the Forest is proposing this project in response to Rosemont Copper's proposal. The Forest must identify the need for the mine, not the need for the document responding to the proposal. Line 132 clearly states that the actions "are for the orderly development of the Rosemont mineral deposit." Therefore the purpose and need must be the purpose and need for "the orderly development of the Rosemont mineral development not the purpose and need for the DEIS. Again, the DEIS must clearly explain what the purpose of the mine is and why there is a need for the mine.

NOTE TO RETA: I agree that it would be good to identify the need for the development of the Rosemont deposit, but this conflicts with the Corps' ideas on P&N.

AZ Game & Fish John Windes 163 "The proposal is consistent with the Coronado's Forest Plan goal to "support environmentally sound energy and minerals development and reclamation." This statement presupposes that the proposal is environmentally sound. The Department recommends striking or revising this text.

Text was revised to remove the presupposition.

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AZ Game & Fish John Windes	171, 183	<p>PROPOSED ACTION IN BRIEF ADD to sentence: "Resource monitoring during construction, operation/reclamation, and closure and post-closure".</p>	<p>Resource monitoring as stated in the comment was not included in the MPO, which fully represents the Proposed Action. The Coronado recognizes the need for resource monitoring during these stages and will include a section on required monitoring in Chapter 2.</p>
AZ Game & Fish John Windes	191, 207, 210	<p>DECISION FRAMEWORK "The Forest Service may reject an unreasonable or illegal Plan of Operations"; and, "The Forest Supervisor will select the Proposed Action or an alternative that allows for orderly development of the mineral resource". The Department recommends replacing "will" with "may" unless the Forest has predetermined that the reasonableness of all alternatives.</p>	<p>Comment incorporated.</p>
AZ Game & Fish John Windes	349	<p>ISSUES This paragraph states that "Issues were separated into two groups: significant issues and non-significant issues" and, "the CEQ regulations specify only significant issues be analyzed. "In line, AMEND to "Significant issues are issues used to formulate alternatives to the proposed action, prescribe mitigation measures or analyze environmental effects." This language appears to define significance based on which issues were chosen; define "significant" and "insignificant" for clarity.</p>	<p>CEQ definition and citation inserted as a footnote.</p>

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AZ Game & Fish	John Windes	391	<p>Issue 3: Impact on Water Resources. Line 392: ADD reference to "wildlife".</p> <p>This paragraph addresses issues relative to water resources and suggests that loss of water availability to "animal habitat" will be addressed in issues 4 and 5. However, nowhere in this section are developed waters or artificial waters discussed in relation to wildlife. Many species of wildlife are dependent on "stock waters" including such special status species such as Chiricahua leopard frogs. Loss of any waters available to wildlife should be considered a significant issue meriting mitigation.</p>	<p>Revised "Issue 5B: Habitat Loss" to include "Loss of aquatic habitats and surface water that supports wildlife such as stock tanks, seeps, and springs."</p>
AZ Game & Fish	John Windes	391	<p>ADD to sentence: "This group of issues relates to the effects of mine construction, operation, and closure and post-closure ..."</p>	<p>Comment incorporated</p>
AZ Game & Fish	John Windes	411	<p>STRIKE: "...may result in a loss of groundwater quality"</p> <p>SUBSTITUTE: "...may result in exceedances of Arizona aquifer water quality standards"</p>	<p>Comment incorporated</p>
AZ Game & Fish	John Windes	412, 413	<p>STRIKE: "the mine pit may fill with water and create a lake that may have an unnatural concentration of chemicals".</p> <p>SUBSTITUTE: "the mine pit is anticipated to create a permanent pit lake that may contain dissolved metals, toxins, and low pH levels".</p>	<p>ADEQ also commented on this topic. Both are included for consideration by the Coronado. AGFD's comment partially incorporated. Suggested language was modified to meet standard NEPA conventions. Now reads: The mine pit may result in the creation of a permanent pit lake that may contain dissolved metals, toxins, and low pH levels.</p>
AZ Game & Fish	John Windes	413	<p>STRIKE: "Construction and operation of the pit, waste rock, and tailings facilities may result in changes in surface water discharge to Davidson Canyon and Cienega Creek".</p> <p>SUBSTITUTE: "Construction and operation of the pit, waste rock, and tailings facilities will likely result in reductions in volume of surface water discharges to Davidson Canyon and Cienega Creek",</p>	<p>Comment not incorporated. Use of the subjunctive "may" is retained per standard NEPA convention.</p>
AZ Game & Fish	John Windes	423	<p>ADD to sentence: "Stock and wildlife watering tanks that will be unavailable"</p>	<p>Comment incorporated</p>
AZ Game & Fish	John Windes	425	<p>ADD a reference to "hazardous substances".</p>	<p>Comment incorporated</p>

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AZ Game & Fish	John Windes	429, 430	AMEND sentence: "Qualitative assessment of the effectiveness of mitigation measures to protect water quality and meet achieve federal CWA Clean Water Act standards"	Section revised per ADEQ's comments
AZ Game & Fish	John Windes	430	<p>ADD new Issue 3E factors:</p> <ul style="list-style-type: none">• Qualitative assessment of the effectiveness of mitigation measures to achieve Arizona surface water quality standards, including the antidegradation standards for Davidson Canyon and Cienega Creek, designated as Arizona Outstanding Waters.• Qualitative assessment of potential for slope failure during major storm events.• Qualitative assessment of potential for surface water and groundwater contamination resulting from acid generating waste rock and tailings material.	Section revised per ADEQ's comments
AZ Game & Fish	John Windes	432	<p>Issue 4: Impact on Springs, Seeps, and Riparian Habitats</p> <p>The Department recommends creating two sub-issues under this topic. The first sub-issue addresses the effects on riparian habitat from surface water discharges from mine operations. The second sub-issue is focused on the direct and indirect effects of the pit lake on the regional groundwater table and surface discharge. This section or the following should also address the effects of depth to groundwater on riparian habitat likely to be affected by the drawdown of the aquifer and the hydraulic sink created by the pit.</p> <p>STRIKE: Issue 4.</p> <p>SUBSTITUTE: Issue 4A. This issue relates to the potential impacts on riparian habitat from the alteration of surface hydrology from mine operations. Potential impacts may include the reduction of surface water runoff into receiving drainages and canyons. Issue 4A Factors for alternative comparison [no change from original]</p>	Section revised per ADEQ's comments
AZ Game & Fish	John Windes	436		

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AZ Game & Fish	John Windes	442	ADD a new Issue 4B: This issue relates to the potential impacts on streams, springs, seeps, riparian habitats and wildlife from the peunant drawdown of the regional groundwater table resulting from the formation of a pit lake in the mine pit following mine closure. [new] Issue 4B: Groundwater Availability. The pit lake that will form following mine closure will become a permanent hydraulic sink that will lower the regional groundwater table in perpetuity. The lowering of the water table will impact seeps and springs fed by groundwater sources, as well as intermittent or perennial streams within Davidson Canyon where groundwater serves as a source of recharge to such stream reaches. Cienega Creek water levels may also be affected as a receiving water from Davidson. Canyon. [New] Issue 4B Factors for alternative comparison	Section revised per ADEQ's comments
			<ul style="list-style-type: none">* Seeps and springs degraded or lost• Intermittent or perennial stream surface water losses in Davidson Canyon/Cienega Creek as a result of pit lake groundwater level drawdown.• Loss or dispersal of biotic communities dependent on seeps, springs and stream reaches.• Loss of riparian habitat and obligate species	
AZ Game & Fish	John Windes	444, 446	Impact on Plants and Animals. This section focuses on the "viability of populations of species of conservation concern". All wildlife are held in trust for the public by the State of Arizona under the statutory authority of the Arizona Game and Fish Department (ARS § 17-102). The Forest must consider all wildlife species, not just "species of conservation concern". The public's loss of wildlife resources cannot be predetermined to be "insignificant" especially given that some unlisted species, such as the Rosemont tallus snail, are endemic to the area.	
			AMEND line 445 to "This group of issues focuses on the effects on wildlife and plants."	
AZ Game & Fish	John Windes	447	ADD reference to Arizona-listed species of concern and Arizona-listed species of recreational and economic importance.	Economic impacts to recreation are covered in Chapter 3.

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AZ Game & Fish John Windes

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Species of conservation concern. This term, and "species of concern" appear several times with different parenthetical definitions. The Department requests that the Forest use the Arizona Game and Fish Department's "Species of Greatest Conservation Need" (SCGN) when referring to state-listed "species of concern." This list is found in our State Wildlife Action Plan.

Comment deferred to Wildlife Specialist.

AZ Game & Fish John Windes

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Habitat Loss: This section appears to either be addressing only botanical species or (by inference only) both wildlife habitat loss and populations of plants. This conflation obscures the meaning of the issues. The Department suggests splitting 5B into separate animal and plant sections to avoid confusion. Habitat types other than vegetation (e.g. talus slopes, bat roosts, stock tanks, etc.) should be listed and discrete populations and metapopulations or potential metapopulations (e.g. leopard frogs) should be examined. Loss of wildlife habitat should be examined closely. Wildlife habitat loss evaluation should examine effects on individuals, populations, and species. Discrete populations (such as Rosemont talus snail in talus slopes or Chiricahua leopard frog metapopulations in stock tank complexes) are tied to those discrete habitats and habitat complexes. Modification may result in entire population or metapopulation losses, whereas other habitat disturbance is merely additive or cumulative loss to larger habitats. ADD new Issue: Habitat Degredation and Modification. This may be inferred in "loss" but loss may also imply only

Comment incorporated by response to Pima County's comment.

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that habitat which has been replaced by the mine footprint. Habitat degradation may include disturbance to migration routes for migrating birds and bats due to effects of light pollution, new water sources, loss of water sources, unanticipated ecological changes such as modified insect or plant populations, introductions of non-native species, invasive plants, etc. Degradation might also include the effects of the mine far from the mine site including light, fugitive dust, and noise pollution, water pollution, effects on springs, seeps, Cienega Creek and Davidson Canyon, fragmentation/degradation of home range for wide ranging species, loss of travel routes, and edge effects. In effect the mine site will impact the ecology of a much wider area than the footprint of the mine, potentially causing habitat degradation or ecological effects far offsite.

AZ Game & Fish	John Windes	466	ADD "and monitoring" after "mitigation"	Monitoring will be covered in Chapter 2.
AZ Game & Fish	John Windes	470	Non-Native Species, This section appears to address only non-native plants. The Department suggests that exotic wildlife such as bullfrogs and non-native fish may be significant issues worthy of consideration. Non-native plants and animals should be addressed separately	Comment incorporated by response to Pima County's comment.
AZ Game & Fish	John Windes	477	Wildlife Movement. This section addresses "the north south wildlife migration corridor" This is a general description with no definition. Is this a reference to migratory bird use? There are many ways wildlife movement can be affected, from fragmentation of terrestrial habitat connections to the attraction of the pit lake on migrating waterfowl. Again, all wildlife should be considered.	Comment incorporated by response to Pima County's comment.

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AZ Game & Fish John Windes 485 Species of concern. The Department does not dispute the need to address "species of concern" however all wildlife must be addressed somewhere in this section. All wildlife are public trust resources whose loss must be mitigated. Again, the Department requests using our Species of Greatest Conservation Need (SGCN) list when referring to "species of concern" to the State of Arizona. The Department also suggests that our Species of Recreational and Economic Importance (SERI) should be addressed, perhaps in the economic or recreational sections as well as this section.

Comment referred to the Wildlife Specialist

AZ Game & Fish John Windes 494 ADD new Issue 5E Factors for alternative comparison:
 • Loss of migratory birds, bats, and other wildlife attracted to open process ponds during operational phase of oxide ore production
 • Potential injury to or loss of migratory birds, bats, and other wildlife due to exposure of metals and/or low pH levels in pit lake

Current Issue statement is inclusive of the pit lake and heap leach by using the general term "mine operations".

AZ Game & Fish John Windes 602 Impact on Recreation. This section attempts to address the recreational importance of wildlife in terms of hunting permits, which we applaud. However, all wildlife species need consideration when considering impacts on recreation. Wildlife viewing has been documented as a major economic engine in southeast Arizona, with a \$326 million dollar impact to the economy of Pima County in a 2003 study (available on our website). The Santa Rita Mountains are a major destination for wildlife enthusiasts due to the biodiversity found here, which few other areas can rival in the continental U.S.

Impacts to recreation and socioeconomics are discussed in Chapter 3.

AZ Game & Fish John Windes 636 Socioeconomic Impacts. Again, this section should address the adverse impacts on the local economy due to loss of wildlife-related recreational opportunities.

Impacts to recreation and socioeconomics are discussed in Chapter 3.

Army Corp of Engineers Marjorie Blaine 28 We recommend you revise this statement to make it consistent with NEPA by stating "...involves significant beneficial and adverse impacts on the human environment".

comment incorporated

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Army Corp of Engineers Marjorie Blaine 30 Although we did not comment on it in the previous rendition of the draft for Chapter 1, we do not typically use "USAGE" in our documents but prefer to use "Corps". We recommend revising the reference to the Corps as "U.S. Army Corps of Engineers (Corps)"; this will require that you change all subsequent references to "USAGE" to "Corps". Our apologies and we do appreciate your efforts. Comment incorporated

Army Corp of Engineers Marjorie Blaine 120 - 138 We believe the Purpose and Need for the project are not defined. Please reference the EIS completed by the Bureau of Land Management for the Phelps Dodge (now Freeport,McMoran) Dos Pobres/San Juan Project. It clearly states that the "...purpose of the Proposed Action (the Dos Pobres/San Juan Project) is to enable PD to develop its mining claims and the mineral resources associated with the Dos Pobres and San Juan leachable copper ore deposits as an integrated project". We strongly urge the Forest Service to review this document as the purpose/need statements are well written and do not put the emphasis on the Federal lead agency as having the purpose and need. For the Forest Service and the action being considered under NEPA, the purpose of the proposed action is simple: "to enable Rosemont Copper to develop its mining claims and the mineral resources associated with the Rosemont ore body". The need for the project is for Rosemont Copper "to conduct operations that are reasonably incidental to exploration and development of mineral deposits on its mining claims". The purpose and need statements should be clearly and concisely stated. We highly recommend that you delete lines 139-162. They may be more applicable to the section under "Decision Framework".

Army Corp of Engineers Marjorie Blaine 136 Please change "Waters of the United States" to WUS as you have already indicated the acronym in line 116. Comment incorporated

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Army Corp of Engineers	Marjorie Blaine	272	Please revise the statement so it reads " ..the discharge of dredged and/or fill material into WUS..." Please note you have already defined the acronym for WUS in line 116.	Comment incorporated
Army Corp of Engineers	Marjorie Blaine	277	Please change "USACE" to "Corps and insert "the" before "Corps" towards the end of the sentence.	Comment incorporated
Army Corp of Engineers	Marjorie Blaine	280 - 283	The correct revisions were not previously made regarding our basic and overall project purposes. We would appreciate revision of this paragraph to read: "For purposes of the Section 404(b)(1) alternatives analysis, the basic project purpose is to mine copper which is a non-water dependent activity. The overall project purpose is to mine copper using conventional open pit mining and sulfide (mill and concentrate) and oxide (leach and SX/EW) ore processing for the purpose of producing copper and/or copper precursors, silver, and molybdenum in the State of Arizona" After further in-house conversations and consideration, we have decided to somewhat limit the area for consideration of offsite alternatives. Therefore, we respectfully request that our overall project purpose as stated within lines 280-283 in the draft of Chp 1 read: "The overall project purpose is to mine copper using conventional open pit mining and sulfide (mill and concentrate) and oxide (leach and SX/EW) ore processing for the purpose of producing copper and/or copper precursors, silver, and molybdenum within the mining district of southeastern Arizona (Pinal, Gila, Greenlee, Graham, Cochise, Santa Cruz, and Pinal Counties) " .	Comment incorporated
Army Corp of Engineers	Marjorie Blaine	289	We would appreciate it if you would substitute the above overall This sentence should read "Whether to issue Rosemont Copper an Individual CWA Section 404 permit...". Please omit "(b)(1)" as that is a reference to the guidelines for our alternatives analysis and not a reference to the type of permit we issue.	Comment rendered moot by following comment

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Army Corp of Engineers	Marjorie Blaine	287 - 296	After additional thought, we believe this section needs to be simplified. The revised sentences should read "Based on the analysis in the FEIS and supporting documentation; the Corps' public interest review; and the determination of the least environmentally damaging, practicable alternative in the Section 404(b)(1) alternatives analysis, the Los Angeles District Commander will determine whether to (1) issue Rosemont Copper an Individual CWA Section 404 permit for the discharge of dredged and/or fill material into WUS for the PPO or (2) issue Rosemont Copper an Individual CWA permit with modifications or special conditions, or (3) deny the Section 404 permit."	Comment incorporated
Army Corp of Engineers	Marjorie Blaine	297 - 301	Please delete the first sentence. The second sentence should be revised to state "The Corps will issue a public notice during the DEIS comment period and will consider all comments received in response to the public notice, the DEIS, and public hearings (if applicable) as part of the public interest review. Following the issuance of the FEIS, the Corps will prepare a Record of Decision regarding the Section 404 permit. The Corps' administrative appeal process allows the applicant to appeal a proffered permit which the applicant has declined or a denied permit.	Comment incorporated
Arizona Department of Water Resources	Laura Grignano	NA	At this time the Department has no changes to the draft language of Chapter 1 for the <i>Rosemont Copper Project Draft Environmental Impact Statement</i> .	Thank you for your response.
Arizona State Land Department	David F. Jacobs	NA	Arizona State Land Department requests no changes and has no comments on the draft Chapter 1 circulated on July 15, 2010.	Thank you for your response.
Town of Sahuarita	Joseph Marques	page 2	The map in the upper right hand corner has a white block over the Town of Sahuarita boundaries. Please remove the block to show the actual Town of Sahuarita town limits. (Comment from TOS Planning and Zoning Department)	Comment incorporated (this was a printing error)

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Town of Sahuarita	Joseph Marques	204 - 208	This paragraph is obviously alluding to the "No Action" alternative, so Although the Forest Service Office of provide readers a detailed explanation of the No Action alternative as General Counsel currently advises that part of the paragraph. (Comment from TOS Planning and Zoning Department)	choosing the No Action may not be legal, this portion of the document is intended to inform the public that any illegal or unreasonable Plan of Operations for mining may be rejected. No changes made.
Town of Sahuarita	Joseph Marques	335	Indicate the location of the detailed records. Provide either the website or physical address. (Comment from TOS Planning and Zoning Department)	Comment incorporated.
Town of Sahuarita	Joseph Marques	395 -396	Issue 3A Easidside Groundwater Availability, notes the "Household water availability may be reduced." However, Issue 3A only identifies changes in water table level and the geographic extent of where water analysis is contained in Chapter 3. resources may be impacted. The EIS should include an assessment of the effectiveness of proposed mitigation to offset groundwater subsidence and declining water tables through replenishment of water supplies, direct use of alternative water supplies, etc. (Comment from TOS Public Works)	Mitigation measures are described in Chapter 2 and assessments and Chapter 3.
Town of Sahuarita	Joseph Marques	401, 403	Issue 3B Westside Groundwater Availability, notes the "Water needed See above response. to run the mine facility might reduce groundwater availability to private and public wells in the Santa Cruz Valley." Furthermore, Line 403 notes "Household water availability may be reduced." Issue 3B only proposes to evaluate the water use, changes in water table level and the geographic extent of where water resources may be impacted. The EIS should include an assessment of the effectiveness of proposed mitigation to offset groundwater subsidence and impacts to private and public wells through replenishment of water supplies, direct use of alternative water supplies, etc. (Comment from TOS Public Works)	

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Town of Sahuarita	Joseph Marques	402	<p>This sentence calls for more specificity. It should end: " Santa Cruz Valley, specifically the communities of Sahuarita, Arizona, and Green Valley, Arizona." To the uninitiated — and this document will be read by interested parties across the country — the reference to the "Santa Cruz Valley" without qualifications may suggest some lonely strip of desert, rather than a valley that is home to 45,000 people and 5,000 acres of agriculture. (Comment from TOS Town Manager's Department)</p>	Comment incorporated.
Town of Sahuarita	Joseph Marques	476 - 478	<p>Issue 5D Wildlife Movement, notes "The mine operations may modify and/or fragment the north-south wildlife migration corridor and/or connectivity between habitats." Further, Issue 5D notes "The transportation system and increased traffic could result in more wildlife road kills." Issue 5D factors for alternative comparison only includes an assessment of the potential damage. Issue 5D should also include a qualitative assessment of the effectiveness of mitigation alternatives. (Comment from TOS Public Works)</p>	Mitigation measures are described in Chapter 2 and the effectiveness will be analyzed in Chapter 3. Note that the development of mitigation has not been completed and not all issues identified in Chapter 1 will be mitigated.
Town of Sahuarita	Joseph Marques	510	<p>Change the word "may" to "will" in the sentence; "The mine footprint 'may' impact historic properties" because the all the alternatives provided appear to impact historic properties, with the exception of the No Action alternative. (Comment from TOS Planning and Zoning Department)</p>	The word "may" is used in the development of issues because they typically pre-date any analysis and the use of "will" is considered pre-decisional. The convention in NEPA is to use the subjunctive because there is always in the uncertainty in the outcome of the NEPA process. You are correct that the Proposed Action and all Action Alternatives, if selected, would impact historic properties.
Town of Sahuarita	Joseph Marques	525 - 527	<p>Issue 6A, Historic Properties, notes impacts to historic properties and "the permanent alteration of cultural landscapes important to the ongoing cultural practices of Native American tribes and historic communities." Issues 6A factors for alternative comparison only proposes to evaluate the damage, but does not provide an assessment of any proposed mitigation. Issue 6A should also include a qualitative assessment of the effectiveness of mitigation alternatives. (Comment from TOS Public Works)</p>	See above response regarding mitigation.

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Town of Sahuarita	Joseph Marques	550	Use "will" instead of "may" in the sentence; "Mine construction, operation with concurrent reclamation, and closure 'may' preclude access to or destroy or degrade these types of resources." (Comment from TOS Planning and Zoning Department)	See above response regarding the use of the subjunctive.
Town of Sahuarita	Joseph Marques	570, 573	The visual impacts are unavoidable with this project; as a result, replace "may" with "will." (Comment from TOS Planning and Zoning Department)	See above response regarding the use of the subjunctive.
Town of Sahuarita	Joseph Marques	572 - 573	Issue 7, Impact on Visual Resources, notes "Regardless of mitigation measures or reclamation required, the scenic quality of the landscape may be permanently degraded." Issue 7 should include an assessment of the effectiveness mitigation measures and reclamation required. (Comment from TOS Public Works)	See above response regarding mitigation.
Town of Sahuarita	Joseph Marques	620	Issue 10, Impact on Public Safety, notes risks to the public from increased traffic, oversized vehicles, hazardous materials, mining operations and air quality. Issue 10 factors for alternative comparison only includes an assessment of risks and conflicts, but does not include an assessment of proposed mitigation. Issue 10 should include an assessment of the effectiveness of mitigation measures to reduce impacts to public safety. (Comment from TOS Public Works)	See above response regarding mitigation.
ADEQ	Dennis L. Turner	411 - 414	Construction and operation of the mine pit, along with tailings, waste rock and leach facilities may result in the loss of degrade groundwater quality through the discharge of pollutants to the aquifer. The mine pit may fill with water and create a lake that may have an unnatural concentration of chemicals concentrate pollutants that have the potential to discharge to groundwater. Likewise, disposal of waste material to surface facilities, such as tailings, waste rock and leaching operations may contribute to degradation of the aquifer.	Comment incorporated
ADEQ	Dennis L. Turner	419 - 421	Construction and operation of the mine pit, tailings, waste rock and leach facilities may result in changes in surface water discharges to Davidson Canyon and Cienega Creek. Beginning approximately 11 miles downstream, Davidson Canyon has been designated as an outstanding Arizona water (OAW) by the Arizona Department of Environmental Quality (AQDEQ). Approximately eight miles to the east lies the designated OAW segment for Cienega Creek (A.A.C. R18-11-112(8) and (21)). The availability of water for stock water tanks may be reduced.	Comment incorporated

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

ADEQ	Dennis L. Turner	422	<p>Issue 3D, Factor Factors for alternative comparison, line 422: [Add additional bullets (factors) for alternatives:] -- <i>Determination/estimation of number of stream miles changed from intermittent flow status to ephemeral flow status as a result of the project --Potential lowering of the water table/reduced groundwater flow to Davidson Canyon and Cienega Creek that result in permanent changes in flow patterns may affect their designations as OAWs and current designated uses.</i></p>	Comment incorporated
ADEQ	Dennis L. Turner	425 - 428	<p>Issue 3E, Surface Water Quality, lines 425 — 428: [Existing language is fine, please add the following:] <i>Downstream segments of Davidson Canyon and Cienega Creek have been designated as Outstanding Arizona Waters (OAW) by ADEQ (A.A.C. R18-11-112 (8) and (21). OAWs are Tier 3 waters for antidegradation purposes and are given the highest level of antidegradation protection. As outstanding resource waters, Tier 3 waters must be maintained and protected, with no degradation in water quality allowed (A.A.C. R18-11-107(D)).</i></p>	Comment incorporated
ADEQ	Dennis L. Turner	429 - 431	<p>Issue 3E, Factor Factors for alternative comparison, lines 429 — 431: [As the first bullet, please add:]-- <i>Ability to meet State of Arizona surface water quality standards (line 430) --Qualitative assessment of the effectiveness of mitigation measures to protect water quality and meet GWA State of Arizona surface water quality standards. (lines 431 — 432)</i></p>	Comment incorporated
ADEQ	Dennis L. Turner	437 - 443	<p>Issue 4, Factors for alternative comparison, line 437-443: <i>"Wildlife corridors disturbed"</i> should be a separate action item (an additional bullet) for the alternatives development. The location of springs, seeps and intermittent stream reaches are key components of wildlife corridors. Loss of these habitats will result in rerouting or loss of a variety of species. This should be addressed separately from the acres of riparian habitat disturbed.</p>	The Forest Service has given deference to ADEQ on issues with respect to wildlife.
ADEQ	Dennis L. Turner	494	<p>Issue 5E, Factors for alternative comparison, lines 494: [Add additional bullet (factor) for alternatives] -- <i>Loss of aquatic life, especially macroinvertebrates and fish, as a result of losses in springs, seeps and stream flows</i></p>	Comment incorporated

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

ADEQ	Dennis L. Turner	496	<p>Issue 5E, Species of Concern, line 496: To provide proper context, it may be useful to understand the percent of habitat lost per species given within the Santa Cruz River basin, or within the Cienega Creek watershed instead of a percentage of the whole range for that taxon.</p>	<p>The Bounds of analysis for biological resources is based on the combination of the Action Area for all alternatives, including areas indirectly affected (i.e. possibly Davidson Canyon, lower Cienega Creek, and Pantano Wash.</p>
AZ Dept of Mines & Mineral Resources	Madan M. Singh, Ph.D., P.E.	189	<p>there is a reference to a "Class I airsheds." Does the Santa Ritas area qualify as a Class I airshed? My understanding is that a Class I area as defined in the Clean Air Act is "the following areas that were in existence as of August 7, 1977: national parks over 6,000 acres, national wilderness areas and national memorial parks over 5,000 acres, and international parks." My perception may be wrong.</p>	<p>There is no Class I airshed in the Santa Ritas. However, Saguaro National Park is a Class I airshed.</p>
AZ State Mine Inspector	Garrett Fleming		<p>It appears to ASMI that the impact on land stability and soil productivity can occur safely at the Rosemont Copper project under any of the alternatives as well as the original submitted plan. It appears also that the original plan has less impact as a substantial footprint with the best land stability, and least likely losses of sediment, and can easily be engineering controlled for longterm stability of tailings and waste piles, and/or revegetation efforts. This does not take into account all other issues regarding air quality; groundwater & surface water; habitat; plants protection; historic or heritage resources; and visual, social and/or recreation impacts. It would appear that the smallest footprint to the National Forest is of the best interest. The original reclamation plan in the Proposed Plan of Operations (PPO) therefore appears to have been planned in a manner to attain an adequate impact to land stability and soil productivity results for a revegetated landscape, while providing the least impact to this issue 1, while mining for these limited natural resources.</p>	<p>Thank you for your response.</p>
AZ State Parks	Dr. Robert R. Casavant	134	<p>Add the words "or eliminates" after "reduces"</p>	<p>The Purpose and Need has been reviewed and deemed appropriate.</p>
AZ State Parks	Dr. Robert R. Casavant	134	<p>Add the words "resources and the functionality of" after "impact</p>	<p>The Purpose and Need has been reviewed and deemed appropriate.</p>
AZ State Parks	Dr. Robert R. Casavant	135	<p>Add the words "and environmentally linked public and private lands" after "administrated lands"</p>	<p>Upon review of the existing wording is retained.</p>

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

AZ State Parks	Dr. Robert R. Casavant	225	Add the words "inventory and" after "What" and before "monitoring" Monitoring will be covered in Chapter 2.	The Forest Service will clarify review and clarify the section as appropriate.
AZ State Parks	Dr. Robert R. Casavant	225	Add the words "related surface and subsurface resources" after "lands"	
AZ State Parks	Dr. Robert R. Casavant	361	Omit the word "may" after "soils".	The word "may" is used in the development of issues because they typically pre-date any analysis and the use of "will" is considered pre-decisional. The convention in NEPA is to use the subjunctive because there is always in the uncertainty in the outcome of the NEPA process.
AZ State Parks	Dr. Robert R. Casavant	362	Change "accelerate" to "accelerates". Change "reduce" to "reduces". Add "The clearing vegetation, stripping and stockpiling of soils results in accelerated erosion and reduced soil productivity in the affected sites due to the disturbance and disruption of integrated soil structural and geo- and biochemical (bacterial, fungi) matrices and processes." (This issue continues to remain under-characterized in PPO and FEIS documentation and post-mining reclamation assessments.) Omit the word "may" after "soil resource"; change "result" to "results"	This will be discussed in greater detail in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	365	Omit the word "may" after "soil resource"; change "result" to "results"	See above response regarding the use of the subjunctive.
AZ State Parks	Dr. Robert R. Casavant	366	After "soil", add the words "productivity, physical structure and ecological function across the proposed mine site, and across down gradient lands, if the mining area acts as a barrier to sourcing and supporting natural down slope transportation of geologic material, water, and nutrients through alluvial, eolian, and fluvial processes."	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	370	After "area", add the words " and quantitative level"	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	371	Omit "predictive geochemical". This implies some certainty, which case studies confirm is changes over time. The state of modeling, knowledge and confirmed research do not support the certainty with time. In addition, re-contouring and various in-situ drainage alternatives in the MOP could negatively influence the success of re-vegetation. Omit "predictive geochemical". This implies some certainty, which	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	372	Omit "predictive geochemical". This implies some certainty, which	Comment incorporated

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

AZ State Parks	Dr. Robert R. Casavant	372	After “composition” add the words “and architecture”	Comment conflicts with Pima County’s suggested change
AZ State Parks	Dr. Robert R. Casavant	p. 12	Make mention of monitoring the off-site degradation of air quality and transport of particulates and aerosol from increased off-site traffic and transportation related to the mining operation.	The monitoring will be discussed in Chapter 2 and is tied to a Pima County permit. Comment not incorporated.
AZ State Parks	Dr. Robert R. Casavant	p. 12	Add a comment regarding the monitoring of on- and off-site volatiles and their transport related to hydrocarbon spills, petroleum-based lubricants, fuels, tire wear, emissions, etc.	See above comment
AZ State Parks	Dr. Robert R. Casavant	390	line 390—Add “Long-term, post-closure” before “Quantitative”. This is an on-going negative impact for the industry and effected communities decades after mine closures occur. Add the word “directions” after “Degree”	See above comment
AZ State Parks	Dr. Robert R. Casavant	399	Add the words “and rate” after “range”	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	399	Add the words “and rate” after “range”	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	400	The so-called water table “background” as currently understood by the IDT and mapped by Rosemont contractor, Montgomery & Assoc. appears to be under characterized relative to mapping completed by ASP-Pima CO using the same publicly available data	Comment noted. This will be further analyzed in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	407	Add the words “(acre/feet)” after “Water”	Similar comment from Pima County is incorporated
AZ State Parks	Dr. Robert R. Casavant	p. 12	Add issue: Disturbance to complex mountain-front recharge functionality and capacity.	See above comment
AZ State Parks	Dr. Robert R. Casavant	p.12	New issue: Relative quantitative impairment to the output and seasonality of natural spring flows and associated soil moisture content.	Comment incorporated
AZ State Parks	Dr. Robert R. Casavant	p. 13	Integrate and adapt into this section similar comments provided in the previous Eastside water (Issue 3a).	Deference has been given to ADEQ on this issue.
AZ State Parks	Dr. Robert R. Casavant	p. 13	Add “Ability to demonstrate effectiveness of groundwater monitoring technology and quantitative assessment”	Monitoring will be covered in Chapter 2.
AZ State Parks	Dr. Robert R. Casavant	p. 13	Add issue statement addressing changes in the amount, geochemistry, and quality of surface flow contributions from natural springs related to human, flora and fauna use.	Deference has been given to ADEQ on this issue.
AZ State Parks	Dr. Robert R. Casavant	p. 13	Add issue: Increased and variable downstream flows resulting from storm water runoff associate with the mine operations, and diversion of site runoff; loss of infiltration and retention from soil may increase the volumes and frequency of runoff	Deference has been given to ADEQ on this issue.

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

AZ State Parks	Dr. Robert R. Casavant	p. 13	Quantification assessment to include the mapping locations of change in water quality and rate of change in those locations	This will be discussed in greater detail in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	p. 14	Add: Inventory (quantitative assessment) of floodplain, river terrace and riparian areas and environs and associated monitoring of these elements	EO 11988, Floodplain Management, deals with does not apply to seeps, springs, and riparian habitats. Acres are included in the current measures. EO 11988 will be considered elsewhere. Comment not incorporated. See comment above.
AZ State Parks	Dr. Robert R. Casavant	443	After the word "riparian", add the words "and floodplain	
AZ State Parks	Dr. Robert R. Casavant	454	New issue-- Mine-related impacts may be exasperated by climate change models that are playing out to be predictive for the region. Stresses predicted from regional climate models, localized alteration (e.g. changes in slope-sun aspect, slope angles, reductions in soil retention and infiltration capacity from soil removal or compression, warmer surface temperatures, etc.), and the loss of surface vegetation may negatively impact flora off-site in a singularly or collective manner as functional thresholds are exceeded. Model inputs, outcomes and predicted climate scenarios for the region should be integrate into designing a range of reclamation strategies for vegetation. The restoration to natural floral conditions may not be as successful if warmer temperatures and increasing arid conditions lower functional thresholds below known tolerances. Climate change in concert with historical mining restoration programs may permanently keep flora communities from restoring to natural conditions."	Climate change was not considered to be an issue for the development of alternatives; however, it will be discussed in Chapter 3. The analysis will be completed per Forest Service Guidance (Climate Change Considerations in Project Level NEPA Analysis, January 13, 2009).
AZ State Parks	Dr. Robert R. Casavant	456	After "(acres)" add the words "to be monitored and analyzed across the mine site and related watershed(s). Baseline qualitative and quantitative monitoring data can be compared against syn-mine and post-mine data. Add the words "and continued monitoring" after "assessment"	"Acres" is incorporated. Monitoring will be covered in Chapter 2.
AZ State Parks	Dr. Robert R. Casavant	475	Add the words "and continued monitoring" after "assessment"	Monitoring will be covered in Chapter 2.
AZ State Parks	Dr. Robert R. Casavant	497	Add the words "and continued monitoring" after "assessment".	Monitoring will be covered in Chapter 2.

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

AZ State Parks	Dr. Robert R. Casavant	Issue 5e and 5f: Behavior: Address specifics on endangered bat populations, located in the area. (Numerous caves and karst features exist 6-7 miles south of the mine area). Populations could be adversely affected by lights, solids and metal-contaminated waters in the pit and artificial ponding that is designed or natural occurs on the property during operations and form long after mine closure occurs on many mine properties.	This will be discussed in greater detail in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	Omit the word "potential"	The word "potential" is retained until the impact is analyzed in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	Negative visual and audio impact of mining operations and visual impact of postmining pit and tailings will negatively impact to adjacent recreation in regard to solitude and use of adjacent backcountry areas. This issue also links to Issue 7, p. 17, line 576.	This will be discussed in greater detail in Chapter 3.
AZ State Parks	Dr. Robert R. Casavant	617	
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocius	Page 4, Line 86	After the words "Length and number of" add the words "forest service roads and trails/trailheads" "The analyses conducted for this project reflect the best available science." How is that determination made? It is certainly the right target. Is there some assessment process similar to referee or peer review as for scientific journals?
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocius	Page 12, Lines 85-90	Do these standards include assessments of airborne sulfur or sulfur compounds? Atmospheric sulfur is by far the most powerful agent in attacking the aluminum coatings on telescope optics.
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocius		Comment deferred to the Air Quality Specialist.
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocius		The conventionally accepted sources for scientific information are the peer-reviewed literature, the gray literature, expert opinion, and anecdotal experience. These sources are commonly viewed as reflecting different levels of innovation, quality, respectability, and accessibility depending on the source and the uses to which they have been put. However, it may not be possible to conclude that a single source of information-conventional or new-is the best under all circumstances.

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 17, Lines 582-3	"Increased light, air particulates and gases..." Increased light overwhelms the faint light of the stars. Air particulates absorb and scatter incoming starlight, making it fainter and fuzzier. Gases do not affect the starlight directly, but sulfur gases do attack the aluminum coatings on telescope optics. Therefore the gases component might be better placed under Air Quality.	Comment incorporated
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 17, Lines 583-4	"The increased sky glow ... objects." This would be better stated, "The increased sky glow would reduce the visibility of all celestial objects, particularly the faint ones that are often the subject of scientific study."	The Comment incorporated
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 17, Lines 586-7	The Observatory name is the Smithsonian Institution's Fred Lawrence Whipple Observatory.	Comment incorporated
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious		The lighting code is known as the Pima County Outdoor Lighting Code.	Comment incorporated
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 17, Line 590-92	"The PPO is exempt from ... may not be able to conform to the Code (because of worker safety concerns)." How has this determination been made?	Arizona law exempts mining operations from local zoning codes. Although the PPO is exempt, mitigation may be developed that addresses potential impacts while maintaining safety standards. Measure has been deleted.
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 18, Line 96	The alternative comparison of "Area that would not meet Pima County [Outdoor] Lighting Code (acres)" is unclear to us. A comparison of non-compliant acres is not as useful as quantifying the overall quantity, color and direction of light emitted by the mining operation under various alternatives.	Comment incorporated
Smithsonian Institution's Fred Lawrence Whipple Observatory	Emilio Falco, Dan Brocious	Page 18, Lines 97-8	"Qualitative assessment of effectiveness of mitigation measures to reduce dust and impact night sky visibility." This would be better stated, "Quantitative assessment of effectiveness of mitigation measures to reduce dust and thereby reduce dust's impact on night sky visibility." (Quantitative measurements will tell us what we need to know.)	Comment incorporated

Cooperating Agency Comments On Chapter 1 of the Preliminary Rosemont Copper Draft EIS

Smithsonian Institution's Fred Lawrence Whipple Observatory ADOT	Emilio Falco, Dan Brocious	Page 19, Line 00-01	Here again, "quantitative" should replace "qualitative" because the impact is how much dust settles on telescope optics in one alternative versus another.	Comment incorporated
Charles Beck	NA	ADOT has reviewed Chapter 1 of the Rosemont Copper Project Draft Environmental Impact Statement, and has no comments on the chapter draft."	Thank you for your comment.	Comment incorporated
Daniel Moore	Line 44-45	The complete citation for the Phoenix Resource Management Plan is Phoenix Resource Management Plan and Final Environmental Impact Statement, September 1989, U.S. Department of the Interior, Bureau of Land Management, Phoenix District, Arizona.	Comment incorporated	Comment incorporated
Daniel Moore	Line 124	Insert: "Under 43 CFR 3809, the Bureau of Land Management must determine whether to approve the PPO submitted by Rosemont Copper, approve the PPO subject to changes or conditions that are necessary to meet the performance standards of 43 CFR 3809.420 and to prevent unnecessary or undue degradation, or to disapprove or withhold approval of the PPO for reasons specified in 43 CFR 3809.411(d)(3). In addition, the Bureau of Land Management must determine if any occupancy of BLM administered lands proposed in the PPO is in conformance with the regulations of 43 CFR 3715."	Comment incorporated	Comment incorporated
Daniel Moore	Line 127	Insert: "Under regulations of the Secretary of the Interior, Rosemont Copper must conduct mining operations in accordance with the regulations of 43 CFR 3809 and 43 CFR 3715 under a Bureau of Land Management approved Plan of Operation."	Comment incorporated	Comment incorporated
Daniel Moore	Line 169	Insert: "Phoenix Resource Management Plan, 1989, p. 14"	Comment incorporated	Comment incorporated
Daniel Moore	Line 252	Change "District Manager" to "Field Manager".	Comment incorporated	Comment incorporated
Daniel Moore	Line 257-259	Remove reference to amending the BLM Resource Management Plan. No activities identified in the MPO or possible alternative discussed to date are in conflict with the existing MPO.	Comment incorporated	Comment incorporated



"Blaine, Marjorie E SPL"
<Marjorie.E.Blaine@usace.army.mil>

07/21/2010 12:08 PM

To "Reta Lafort" <rlafort@fs.fed.us>

cc "Melinda D Roth" <mroth@fs.fed.us>, "Tom Furgason"
<tfurgason@swca.com>, "Brian Lindenlaub"
<blindenlaub@westlandresources.com>

bcc

Subject RE: Rosemont

Reta

No...I won't be on the call. Again, our attorneys want this discussed and resolved before we continue any participation. I'm sorry. I really don't have anything to add to my email. Our attorneys just need to get this sorted out ASAP. You are welcome to call me if you like and I can answer any questions but I think a discussion within a group is not appropriate until our attorneys have met.

Thank you Reta.

Marjorie

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Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----

From: Reta Lafort [mailto:rlafort@fs.fed.us]

Sent: Wednesday, July 21, 2010 12:06 PM

To: Blaine, Marjorie E SPL; Melinda D Roth; Robert Cordts; Beverley Everson

Cc: Tom Furgason; Brian Lindenlaub

Subject: Re: Rosemont

Marjorie - I still expect that you will join the call as scheduled. Even though you may not be able to discuss mitigation, I would like to continue discussion of your meeting and the content of your email.

From: "Blaine, Marjorie E SPL" [Marjorie.E.Blaine@usace.army.mil]
Sent: 07/21/2010 11:54 AM MST
To: Melinda Roth; Reta Lafort
Cc: "Tom Furgason" <tfurgason@swca.com>; "Brian Lindenlaub" <blindenlaub@westlandresources.com>
Subject: Rosemont

Mindee and Reta

I left messages for you both but will send you a quick email.

I met with our attorneys this morning. Our chief attorney is a NEPA and a takings expert and our regulatory attorney is a NEPA and regulatory expert. They contend that NEPA requires the USFS to look at offsite alternatives...NEPA does not get into takings. So while your decision in the end "might" be limited by takings considerations, NEPA still requires you to look at the full array of alternatives including the alternative mineral resources proximal to the Rosemont ore body and other offsite alternatives. They would be most happy to have this discussion with your attorneys and wonder if we can schedule this for either August 3, 4, or 5th...a telecon is probably the best.

To that end, they have advised me that, until this is settled and agreed upon, we cannot participate in any meetings regarding mitigation, etc. so I will not be in the call today.

Finally, I did a quick look at the revision of Chp 1 and find it to be really problematic as did our attorney. I will be giving you comments but your purpose and need are still very unclear and our comments were not appropriately incorporated. Again, I'll provide you our detailed comments next week as promised.

I look forward to your call or email confirming one of those dates for our attorneys and us to meet.

Thank you very much.

Marjorie Blaine
Senior Project Manager/Biologist
U.S. Army Corps of Engineers
Tucson Project Office, Regulatory Division
5205 E. Comanche Street
Tucson, AZ 85707
(520)584-1684 (phone)
(520)584-1690 (fax)

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"Blaine, Marjorie E SPL "
<Marjorie.E.Blaine@usace.ar
my.mil>

08/10/2010 04:57 PM

To "Tom Furgason" <tfurgason@swca.com>

cc "Melinda D Roth" <mroth@fs.fed.us>, "Reta Laford"
<rlaford@fs.fed.us>

bcc

Subject RE: Comments on DEIS

History: This message has been forwarded.

Thanks, Tom. It's a moving target, eh? But the important part is that we keep moving forward. I hope my changes did not cause any delays.

Marjorie

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-----Original Message-----

From: Tom Furgason [mailto:tfurgason@swca.com]

Sent: Tuesday, August 10, 2010 4:09 PM

To: Blaine, Marjorie E SPL

Cc: Melinda D Roth; Reta Laford

Subject: RE: Comments on DEIS

Marjorie,

Thank you for copying me on this email. Your timing is perfect because we are working on incorporating Cooperating Agency edits into Chapter 1 this week.

Tom

-----Original Message-----

From: Blaine, Marjorie E SPL [mailto:Marjorie.E.Blaine@usace.army.mil]

Sent: Tuesday, August 10, 2010 4:07 PM

To: Tom Furgason

Subject: FW: Comments on DEIS

FYI.

Marjorie

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Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----

From: Blaine, Marjorie E SPL

Sent: Tuesday, August 10, 2010 4:07 PM

To: Melinda D Roth; Reta Laford

Cc: 'Brian Lindenlaub'

Subject: Comments on DEIS

Mindee:

After further in-house conversations and considerations, we have decided to somewhat limit the area for consideration of offsite alternatives. Therefore, we respectfully request that our overall project purpose as stated within lines 280-283 in the draft of Chp 1 read:

The overall project purpose is to mine copper using conventional open pit mining and sulfide (mill and concentrate) and oxide (leach and SX/EW) ore processing for the purpose of producing copper and/or copper precursors, silver, and molybdenum within the mining district of southeastern Arizona (Pinal, Gila, Greenlee, Graham, Cochise, Santa Cruz, and Pinal Counties) ".

We would appreciate it if you would substitute the above overall project purpose in place of that submitted in our letter of August 5, 2010. Thank you very much.

Marjorie Blaine
Senior Project Manager/Biologist
U.S. Army Corps of Engineers
Tucson Project Office, Regulatory Division
5205 E. Comanche Street
Tucson, AZ 85707
(520)584-1684 (phone)
(520)584-1690 (fax)

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<<http://per2.nwp.usace.army.mil/survey.html>>

Note: If the link is not active, copy and paste it into your internet browser.

#17?
detail in Table 6?

Table 5/6 - Pepper/Burton letter? submittal count - 1 or 55?
25 form letters - split up into sub-categories?
more narrative?

Reta Laford /R3/USDAFS
07/27/2009 01:10 PM

To "Tom Furgason" <tfurgason@swca.com>
cc "Beverley A Everson" <beverson@fs.fed.us>, "Charles Coyle" <ccoyle@swca.com>, Melinda D Roth/R3/USDAFS@FSNOTES, Reta
bcc
Subject SWCA Action Requested Scoping Report 1 & 2 -Re: FW: fig1

- 1) I agree with Mindee, please use option B (which has the FS lands dotted).
- 2) Spent time with Mindee Friday reviewing draft Scoping Reports . I apologize for not connecting with you as planned . Below are the results of our discussions . I can meet with you by phone or in person as needed later today /tonight.
 - 2a) Use the following title tag line "A Proposed Mining Operation in Southern Arizona"
 - 2b) Scoping Report 1, page 4, line 5 (Framework for Scoping section), change "Subsequent to enacting 40 CFR 1501.07 . . ." to "Subsequent to enacting 40 CFR 1500 . . ."
 - 2c) Scoping Report 1, page 8, line 5 (Project-specific Website section), it is still unclear as to whose website is being referred to . Is it Rosemont's or the Forest's? Confusion stems from preceding sentence that refers to Rosemont 's web site. Reword for clarity.
 - 2d) Scoping Report 1, page 11, Table 4. Several Federal Agency names need to be corrected for accuracy and consistency . - Check names for accuracy . - List the following separated by commas: Department name, Agency name, Division (if any). For example:
 - i) OSM, BIA, BLM, BOR should be preceded with "Department of the Interior" not "U.S.",
 - ii) "Office of Surface Mining Reclamation" should be "Office of Surface Mining Reclamation and Enforcement",
 - iii) "Western Area Power Administration" is actually "U.S. Department of Energy, Western Power Administration",
 - iv) DOT and DOL should have a comma separating the department name from the Agency name.Note that these examples are not all inclusive , please do a stand alone check for accuracy and consistency.
 - 2e) Scoping Report 1, page 12 (Types of Response Submittals section), the bulleted list is redundant to the tabled information . Deleted bulleted list and preceding text ", including the following:"
 - 2f) Scoping Report 1, page 12, Table 5 (Types of Response Submittals section), change "Forest Service" to "Coronado".
 - 2g) Scoping Report 1, page 14, Table 7. Apply comments under 2d, above. Also please check that each Federal and State entity is accurately described in terms of Department, Agency, and Division (if any).
 - 2h) Apply any applicable comments above to Scoping Report 2.

Tom →

As soon as the above follow-up is done, email me the reports and I will forward to Region for their quick review.

Rept. # 3?



"Tom Furgason"
 <tfurgason@swca.com>
 08/30/2010 02:35 PM

To "Melinda D Roth" <mroth@fs.fed.us>
 cc
 bcc

Subject FW: Pit contours

History: This message has been replied to and forwarded.

Mindee,

Attached are the end of year 19 pit contours that Pima County requested.

Tom Furgason

Office Director
 SWCA Environmental Consultants
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PROJECT MEMORANDUM ROSEMONT EIS PROJECT

To: Tom Furgason (SWCA)
Copy to: Charles Coyle, Melissa Richard (SWCA)
From: Dale Ortman PE
Date: 21 June 2009
Subject: **Tailings & Waste Rock Relocation Alternative Development**

This memorandum was prepared at the request of SWCA to summarize the preliminary development of the tailings and waste rock relocation alternatives for the proposed Rosemont Copper Project. The CNF IDT, meeting on May 20, 2009, developed and recommended seven draft alternatives for possible inclusion in the Rosemont EIS. The seven preliminary draft alternatives are itemized in the May 26, 2009 memorandum *Interdisciplinary Team's Draft Alternatives* from Tom Furgason (SWCA) as follows:

- Alternative A – Proposed Action (MPO 2007)
- Alternative B – No Action
- Alternative C – Rosemont's Proposed Alternative (Rosemont 2009)
- Alternative D – Alternative C + Mitigation + Tailings Slurry pipeline to Sycamore Watershed and Waste Rock located in McCleary, Wasp and possibly spilling into Upper Barrel Canyons
- Alternative E – Alternative C + Mitigation + Tailings Slurry pipeline to Scholefield Canyon and Waste Rock located in McCleary, Wasp and possibly spilling into Upper Barrel Canyons
- Alternative F – Alternative C + Mitigation + Tailings Slurry pipeline to Sections 7 and 8 and Waste Rock located in Scholefield Canyon
- Alternative G – Alternative C + Mitigation + Tailings Slurry pipeline to Upper Wasp going into Upper Barrel Canyons and Waste Rock located in McCleary and Scholefield Canyons

Of these alternatives the last four, namely Alternatives D, E, F and G, all involve the relocation of the dry stack tailings and waste rock disposal/heap leach facilities to sites other than the combined Barrel and McCleary canyon site proposed by Rosemont in both Alternatives A and C. During the alternative evaluation process prior to the May 20 IDT the potential impact to visual resources was the primary driver for the development of alternatives involving relocation of tailings and waste rock. However, at the May 20 IDT meeting the IDT concluded that additional drivers for alternative development were the archeological, heritage site, riparian habitat, and recreational resources primarily located within the footprint of the proposed tailings and waste rock/heap leach facilities in Barrel Canyon. Therefore, the fundamental driver for possible alternatives relocating the tailings and waste rock facilities was to move them out of the Barrel Canyon drainage.

In response to the driver to relocate the tailings and waste rock/heap leach facilities so as to eliminate or substantively reduce the placement of mine waste in Barrel Canyon the IDT developed four possible siting alternatives, all of which meet the IDT's fundamental objective of eliminating or substantively reducing the direct impact to the Barrel Canyon drainage and its archeological, heritage site, riparian habitat, and recreational resources. Following the May 20 meeting and the subsequent memorandum of May 26 the CNF requested that SWCA evaluate the possible waste relocation siting alternatives with regard to capacity and potential layout and report the finding to the IDT. In reviewing the four possible waste relocation alternatives developed by the IDT it was determined that they included the following siting options, each of which was evaluated for potential layout and capacity relative to the required tailings, waste rock, and heap leach facility volumes as indicated in the MPO (Table 1).

- Scholefield Canyon as either a potential tailings disposal or partial waste rock disposal and heap leach facility site;
- McCleary Canyon as a potential waste rock disposal and heap leach facility site;
- Upper Barrel Canyon as either a potential tailings disposal or partial waste rock disposal and heap leach facility site; and
- Sycamore Canyon, including parts of Sections 7 and 8, as a potential tailings disposal site.

Table 1 – Required Mine Waste Volume

Mine Waste Material	Waste Tonnage (million dry tons)	Unit Weight (pounds/cubic foot)	Waste Volume (million cubic yards)
Tailings	596	109	405
Waste Rock	1,228	125	763
Heap Leach	75	125	44
Waste Rock + Heap Leach	1,303	125	808

The layout and capacity evaluation included the following additional criteria:

- Sideslope = 3.5v:1h;
- Contour interval used for volume estimation = 200 feet;
- Maximum elevation of facilities to be less than or approximately equal to the elevation of the Santa Rita Mountains adjacent to the facility;
- Heap leach facility assumed to be contained within the waste rock disposal facility;
- Tailings must be disposed in a single facility so as to eliminate multiple tailings filter plants; and
- Waste rock may be disposed in one or more facilities.

The general results of the capacity evaluation are summarized below and in Table 2 and the site locations are indicated on Figure 1.

Scholefield Canon

The Scholefield Canyon site includes the three un-named drainages north of and tributary to Scholefield Canyon upstream of Hidden Valley Ranch. The layout shown on Figure 1 has an estimated total volume of 441 million cubic yards; capable of containing all the required 405 million cubic yards of tailings and an allowance for the waste rock buttress, or approximately half of the waste rock and heap leach material.

McCleary Canyon

The McCleary Canyon site (Figure 1) has an estimated volume of 902 million cubic yards; capable of containing all the required 808 million cubic yards of waste rock and heap leach material.

Upper Barrel Canyon

The Upper Barrel Canyon site includes two options (Figure 1) with estimated volumes as follows:

- Option 1 – 199 million cubic yards, capable of containing a quarter of the waste rock including all of the heap leach facility; and
- Option 2 – 402 million cubic yards, capable of containing approximately half of the combined waste rock and heap leach material or, with marginal increase in size, all of the tailings with an allowance for a waste rock buttress.

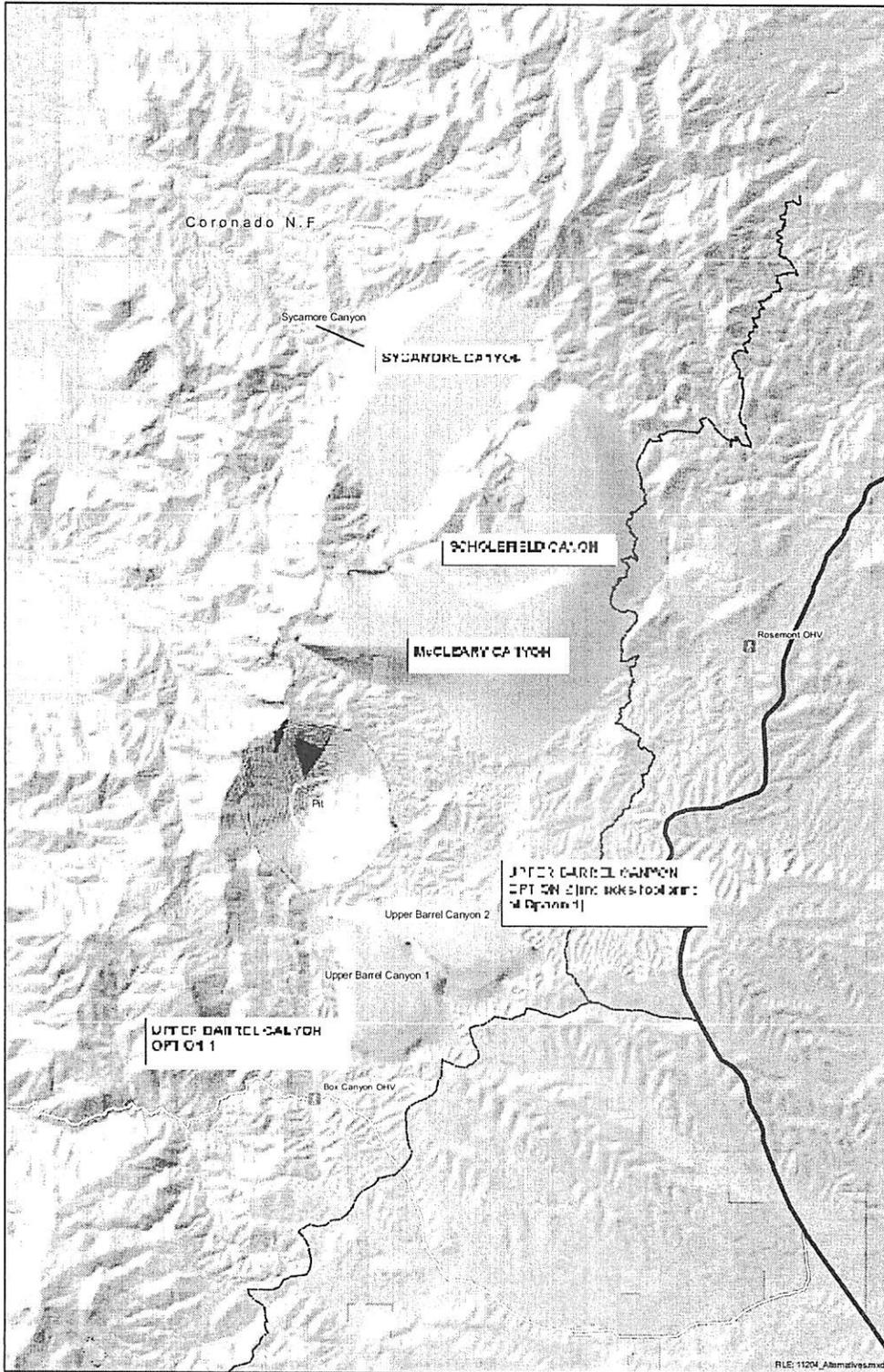
Sycamore Canyon

The Sycamore Canyon site, on the west side of the Santa Rita Mountains (Figure 1), has an estimated capacity of 490 million cubic yards; capable of containing all the tailings. However, due to the distance from the mine pit and the unattractive option of a 150-foot wide haul road over the Santa Rita's to transport waste rock from the mine it is unlikely this tailings disposal alternative would include the 150-foot thick waste rock buttress incorporated in the MPO.

Table 2 – Waste Relocation Site Capacities

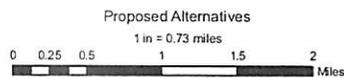
Site	Estimated Capacity (million cubic yards)	Tailings Capacity (%) (¹)	Waste Rock + Heap Leach Capacity (%)
Scholefield Canyon	441	109	55
McCleary Canyon	902	200	112
Upper Barrel Canyon Option 1	199	49	25
Upper Barrel Canyon Option 2	402	99	50
Sycamore Canyon	490	121	Not Applicable

⁽¹⁾ Not including allowance for waste rock buttress



- Legend**
- RecPoints
 - State Highway
 - Scenic/Sightseeing Route, Arizona Trail
 - Scenic/Sightseeing Route, Box Canyon Road (FR62)

- Landownership**
- BLM
 - Private
 - State
 - USFS



DATE: 6/19/2009

FIGURE 1 - MINE WASTE RELOCATION SITES



Jeanine Derby/R3/USDAFS
01/21/2010 02:05 PM

To Melinda D Roth/R3/USDAFS@FSNOTES
cc Reta Laford/R3/USDAFS@FSNOTES
bcc
Subject Re: Public Participation Planning Meeting Jan 25th 

do you need to line up mailing help? Roxanne??

Jeanine Derby, Forest Supervisor
Coronado National Forest
phone: 520 388-8306
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Melinda D Roth/R3/USDAFS



Melinda D Roth/R3/USDAFS
01/21/2010 01:09 PM

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cc Jeanine Derby/R3/USDAFS@FSNOTES, Melinda D
Roth/R3/USDAFS@FSNOTES
Subject Public Participation Planning Meeting Jan 25th

We're on for Monday, Jan. 25th from 1:00 to 3:00 in room 6V6 at the federal building to brainstorm the topic of public notices, meetings, etc for the DEIS rollout to the public. Please feel free to extend this invitation to others as needed. The postcard query to determine EIS numbers and formats for publication will also be discussed so it can move forward. Thx.

Tom, Would you consider having Melissa attend? She has a wealth of background from Mar-July 2008.

Mindee Roth
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Chapter 2 Draft
6-21-10



"Tom Furgason"
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<mreichard@swca.com>, "Dale Ortman PE"
<daleortmanpe@live.com>

bcc

Subject Rosemont DEIS Chapter 2_06202010_CE.docx

Bev,

Attached is our revised Chapter 2 for your review. I would consider this draft about 50 percent complete. We are still waiting for:

- Detailed information from Rosemont regarding the Upper Barrel Only Alternative;
- GIS data and graphics (some needs were only identified this week and we'll be submitting another request to Rosemont this week);
- Finalization of the mitigation measures (CNF and RCC);
- Finalization of Compensatory Land Mitigation (CNF and RCC);
- Monitoring Plan (Westland);
- Utility Line Alternative Development and Descriptions (RCC and EPG);
- Water Source Alternative evaluation (SWCA); and
- Numerous other small project details (e.g. description of fencing, acres fenced, etc.).

We have been using the Idaho Cobalt EIS as our template; however, I have been reviewing the Rock Creek Mine EIS and I think that they did a better job with introducing issues and on Alternatives Considered but Dismissed. I'll bring examples of the latter to tomorrow's meeting for discussion, but I'd like to follow their example more than Idaho Cobalt.

Finally, this draft is still very rough. However, it is still substantially revised and warrants review to ensure that we are on track with the direction that we are taking. I would like to discuss another interim submittal when we meet tomorrow. The interim submittal date should be tied to the finalization of mitigation and receipt of graphics from Rosemont. We'll see you tomorrow at 9:30.



Tom Rosemont DEIS Chapter 2_062110_CE.pdf Rosemont DEIS Chapter 2_06202010_CE.docx

My notes to Tom 6-25 + 6-30.

proposals for agency action. Agencies then look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment.

With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decisionmaking. (36 CFR 220.4 (f))

15.2 - Bounding Effects

Spatial and temporal boundaries are the two critical elements to consider when deciding which actions to include in a cumulative effects analysis. Spatial and temporal boundaries set the limits for selecting those actions that are most likely to contribute to a cumulative effect. The effects of those actions must overlap in space and time for there to be potential cumulative effects.

15.2a - Spatial Boundaries

Spatial boundaries define the affected area for each resource indicator. **The affected area is the area in which a specific resource may be affected by management actions; whether they are past, present, or future. Affected areas can vary in size by resource and by the type of effect that may occur.**

For example, the affected area for soils in a timber thinning operation would typically be the harvest units where soils are directly disturbed. However, the affected area for elk habitat may be an elk management unit that takes in several watersheds.

Because affected areas are resource dependent, they generally have boundaries that are physical or biological rather than political. Water quality in a river may be affected by actions on National Forest System, Bureau of Land Management, State, and private lands within the same watershed.

15.2b - Temporal Boundaries

In addition to identifying the affected area for each resource, it is important to also understand how the proposed action may interact with other past, present and future actions across time to produce cumulative effects. The time frames used depend on the duration of effects that the actions produce on the affected resource. For example, a fence can be constructed in a matter of days, but the effects from that fence on cattle or big game movement may last 20 years or more.

Past actions and events also need to be analyzed to determine how the present situation has been affected by history, and to identify trends or patterns that may exist. The objective of doing this is to establish a baseline for assessing future events. The no-action alternative can be an effective benchmark if it incorporates cumulative effects of past activities and accurately depicts the condition of the environment.

It is important to explain why discernible cumulative effects are not expected beyond the spatial and temporal boundaries of the affected area. Exhibit 01 shows how space and time boundaries of effects must overlap to be considered in the cumulative effects analysis.

15.3 - Cumulative Effects Framework

When appropriate, the following framework should assist in the development of a meaningful

Rosemont Copper Project

Review of Alternatives Considered but Dismissed

**Report Prepared for
SWCA Environmental Consultants**

Report Prepared by



December 16, 2009

Rosemont Copper Project – Review of Alternatives Considered but Dismissed

SWCA Environmental Consultants

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SRK Project Number 183101

December 16, 2009

**Authors
Listed within Document Sections**

**Reviewed by
Corolla Hoag, P.G.
Ken Black, P.Eng.**

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1 Introduction

SWCA and Mr. Dale Ortman, P.E. (Ortman, 2009) provided SRK Consulting (U.S.) Inc. (SRK) with a scope of work (SOW) for performing a two-phase evaluation of Alternatives Considered but Dismissed (ACD) for the Environmental Impact Statement (EIS) for the proposed Rosemont Copper Project. The request was made at the behest of the U.S. Forest Service, Coronado National Forest (CNF), which previously reviewed these alternatives and dismissed them for various reasons. The initial Phase I SOW consists of evaluating 16 ACDs for technical and practical feasibility and preparing draft and final reports. The number of ACDs subsequently was reduced to 11 alternatives. Phase 2 consists of a subsequent financial feasibility evaluation for those ACDs (if any) that have the potential to be technically and practically feasible. This report describes the Phase I scope of work.

In accordance with the Phase I SOW, SRK evaluated each ACD for technical and practical feasibility on the basis of expert professional judgment and knowledge of the specific scientific and engineering aspects of the alternative. Additionally, each evaluation included a review of documents pertinent to the ACD and the current Mine Plan of Operations (MPO) (WestLand Resources, 2007).

This report is organized into 14 sections, as follow: Introduction; ACD Technical and Practical Evaluations (11 Sections); Summary, which summarizes the technical and practical feasibility of the alternatives and alternatives for further consideration; and References.

1.1 Base Case Method for Mine Operation

Rosemont has proposed an open pit operation as the main method to mine the oxide ores and sulfide ores (WestLand Resources, 2007). This mining method would involve:

- Mining and placing approximately 1.23 billion tons (Tetra Tech, 2009, p. 19, Table 4.01) of overburden and non-mineralized limestone and other rock types in waste rock dumps on cleared and grubbed areas southeast, east, and northeast of the proposed pit;
- Mining of the approximately 69 million tons of low-grade oxide ore and subsequent placing of the ore on a leach pad, followed by acid leaching and solvent-extraction electrowinning (SX/EW) to produce cathode copper;
- Mining of the 546 million tons sulfide ore by blasting and haulage, followed by crushing, milling, flotation, and production of copper concentrates with silver credits, and molybdenum concentrates;

- Placing of the approximately 546 million tons of dry-stack tailings on a stripped and grubbed tailings disposal area in McCleary and Barrel Canyons, and accomplishing reclamation by an engineered cover;
- Building infrastructure would be used to assist production, including access roads, parking areas, fencing, power lines, process buildings, maintenance shops, and administrative buildings; and
- Shipping 1,328 tons per day of copper and molybdenum concentrates by truck and then truck or rail for further processing.
- Shipping a total of 19,000 tons of copper cathodes by truck and then truck or rail.

The metals of value recovered include copper, molybdenum, and silver.

1.2 ACD Technical and Practical Evaluations

Sections 2 through 12 provide the evaluations of the ACDs. Following the ACD title and author(s), each section contains of the following subsections:

- ACD Description,
- Technical Feasibility,
- Practical Feasibility,
- Consequences,
- Summary, and
- Qualifications of Responsible Personnel

2 Dispose of Tailings and Waste Rock on the West Side of Santa Rita Mountains

The following section on disposing of tailings on the west side of the Santa Rita Mountains instead of on the east side of the mountains was prepared by Corolla K Hoag, R.G. and reviewed by Ken Black, P.Eng.

2.1 ACD Description

The MPO proposes to transport 1.23 billion tons of overburden and non-mineralized waste rock and 546 million tons of dry stack tailings for disposal adjacent to the Open Pit (Tetra Tech, 2009, p. 19, Table 4.01). The waste rock will be transported by 250-ton haul trucks; the tailings material will be placed in Barrel and McCleary canyons using a conveyor and radial stacking system. The transport distance for waste rock is a lateral distance of approximately 7,400 feet from the pit center to the waste rock dump center; the transport distance for tailings as is approximately 8,800 feet (Arnold, 2009, p. 3, Updated Summary Table).

This ACD would select an alternate location for disposal of the dry stack tailings and waste rock west of the ridge crest of the Santa Rita Mountains instead. The intent of this ACD is to minimize surface disturbance impacts at the proposed mine area. No change to the production schedule is proposed for this ACD although the change in location would have an effect on operational costs (not evaluated) that may impact the life-of-mine (LOM) reserves. No alternate location was identified by SRK during this brief review, but the transport distances would range from approximately 10 to 20 miles.

2.2 Technical Feasibility

The land position on the east side of this range primarily consists of land controlled by the State of Arizona (surface and minerals) with lesser ownership by CNF, private parties, and the U.S. Bureau of Land Management (BLM) in descending order. Finding an alternate location for the tailings and waste rock on the west side of the Santa Rita Mountains is technically feasible. A siting study would need to be performed to identify one or more potential tailings and waste rock dump locations from an engineering perspective, and conceptual engineering designs would need to be prepared. It can be assumed that because of water restrictions the tailings would still be deposited as a dry stack with waste rock used to buttress and protect the outer slopes. The topographic features most ideal for this design of dry stack tailings disposal include gently sloping topography or low-lying areas within a drainage. Waste rock can be placed on gently to moderately sloping topography and within incised drainages. In addition to performing an engineering options analysis for selecting an alternate tailings location, Rosemont Copper would also need to adhere to state and federal permitting requirements that require an evaluation to identify the environmentally least damaging alternative.

Transporting large quantities of run-of-mine waste rock and tailings material to the selected location west of the ridge crest would require operation of an extensive truck fleet along an existing or potentially new road, operation of a short-haul rail line to a transfer station to transport the waste to the final disposal location, or operation of a large conveyor system with a radial stacker system to place the material in the final location.

2.3 Practical Feasibility

Viable alternate waste disposal locations have already been identified on the east side of the mountains in Barrel Canyon only and/or a combination of McCleary and Schofield Canyons. These alternatives will undergo a full evaluation from an engineering, biological, and archaeological perspective, and for other considerations such as impacts to water resources. No alternative locations with an equivalent degree of engineering, biological, or cultural studies currently exist on the west side of the mountains.

The amount of waste material to be moved, the large size fractions of the run-of-mine material, and distances involved would exceed the capacity of a large truck fleet to move the waste and tailings material efficiently. Typically, the number and size of trucks required to move ore and waste materials is determined through optimization studies that incorporate the height of the benches, the capacity of the shovel and/or loader bucket, the truck haulage capacity, haulage distances and elevation profile, and the time needed to make a return trip to the shovel. Given the very long haul distances to transport waste rock to the west side of the mountains, the number of trucks required for waste rock disposal would increase significantly over what is planned in the MPO and may include an large fleet of high-tonnage, off-road haulage trucks and large commercial trucks using the highway system. This would, in turn, increase diesel fuel consumed, generate higher dust and air quality emissions, and accelerate the wear on the trucks and tires. Truck disposal of waste and tailings material to an alternate location on the west side of the Santa Rita Mountains is not practically feasible.

Conveyor systems could be designed to transport tailings and crushed waste rock to the distances proposed for an alternate location west of the ridge crest. The main considerations are increased water usage for fugitive dust suppression, increased energy use to crush the run-of-mine waste rock to a consistent size fraction for the conveyor, the increased energy use to convey the material to significantly greater distances, and the greater surface impacts to include the lengthy conveyor and maintenance support access.

2.4 Consequences

The consequences of locating the tailings disposal on the west side of the Santa Rita Mountains include the following:

- The relocation would have no impact on the 69 million tons of oxide materials proposed for heap leaching adjacent to the Open Pit.
- Relocated waste materials would have no impact on the size of the surface footprint of the tailings and/or waste rock facilities unless the resulting operational costs are excessive and significantly decrease the LOM reserves.
- The impacted surface area will increase owing to the increased distance of the conveyor system and companion maintenance road(s).
- Fugitive dust related to the conveyor system and maintenance vehicles will increase owing to the increased travel distances along a longer conveyor route.
- Water usage will increase to support dust suppression on the conveyor system and companion maintenance roads (if they are all-weather graded dirt roads).

- Electric energy use and related emissions will increase owing to the increased conveyor distances and the need to crush the run-of-mine waste rock to a more uniform size fraction.
- Tailings and waste rock would not be visible on the east side of the ridge crest or from State Route 83 (SR83) resulting in an improvement in the viewshed.
- Tailings and waste rock would be visible from the west side of the ridge crest and from Interstate-19 (I-19) resulting in a degradation of the current viewshed.

2.5 Summary

The land ownership on the west side of the mountains is a mix of private, county, state, and federal with associated restrictions and permitting requirements. An alternate disposal site for tailings and/or waste rock material west of the ridge crest of the Santa Rita Mountains could be identified through an industry standard siting evaluation. Increased water and fuel usage, increased dust and air quality pollutants, and a degradation of the viewshed are expected outcomes. No reduction to the footprint of the facilities will be generated other than those caused by excessive costs and a decrease in the LOM material that can be economically extracted, processed, and transported to the final disposal location. In SRK's opinion, this ACD, although potentially technically feasible, is not a practical alternative.

2.6 Qualifications of Responsible Personnel

The author of this section, Corolla Hoag, R.G., M.Sc. has a degree in economic geology and has worked for more than 23 years in the exploration, mine development, and consulting industry. The discussion in this section was based on general observances and knowledge gained at mining operations where the author has worked including Cyprus Copperstone, Cyprus Tohono, BHP Copper San Manuel Operations, BHP Copper Florence Project, Phelps Dodge (now Freeport-McMoRan) Sierrita, and conclusions from SRK mine planning and/or optimization studies at ASARCO Ray Complex, ASARCO Mission Complex, and Silver Bell Mining.

3 Mechanical Conveyance of Ore to Rail Head

The following section on mechanical conveyance of “ore” to a rail head was prepared by Kenneth P. Black, P. Eng. (Mining) and John Kline, B.S., MAOM.

3.1 ACD Description

The base case in the Rosemont MPO is to crush and concentrate ore minerals on site and ship the copper sulfide and molybdenum sulfide concentrates for off-site smelting via commercial trucks. This proposed ACD reviews using other mechanical conveyances to ship ore and concentrates off site. The intent is to reduce the footprint of plant facilities on the mine site and to reduce traffic on the nearby highways. This proposed alternative evaluated two aspects of mechanical conveyance of *ore* to the Port of Tucson railhead for shipment to an off-site location for crushing and processing to prepare concentrates, and subsequent shipment to smelter markets within or outside the state of Arizona. Additionally the evaluation includes the conveyance of *concentrates* to the railhead at the Port of Tucson. It is believed the intent of the ACD is really to address copper concentrate shipments and not ore for reasons that will be addressed in the next section.

3.2 Technical Feasibility

This section will discuss the technical feasibility of transporting materials from the proposed mine site by truck haulage, rail haulage, conveyor haulage, and slurry pipeline. No economic consequences are discussed or included.

The Port of Tucson is located in a federally designated foreign trade zone in south Tucson (near Interstate-10 and S. Kolb Road) and consists of railroad interchange facilities to provide on/off loading from rail cars to and from highway transport vehicles. The Port of Tucson is a Union Pacific terminal for freight forwarding to and from Mexico. The term “Port” in this case refers to a point of entry and exit and not to a location for ocean transport via large ships. A SRK inquiry to the Port of Tucson on whether concentrates would be accepted for transport generated the response that the Port of Tucson has previously accepted and shipped bagged copper concentrates for shipment. To SRK’s knowledge the only nearby ship ports with rail and ocean transport capabilities that will accept concentrates are in Guaymas Sonora, Mexico and in Vancouver, Washington; concentrates are not accepted in Long Beach, California or Corpus Christy, Texas because of environmental restrictions.

Method 1: Truck Haulage

Mined ore cannot be shipped via truck or conveyor without crushing and resizing the run-of-mine material. Run-of-mine ore would exceed highway truck capacity in size. Crushing and conveying facilities would not change from the planned size stated in the MPO. The haul truck fleet would not be reduced either. The balance of this discussion, therefore, will include only transportation of concentrates.

Truck haulage of copper and molybdenum concentrates by common carrier is the normal transportation method in Arizona and is the base case in the Rosemont MPO. The truck haulage method is used by ASARCO Mission to take copper concentrates to the ASARCO Hayden smelter for processing and by the Freeport-McMoRan's Bagdad and Sierrita operations to take their concentrates to the Freeport-McMoRan smelter at Miami, Arizona. Prior to the cessation of operation in early 2009, BHP Copper's Pinto Valley Operation shipped concentrates via commercial truck to the rail transload facility in San Manuel, Arizona for final processing overseas.

Method 2: Rail Haulage

Rail haulage of ore is currently used at ASARCO Ray Complex to transport sulfide ore from a primary crusher at Ray Mine via ASARCO's Copper Basin Railway to the company's mill, concentrator, and smelter facilities located at Hayden approximately 20 miles away. The available siding area limits the train to approximately 40 cars. Rail haulage of ore was previously used at the BHP Copper San Manuel Mine to take sulfide ore from the primary crusher at the mine to the company's mill/concentrator and smelter located 7 miles to the south at the town of San Manuel. At Rosemont, rail haulage of ore is technically feasible assuming a mill-concentrator can be secured elsewhere to process the sulfide ore. This method would require a short-line rail spur and siding area to be built at the proposed plant facilities (and potential receiving facilities) for transporting ore for off-site processing.

Rail haulage is an effective way to move bulk materials such as concentrates. Binding materials are applied to reduce wind-blown losses from uncovered rail cars but some losses still occur. The transportation of concentrates to the Port of Tucson is technically feasible by rail haulage, but requires installation of a rail spur to the site (with attendant surface disturbance) and installation of rail loading facility adjacent to the mill/concentrator and other plant facilities.

Method 3: Conveyor Haulage

Conveyors were evaluated as a mode of transporting materials. This approach allows for the conveyance of crushed ore and concentrates along the 12-mile access corridor from the mine

to a railhead near Exit 281 on I-10 and directly loading the ore onto 100-car rail trains. As mentioned previously, this method is not technically feasible without processing the ore through a crushing circuit to reduce the size of the run-of-mine material. Additionally direct loading is not technically feasible as each car would likely be filled in less than 2 minutes but it would take longer yet to shunt the rail cars into position for loading. Additional facilities including storage bins would need to be constructed at the railhead on the north side of I-10 or at the Port of Tucson to control automated loading of all cars. The mechanical conveyance of ore to the Port of Tucson is not technically viable. Again, it is believed the intent of the ACD is to address copper concentrate and not ore.

Conveyors are can be an effective method to transport coarse to fine-grained materials and will be used to transport the dewatered, dry stack tailings at Rosemont (primarily coarse sand to silt size). Concentrates are the final recovered residue from the crushing, grinding, and flotation circuit and the particles are typically silt to ash size. Operation of a conveyor with direct loading capabilities at a railhead or the Port of Tucson is not technically feasible. Construction and operation of additional facilities to control automatic loading would be required.

Method 4: Slurry Pipeline

Slurry pipelines are a common means of transporting products including copper concentrates. The Escondida Mine in Chilean Andes pumps copper concentrate hundreds of kilometers to Antofagasto, a port city on the coast of Chile. Antamina mine in Peru has a similar production rate and it slurries the concentrates by a 300-kilometer (km) pipeline to the Pacific coast where the concentrates are filtered prior to loading onto a ship. (Xstrata Copper, 2009). At the terminus of the pipeline, the slurried concentrate would be dewatered in a filter plant and dried to 8 percent moisture content for rail car shipment or containerized ocean transport shipment to a smelter facility. The concentrates would be stockpiled in a covered building prior to loading the material on rail cars for shipment to smelters. Water treatment may be required before returning the clarified water via pipeline back to the proposed mine site.

This method requires the off-site construction of: a plant to receive and filter/dewater the concentrates, a pump station to recycle the water, concentrate storage building(s), pond(s) for water impoundment prior to pumping back to the mine site, and a transload facility for loading of rail cars. The net result is two pump lines are required, namely one to send and one to receive the liquids. The slurrying of concentrates in a solid/liquid phase and their subsequent transport over long distances is common industry practice especially for mining facilities that are at a significant distance from the smelter/refinery complex. It is technically

feasible assuming off-site dewatering, water treatment/pumping, and transload facilities can be constructed and operated.

3.3 Practical Feasibility

This section discusses the practical feasibility of conveying concentrates to the Port of Tucson for transload into rail cars. The transport of *ore* will not be discussed here for the reason previously stated. Many of the methods of conveyance are technically feasible but not practically feasible as discussed below.

It is common for coarse materials to be transported over long distance by conveyors. The longest conveyor system in the world transports phosphate from a mine in Western Sahara 100 km to a Moroccan port (Wikipedia, 2008). The transport of fine-grained concentrates from the proposed Rosemont processing plant to a storage facility adjacent to the Southern Pacific rail line at Exit 281 is impracticable. The concentrate would have to be filtered and dried to a reasonable moisture content to be conveyed. Windblown loss related to the drying process and the small particle size of the concentrate is difficult to prevent and manage. Normal conveyor covers are not currently designed to handle these small particle sizes on a practical level; no example could be found where this method is used. New and innovative equipment would have to be developed. Potential environmental degradation coupled with the long distance of conveyance make this option impracticable.

Construction of a rail spur to transport copper and molybdenum concentrates to the Port of Tucson rail facility is technically feasible, but is considered impractical here. Construction of rail spur would require obtaining a right-of-way, building a railway siding and loading facility at or near the mine, and would add to the environmental impacts. It is believed an element of the ACD proposal was to reduce impacts and footprint of the Rosemont operations. The addition of a rail spur would result in substantial land disturbance.

Slurry pipelines are a common means of transporting copper concentrates where other options are not practical. Operation of a slurry pipeline introduces risk to the environment owing to the potential for loss of the slurry owing to pipeline breakage or damage. No off-site facility near the proposed mine site or Tucson has been identified for the construction of the required concentrate filtration plant, water treatment plant, water recycling pump station, and transload facilities. This option is therefore considered impracticable.

3.4 Consequences

As previously discussed, the transportation of run-of-mine ore is not a viable alternative. The discussion of consequences will be limited to alternate transportation methods for concentrates.

- Alternate means of transporting concentrates may result in increased energy and water consumption for fugitive dust control.
- Risk of environmental damage may be increased due to spillage, wind-blown dust, and/or pipeline failures.
- Rights-of-way will be required to allow construction of the proposed alternatives.
- The alignment of the proposed alternatives may cross state trust land, private land, riparian areas, and waters of the U.S., the environmental impacts of which have not been evaluated.

3.5 Summary

The various mechanical conveyances for ore and concentrates have been evaluated. The conveyance of *ore* off site by various mechanical means is not technically or practically feasible due to the sheer volume and size of the material to be transported to other facilities for treatment.

Alternatives for the conveyances of concentrates from the mine using rail haulage are technically feasible from an engineering perspective. Direct, automated load of concentrates from conveyor However, some alternative alignments may not be viable owing land ownership or environmental aspects relating to alignment.

3.6 Qualifications

Kenneth Black, P.Eng. has a degree in mining engineering and has worked for 35 years in the mining industry as a mine manager and project manager; additionally he has technical expertise in the branches of mining related to environmental permitting and mining operations. His specific work experience includes:

- Mine manager of an open pit operation;

- Permitting and technical design for the Crandon Project;
- Permitting and environmental manager at numerous operating sites;
- Environmental assessment reviews of numerous mines in North America and South America; and
- Closure Manager of BHP Billiton's sites in Canada.

John Kline, BS, MAOM, has a degree in chemistry and has worked for 35 years in the copper mining industry as technical manager, environmental permitting, operations managers, and project manager. His specific work in the field of mechanical conveyance of ore and/or concentrates includes:

- Project Manager to facilitate and transport 400,000 of copper concentrates to and from the Port of Guaymas, Sonora, Mexico.
- Experience with evaluation and permitting of rail transload facilities in Arizona and Mexico.
- Health, Safety, and Environmental Manager at Pinto Valley and San Manuel Operations where truck haulage and rail transload facilities were used to transport copper concentrates to the Port of Guaymas for final processing.

4 Use *In Situ* Leaching in Lieu of Open Pit Mining

The following section on using *in situ* leaching instead of open pit mining was prepared by John T. Kline, B.S., MAOM, and Corolla K Hoag, R.G.

4.1 ACD Description

The proposed ACD would consist of *in situ* leaching of the oxide and sulfide copper mineralization by a weak sulfuric acid solution followed by solvent-extraction and electrowinning (SX/EW) of the recovered copper with copper cathode as the final product. Cathode would be shipped to market by truck followed by truck or rail.

Infrastructure would include a series of injection and recovery wells, a network of solution pipelines, process ponds for raffinate and pregnant leach solution (PLS), a SX/EW plant, administration buildings, maintenance and warehouse buildings, power lines, fencing, surface roads, and parking areas.

4.2 Technical Feasibility

The use of an *in situ* mining technique as an alternative to open pit mining requires a review of several critical concepts. These include:

- The definition of *in situ* leaching versus in place leaching,
- The definition of oxide ore versus sulfide ore,
- Where *in situ* leaching has been used or tried,
- The material property of the material to be leached,
- The regional geologic setting, and
- Potential permitting requirements.

Definitions

“*In situ*” is Latin for “in place” and has been used to define two different types of mining: *in situ* and “in place.” *In situ* mining refers to the recovery of the metals without any significant disturbance of the rock matrix. Essentially, the rock matrix is in its native form and is accessed by drilling and leaching methods. Leach solutions, generally a weak sulfuric acid solution, are pumped into the ground via an injection well and subsequently travel through the fractures in the rock and dissolve the minerals. Recovery wells fitted with downhole pumps are installed to recover the metal-bearing solutions. With reference to copper *in situ* leaching, the copper-bearing solutions are pumped to a SX/EW plant where the copper is extracted and then electrically plated as copper cathode.

“In place” leaching refers to leaching of the metals in ground that has been disturbed by previous mining methods. This would include: leaching of pit walls where stress-relief has occurred due to blasting and mining operations, the walls of underground mine workings where the rock has been stress-relieved by blasting, and ore bodies that have been previously mined by underground block caving techniques. “In place” is often used instead of *in situ*. In this review, the author believes the intent of the alternative is to review *in situ* mining and not “in place” mining, with the goal of mitigating surface disturbance.

It is also necessary to understand the various ore types. “Oxide” may refer to several types of soluble copper minerals such as copper-bearing iron and manganese oxides, chrysocolla (a copper silicate mineral), cuprite (cuprous oxide), and chalcocite (a soluble copper sulfide mineral). The primary “oxide” mineral in the Rosemont ore is chrysocolla, but the ore also may contain a small amount of chalcocite. Some of the copper “oxide” minerals are less readily soluble than others. Chrysocolla is readily soluble but chalcocite copper, for example,

is only partially released in the presence of ferric iron and weak sulfuric acid. The oxide ore will not generally contain any soluble amounts of silver or molybdenum.

“Sulfide” generally refers to copper sulfide minerals that are not readily soluble in a weak sulfuric acid solution. The copper sulfide minerals at Rosemont are chalcopyrite, bornite, and molybdenite. All of the molybdenum and silver content is contained in the sulfide minerals (WLR Consulting, 2007, p. 10, 21).

There are a number of Arizona mining operations using “in place” copper mining, and pilot testing of “in situ” mining has occurred at several locations. There is no record of any recovery of molybdenum or silver from these types of mining methods, as will be explained in Section 2.1.3. Examples of the mines where “in place” and *in situ* leaching have been attempted are listed in Table 1.

In all of the tests and in all cases listed in Table 1, the criteria for success was the ability to pass a leach solution through the target ore and recover the copper in a manner consistent with permit requirements under the Arizona Department of Environmental Quality’s (ADEQ’s) Aquifer Protection Permit program. In the case of the Florence Project it also was necessary to meet the requirements of a U.S. Environmental Protection Agency (EPA) Class III well system, as regulated under the Safe Drinking Water Act. The goal of both regulations is to prevent degradation to drinking water sources of the U.S. This means the facility operator must demonstrate to the agencies that *in situ* leach solutions will not migrate beyond the leaching facility. The Florence Project is the only Class III copper leach system approved to date by the EPA. The other “in place” leach systems listed in Table 1 are considered Class V leach systems. The distinction is that Class III wells apply leach fluid under pressure and the fluid is recovered in nearby pumping wells. Hydraulic control of the leach solution is by injection and pumping. Class V wells utilize open pits, underground mine workings, and well systems for recovery. Hydraulic control is maintained by solutions migrating into previously mined areas.

Testing has also occurred on sulfide ore. These include:

- Laboratory column and bench-scale leaching tests, and
- Injection and pumping tests for flow characterization.

4.3 Practical Feasibility

This section will discuss the practical feasibility of *in situ* leaching of the oxide and sulfide ores. This discusses the use of *in situ* technology based upon similar conditions tested at other Arizona sites and the specific ore characteristics of the Rosemont mineralization. A review of available Rosemont data finds no mention of downhole permeability testing of the oxide ore

body as distinct from the sulfide ore body, so some assumptions necessarily are based upon knowledge of similar ore bodies tested elsewhere in Arizona.

Leaching of the *in situ* mineralization requires that the ore can be contacted efficiently by the leach solutions and that the mineral of interest will dissolve with the lixiviant used. (Lixiviant refers to the characteristics of the solubilizing fluids.) The ability to wet the ores is measured by permeability testing and an examination of the cores drilled through the ore body. In Arizona, only sulfuric acid is used when applied to the ore in dilute solutions. Laboratory tests have tried ammonium hydroxide, sulfur dioxide, and other exotic solutions. As a general statement, only sulfuric acids solutions have been found suitable to recover copper.

To understand how flow passes through the ore and how the material properties affect leaching and recovery, a simplified example of typical layering of an ore body is presented in Table 2 along with permeability characteristics generally found in these rock types.

Permeability varies widely by rock type but typically decreases by orders of magnitude with increasing depth and consolidation of the rock. Examples from the authors' experience are at Cyprus Tohono and BHP Billiton Florence. The overburden conglomerate unit will have permeabilities in the 9.7×10^{-4} to 4.8×10^{-1} centimeters per second (cm/sec) range. Oxide ores will have permeabilities in the 9.7×10^{-6} to 9.7×10^{-5} cm/sec range. The sulfide units will have significantly lower permeability. At the proposed Rosemont Copper Mine, the hydraulic conductivity values measured in short-duration pump tests in four pit characterization wells (PC-1 through PC-4) ranged from 3.6×10^{-7} to 1.6×10^{-3} cm/sec (Errol L. Montgomery & Associates, 2009, Table 3). The formations tested include basin-fill formation, Willow Canyon Formation, Glance Conglomerate, and the Epitaph Formation.

Table 1 Examples of in place and in situ leaching operations in Arizona

Mine	Location	Operation	Reference
Mercator Minerals (formerly Cyprus Minerals) Mineral Park Mine	Wickenburg, Maricopa Co, Arizona	In place leaching of pit walls and near pit (copper in chalcocite)	NRC, 1995, p. 68
BHP Billiton Miami Operations	Gila Co., Arizona	In place leaching of block-caved ore (copper in chalcocite)	U.S. Congress, 1988, Table 6-7, p. 125
BHP Billiton San Manuel Mine	Pinal Co., Arizona	In place leaching of block-caved oxide ore in an active underground mine; In situ leaching of the oxide zone ore (copper in chrysocolla in porphyry matrix) in the open pit during open pit operations and after open pit mining was completed	U.S. Congress, 1988, Table 6-7, p. 125 Wiley, Ramey, and Rex, 1994
Cyprus Tohono Mine	Tohono Reservation, Pinal Co., Arizona	In place leaching of block-caved ore (copper in chrysocolla in porphyry matrix)	U.S. Congress, 1988, p. 126
Cyprus Tohono Mine	Tohono Reservation, Pinal Co., Arizona	In place under-injection leaching of unbroken ores via drilling from mine adits (copper in chrysocolla in porphyry matrix)	U.S. Congress, 1988, p. 126
BHP Billiton Florence Project	Pinal Co., Arizona	Pilot testing of in situ leaching of a copper oxide ore deposit (copper in chrysocolla in porphyry matrix)	ADEQ, 1997 USEPA, 1997
ASARCO Inc.-U.S. Bureau of Mines Santa Cruz Joint Venture	near Casa Grande, Pinal Co., Arizona	Pilot test on <i>in situ</i> leaching of copper oxide (chrysocolla) and copper chloride ores (atacamite)	O'Neil, 1992 NRC, 1995, p. 67

Source: Compiled by SRK Consulting

Table 2 Typical rock types and generalized permeability

Rock Type/Mineralization Zone	General Permeability
Overburden conglomerate unit	High permeability
Oxide ore	Low to moderate permeability
Sulfide ore	Very low to extremely low permeability

Source: Compiled by SRK Consulting

The reason for the wide range of hydraulic conductivity values is the way the ore bodies were formed and subsequently altered, fractured, weathered, eroded, and redeposited as basin-fill conglomerate. As the intrusive magma pushed its way up from the magma chamber, copper and iron sulfides associated with hydrothermal fluids were deposited in veinlets and grain-size particles in the rock. Acid gasses associated with the magma subsequently attacked the original copper and iron sulfide minerals in the presence of oxygen and ultimately formed the oxidized chrysocolla. As the acidic copper-bearing solutions retreated downward de-oxidation occurred, and in the absence of oxygen, copper minerals (cuprite, chalcocite) formed at a deeper level, leaving residual iron oxides and hydroxides behind in the altered, fractured, and weathered oxide zone. Later, material eroded from nearby mountains covered the deposits with poorly cemented conglomerate. The net result is that water can readily pass through the conglomerate owing to its interconnected pore spaces and lack of consolidation, less so through the oxide ore, and generally not at all or very poorly through the sulfide ores due to its tightness.

Hydrothermal alteration, weathering, and intense post-deposit fracturing can naturally open the sulfide zone and produce a network of closely spaced fractures that allow even distribution and recovery of leach solutions; the rock behavior in this case performs as an "equivalent porous media" with good interconnection between the pores and fractures independent of specific fault zones. Leaching of competent rock that lacks such a comprehensive fracture network tends to direct the leach solutions continually along specific fractures or fault zones, which does not allow thorough penetration away from the specific fault or fracture zone. This fracture-flow distribution of leach solutions does not allow equal contact with the copper oxides and copper sulfides on fractures away from the predominant fracture system and consequently reduces copper recovery.

Attempts to open the ores by hydrofracturing techniques were tried in an effort to increase permeability and flow-through of injected fluids. Hydrofracturing, typically used in the petroleum industry, is a method whereby very high pressure is applied down a well bore to

create fractures that are kept open by injected sand or other materials (propants). In the late 1970s Project Sloop (Anonymous, 1967, p. 66-67) considered the use of a nuclear device at the deposit at Safford, but was stopped by the Salt 2 agreement with the Soviet Union. In essence, all attempts to increase permeability of sulfide ores have failed.

The solubility of the minerals themselves also is a major consideration. The sulfide minerals are greatly insoluble in the presence of sulfuric acid solutions. A minimal amount of chalcopyrite may be solubilized, but the mineral is disseminated in the ore along fractures typically sealed with quartz and the solution cannot readily access the copper mineralization. Molybdenum and silver are essentially non-soluble in the weak sulfuric acid solutions. The net result is the sulfide ores cannot be contacted efficiently by leach solution in low permeability rock materials, and even when contacted, the copper is minimally solubilized, and the silver and molybdenum are not recovered at all.

The Rosemont oxide ore, although not specifically tested for permeability, may have sufficient solubility within the ore matrix (in the presence of leaching solutions) to consider *in situ* leaching methods. This mineralized rock, however, is an acid-consuming ore and of very low grade at 0.18 percent total copper (WestLand Resources, 2007, p. 12) so may provide insufficient copper recovery values. If attempted, this *in situ* leaching would be on ore of substantially lower grade than other copper ores leached either “in place” or *in situ* in Arizona. “In place” or *in situ* ore grades at the Florence, Tohono, or Miami copper deposits are in the 0.3 percent or greater total copper concentration range.

Lastly, the regional hydrologic setting must be addressed for permitting reasons. The only permitted *in situ* greenfields facility is the Florence Project (ADEQ, 1997; USEPA, 1997) just northwest of the Town of Florence, Arizona. This permit was authorized on the basis of the favorable site-specific characteristics and the regional hydrology, and the permit required an aquifer exemption. Favorable site conditions at the Florence project included an extensive overlying and confining clay layer that did not allow solutions to migrate upward into the overlying conglomerate unit and area water resources. A demonstration was made through modeling and a pilot field test that injection and recovery wells would be able to maintain hydraulic control of the leach fluids and remediate the residual leach solution upon the end of leaching. The regional hydrology gradient in conjunction with the well field design provided control of the solution flow.

At Rosemont, the deposit has a relatively thin oxide zone (approximately 50-75 feet thick) with faulted blocks that have been downthrown to the east along steeply dipping faults (see Figure 1). The oxide and sulfide zones are buried by basin-fill formations that extend to a depth of approximately 1,500 feet below surface. The authors could find no mention of any

confining layer in the basin-fill formations to restrict the leached zone and protect the overlying aquifer. If Rosemont were to attempt leaching of the oxide ores by *in situ* leaching, the leach solutions may migrate vertically into the overlying conglomerate unit as the least tensor when the pressure is applied downhole is upward. Additionally, migration could occur laterally away from the basin-fill bounded fault blocks into the conglomerate. Furthermore, the rock matrix is acid consuming and may self-seal due to the formation of gypsum (calcium sulfate). It also appears from the description of regional geology (WLR Consulting, Inc., 2007, p. 19) that solution flow would be impacted by faults and cracks (redirecting the solution to barren rock, for example), thereby reducing the ability of leach solution to dissolve the copper silicates.

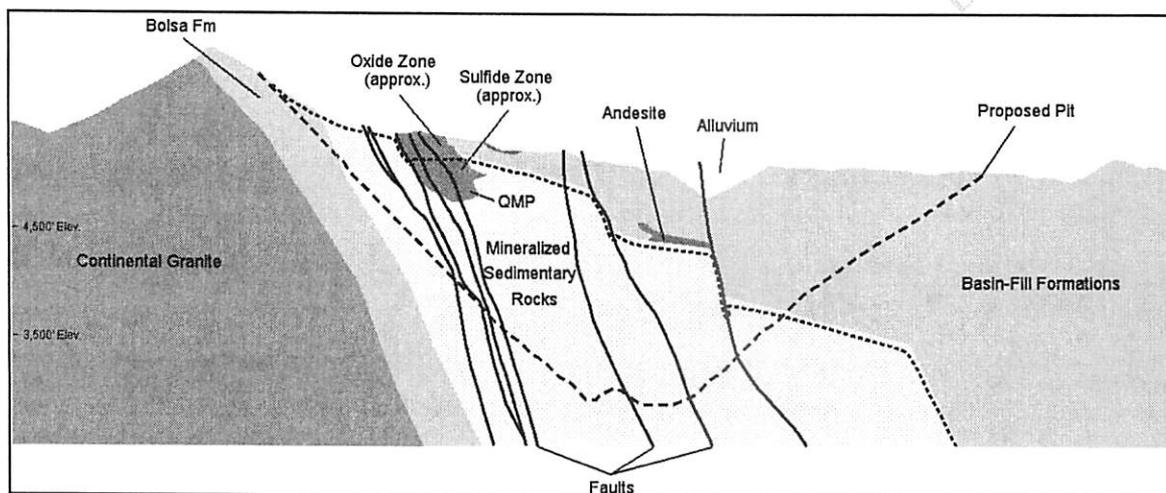


Figure 1 Schematic geologic section 553,425N showing proportion of oxide and sulfide mineralization in the Rosemont deposit

4.4 Consequences

- No significant excavations or milling/grinding of the ore to fine grain size would be required, thus there would be no tailings, or overburden piles.
- The physical plant footprint would be smaller than a crushing, milling, and concentrating operation.
- The copper oxide mineralization may be recoverable by *in situ* methods, but the oxide zone is only 10 percent of the identified copper resource based on the stated reserves and a portion of the oxide zone may be above the water table.
- It is highly unlikely that the Rosemont sulfide mineralization could be leached effectively using *in situ* leach methods owing to the low permeability of the sulfide zone and the inability of the leach solutions to contact the sulfide mineralization.

Recovery of copper would be extremely low due to the low solubility of the dominant copper sulfide minerals – chalcopyrite and bornite.

- Copper recovery, in what is expected to be a fracture-flow dominated system, will be low owing to the inability of the leach solutions to sweep effectively and thoroughly throughout the entire ore deposit.
- The molybdenum and silver mineralization in the sulfide ores could not be recovered by this extraction method.
- Permitting under the Safe Drinking Water Act would require a Class III well permit and an aquifer exemption permit but would likely be difficult owing to the specifics of the regional and local hydrology.

4.5 Summary

The *in situ* leaching works well in heavily fractured rock in which copper oxide and soluble copper sulfides are deposited along fractures, there is a very short distance (on the scale of inches) to the nearest fracture, the oxide zone represents a significant proportion of the deposit, and the leach solutions can evenly penetrate the mass of the rock to dissolve the contained copper. Environmental control is best maintained where there are no abrupt changes in the elevation of the ore deposit (across fault blocks for example) and there is an overlying confining unit to protect and separate the local and regional aquifers. These physical conditions are lacking at the Rosemont Copper deposit.

Use of the *in situ* leaching method at Rosemont would result in the loss of salable copper, silver, and molybdenum from the sulfide ores. Copper recovery from the oxide ore would be low, and it would be difficult to control inadvertent migration of leach solutions into the permeable basin-fill formations.

The *in situ* leach method has been considered as an alternative method, but in the authors' opinion it should be dismissed. This conclusion is based upon personal experience with *in situ* and "in place" copper leaching operations in Arizona and knowledge of prior work performed in both laboratory and field leaching tests of similar ore types.

4.6 Qualifications of Responsible Personnel

John Kline, B.S, MAOM, has a degree in chemistry and has worked for 35 years in the copper mining industry as a technical, environmental permitting, operations, and project manager. His specific work in the field of *in situ* leaching includes:

- Technical development of "in place" leaching at Cyprus Tohono;
- Conducted joint studies underground at the Tohono mine with U.S. Bureau of Mines personnel on fracture flow modeling and measurement in the porphyry deposit;

- Managed an underground injection test at the Tohono Mine; and
- Project Manager at BHP Copper Florence in situ leach project where he supervised the site scientific and technical investigations and pilot leach test, and obtained permitting for the site.
- Review of closure-related site characterization investigations at San Manuel Mine (geochemical field and laboratory test work, hydrogeological and geochemical modeling) performed by environmental consulting firm in support of an APP application for mine closure.

Corolla K Hoag, M.S., R.G., has a degree in economic geology and has worked for more than 20 years in the copper mining and environmental consulting industry. Her specific work in the field of in situ leaching includes:

- Geological site characterization and copper resource delineation at the BHP Copper Florence in situ leach project including detailed evaluation of the geology, mineral oxidation zones, fracture characterization, and the distribution of copper mineralization on fracture surfaces;
- Evaluation of scientific and technical results of the Florence in situ pilot leach test;
- Environmental support for Aquifer Protection Permit (APP) and Underground Injection Control permits at Florence in situ leach project.
- Geological characterization (mapping, drilling, and laboratory leaching tests) of the in situ and “in place” leaching zones at the BHP Copper San Manuel Operations for site closure investigations, geochemical, hydrogeological, and geotechnical modeling, and preparation of Arizona’s first APP application for the closure of a major copper mining and processing operation. On-going post-closure compliance monitoring of the San Manuel Operation including water quality trend analysis for impacted waters in a closed, in situ copper leaching operation.

5 Use High-temperature/High-pressure Leaching for Ore Processing

The following section on using high-temperature/high-pressure leaching for ore processing was prepared by John T. Kline, B.S., MAOM.

5.1 ACD Description

The proposed alternative is the use of high-temperature/high-pressure leaching for on-site processing of oxide and sulfide ores. The leaching would be followed by solubilization by a weak sulfuric acid solution and treatment of the copper-bearing solutions by SX/EW methods. The recovered copper would be in the form of copper cathode as the final site product. Cathode would be shipped to market by truck followed by truck or rail. This alternative would replace conventional smelting and electro-refining that is described in the MPO as the selected processing method for sulfide ore.

Infrastructure requirements for the open pit operation proposed by Rosemont (WestLand Resources, 2007, p. 30-33) are summarized in Section 1.1 of this report. Infrastructure requirements for a high-temperature/high-pressure leaching alternative would include:

- A facility for milling of the ore to the proper size suitable for high temperature/high pressure leaching;
- A facility designed to convert the minerals by temperature/pressure leaching;
- A facility for leaching the ores;
- A facility for separation of the leached copper from the leached tailings;
- A facility for tailings disposal;
- A SX/EW plant, administration buildings, maintenance shops, power lines, fencing, surface roads, and parking areas.

The facility to convert the minerals would be an enclosed vessel, with off-gas scrubbers to capture any potential releases of sulfur dioxide emissions. The vessel would be heated with natural gas to a temperature of 250–260°C. The ore would be in the vessel for several minutes, and oxygen or air would be added at pressures of greater than one atmosphere. The treated ore would be placed in an agitated leach vessel where acid solutions would be added. The leached ore then would be separated from the leach liquors in a series of thickeners, after which the pregnant leach liquor would be sent on to the SX/EW circuit.

The physical plant footprint for this alternative would be similar to the crushing/milling operation proposed in the MPO (WestLand Resources, 2007, p. 9).

5.2 Technical Feasibility

The oxide ores at Rosemont are already oxidized and any treatment by oxidation (high temperatures) and pressure is not necessary. The net result on the oxide ores is that leaching on heap leach pads using a weak sulfuric acid followed by SW/EW processing into copper cathode is all the processing that is needed. The sulfide ore, however, is materially different in mineralization. The mineralization at Rosemont is a mixture of chalcopyrite, chalcocite, and bornite, and the ore grade is relatively low (WestLand Resources, 2007, p. 12) at 0.47 percent total copper, 0.015 percent total molybdenum, and 0.12 ounces per ton silver.

The ore would have to be reduced to a size where the surfaces could be oxidized and the treated ores leached. Crushing and milling, as required to make concentrates as proposed in the MPO, would be required; however the physical size of the ore particles would have to be reduced to a dramatically smaller size than required for production of concentrate.

There is no record of bulk or milled copper *ore* being treated by high temperature/high pressure leaching. The scale of treating all ore in this manner is technically infeasible because the facilities to do so do not exist.

Although this evaluation found no technical equivalent to this alternative in current or past use in the copper industry for processing low-grade copper ores, low- and high-pressure leaching coupled with medium to high temperatures has been used in Arizona in a number of process types on copper *concentrates* (Moore, 1985; Marsden and others, 2007; Cole and Wilmot, 2009). Treating copper *concentrates* rather than copper *ore* would reduce the volume of the material to be treated by a factor of 20 to 40.

The current process used at operations in Arizona and world-wide reduces the sulfide ore in size and creates a copper concentrate prior to treatment by any of the pressure oxidation methods presently in use.

A roast leach process is one example of a high-temperature process used on copper concentrates. During the period 1988–1990, fluid bed roasting of copper concentrates followed by leaching was conducted on copper concentrates from the Cyprus Bagdad and Cyprus Sierrita mines. The processing was done at the Cyprus Tohono mine. The concentrates were treated by forming a slurry with water, which was injected into the fluid bed roasters. The process was initiated with natural gas until the exothermic reaction reached temperatures of 700–705°C. The sulfur dioxide off gasses were passed through a reactor and

converted into sulfuric acid. The roasted copper concentrate (calcine) was leached with raffinate from the SX/EW circuit, and the resultant copper-bearing solution was converted into copper cathode. This is one example where an attempt was made to process the concentrates on site and avoid shipping the concentrate to an off-site smelting facility. Although the process did recover copper, the overall copper recovery was lower than smelting and refining, and all contained precious metals were lost in the process. It did not recover any secondary metals either, such as molybdenum. No one uses the method currently in the copper industry.

Stoichiometrically, approximately 1.54 kilograms of weak sulfuric acid are produced per kilogram of copper produced by the SX/EW method. The production of weak sulfuric acid is ideal if the operation has run-of-mine oxide ore that is being leached on a heap or dump leach facility. The locally generated acid is consumed and used on-site and the need to transport acid to the site from a local smelter or other third-party acid producer is eliminated or reduced.

The net results of a roast leach process are lower recovery of copper than by smelting and loss of molybdenum and silver credits. Most waters in Arizona have some, typically low, level of chloride. The chloride will react with any solubilized silver, causing the silver to precipitate. The silver precipitate eventually reports to the tailings as silver chloride. The silver is not recovered in the process. The molybdenum is not recovered.

More recently Freeport-McMoRan has processed copper concentrates by medium-pressure/high-temperature leaching to recover copper from chalcopyrite, chalcocite, and covellite (Marsden and others, 2007; Cole and Wilmot, 2009). The concentrate is ground to a superfine grind (80 percent passing 7 microns) at an energy consumption of 68-kilowatt hours per ton. Copper recovery was 97.5 percent in the tests. The concentrates were treated at a temperature of 260°C.

The process is technically feasible on the right types of concentrate – that is, the copper-bearing minerals must be chalcocite or chalcopyrite, and the operator must find it more beneficial to use this method and lose the silver and molybdenum credits in the process. The operator must also have a heap leach facility to consume the excess acid that will be produced through the SX/EW process.

5.3 Practical Feasibility

The sulfide ore would have to be milled (ground) to a super-fine mesh size in order to expose the mineral surfaces to the leaching process. The ores would have to be heated in pressure vessels to a temperature exceeding 260°C. The process would require off-gas scrubbers, and

because the copper from the sulfide would be solubilized, a substantial load of weak acid will be generated through the SX/EW circuit during the mine life. This evaluation has not attempted to calculate the energy requirements to process ore by high pressure/high temperature leaching.

Since oxide ores will be leached by weak acid for only 6 years at Rosemont, this additional acid, which will be produced over the LOM, must be neutralized by some method over the LOM or sold to an off-site third party. Some form of neutralizing circuit would be required, and that would require a source of lime either from on site or off site. The significant imbalance between the amounts of sulfide concentrates on site to treat by pressure leaching versus the amount of run-of-mine oxide heap leach ore to consume the excess acid is the primary factor that makes this alternative impractical.

5.4 Consequences

- The proposed alternative would have no impact on processing the oxide ores because they are already in an oxidized state;
- There is no current process in use to recover copper, silver, and molybdenum from copper sulfide ores by this method. The process would have to be developed and evaluated.
- Feasible methods do exist using this alternative to recover copper from copper concentrates, but silver and molybdenum would not be recovered;
- The alternative would not result in less mining, handling, energy, and labor costs or personnel or facility requirements relative to the MPO;
- The footprint of the open pit and tailings facilities would not be reduced relative to the those proposed in the MPO unless the processing costs negatively affected the LOM reserves and plan;
- The footprint of the plant facilities would not be reduced;
- The process plant would be substantial in size, require sophisticated off-gas controls, and would result in no less tailings than generated by the conventional processes proposed by Rosemont;
- Fumes, sulfur dioxide off-gasses, and excess acid will be generated through the SX/EW circuit that will need to be mitigated, handled, and disposed;
- Additional permits would be needed to address the off-gasses and excess acid;
- The surplus weak acid generated through the SX/EW circuit would have to be addressed after Year 6 due to limited availability of Rosemont oxide leach ore;
- The process would require substantially more electrical energy than conventional milling and flotation;

- Off-site shipment of weak acid would occur via truck or rail transport if acid use on the heap leach pad was not sufficient to consume the excess acid.
- Off-site shipments of concentrate would be eliminated; and
- Off-site shipments of copper cathodes would be increased.

5.5 Summary

There is no current or proposed method found in the literature or current industry practice to process sulfide *ores* by low or high pressure or medium-temperature leaching. High-temperature pressure leaching of *concentrates* is used at number of copper mining operations world-wide as a replacement for conventional smelting and refining methods – especially in operations that have an optimal balance of sulfide and oxide ore to treat or other markets available to dispose of the excess acid that is produced. Rosemont currently does not have the optimal balance of oxide heap leach ore and sulfide concentrate pressure-leach ore to use all the excess acid that would be generated. The acid would need to be neutralized and disposed of on-site or sold to third parties who would commit to purchasing all of the excess acid.

Although not fully evaluated, the energy consumption to grind the ore and to provide the heat needed for conversion temperatures are expected to be too high use this method in a commercial application.

5.6 Qualifications of Responsible Personnel

The author of this section, John Kline, BS, MAOM, has a degree in chemistry and has worked for 35 years in the copper mining industry as technical manager, environmental permitting, operations managers, and project manager. His specific work in the field of copper concentrate processing includes:

- Operations Manager at the Cyprus Tohono Fluid Bed Roast Leach Acid Plant.
- Technical Service Manager with experience in process evaluation and various copper technologies.
- Chief Metallurgist at Hecla Mining Company, Lakeshore Mines, which process copper sulfide and oxide ores by leaching, concentrating, roasting/leaching, and SX/EW.
- Developed methods for the recovery of silver and copper from calcined leached tailings.

6 Modify the Mine Operating Life

The section on modifying the mine operating life was prepared by SRK technical staff under the supervision of Corolla K Hoag, R.G. The section was reviewed by John T. Kline, B.S., MAOM.

6.1 ACD Description

This alternative considers modifying the mine life [Life of Mine (LOM)] by lengthening or shortening the number of years taken to mine and process the same volume of ore¹ cited in the MPO (WestLand Resources, 2007, p. 9). The present LOM is 20 years with a mill through-put of approximately 75,000 tons per day. This alternative evaluation considers doubling the mine life to 40 years, and halving the mine life to 10 years. Both modifications would affect multiple aspects of mining and production: personnel, mining, processing, infrastructure, equipment, operations, on- and off-site vehicular traffic, and the timing of reclamation and closure.

Neither modification would affect the ultimate size of the open pit, waste rock dumps, or tailings piles unless changes in operating or capital costs affect the LOM reserves. Nor would either modification affect the total volume of water used or the ultimate viewshed. The technical and practical feasibility of modifying the LOM are discussed in Sections 6.2 and 6.3. Consequences of modifying the mine life are discussed in Section 6.4.

6.2 Technical Feasibility

Lengthening the LOM would entail operations over a longer period of time. It would require a smaller plant size, a reduced rate of production, reduced staffing, and reduced on- and off-site vehicular traffic on a daily basis. Shortening the LOM would involve a shorter operational time period. It would require a larger plant size, a greater rate of production, increased staffing, and greater vehicular traffic on a daily basis. The trade off is not 1:1. Doubling the mine life, for example, does not reduce plant size, infrastructure, or production rate by one-half. Halving the mine life does not increase the plant size, infrastructure, or

¹ The project will produce more than 230 million pounds of copper per year for 20 years. Average annual production of molybdenum and silver will be 5 million pounds and 3.5 million ounces, respectively.

production rate by a factor of two. The standard engineering rule of thumb for such changes in scale is a ratio of 1:1.6 that is increased or decreased from the base case.

LENGTHENING the LOM from 20 to 40 years would reduce operational conditions only by a factor of 1.6. In particular, conditions such as blasting and on- and off-site vehicular traffic, although minimized, would continue for 40 years. In actuality, emissions would go up with a longer mine life because trucks would haul smaller loads over a longer time period, which would require more truck trips. Further, mine operational related impacts would be spread out over a longer period.

Mines are impacted by environmental and safety factors including rain, wind, and the risk of safety incidents. A longer LOM increases the risk of rain damage, erosion, and wind damage and dust due to high winds. It also means that equipment gets older and more subject to failure. Regulatory impacts due to changing regulations can impact the compliance requirements as the mine life is extended. Markets conditions can change. There is also a reliance that concentrate shipments to markets are fixed, but as mine life is extended, the processing facilities, ports used to ship the concentrate, and off shore country political conditions can change.

SHORTENING the LOM from 20 to 10 years would require a considerable increase in the scale of the mining operation, the plant size and daily mill throughput, the number of personnel, mining and processing equipment, on- and off-highway vehicular traffic, and ancillary facilities. The mine footprint would be enlarged to accommodate these increases. Space required for the mining and milling operations would increase as well as the number of roads required for haulage, vehicular access, and deliveries on and off site. For example, a greater number of haul trucks entering and exiting the open pit would require more haul roads and different haul road routing to maintain safe and efficient traffic flow. Daily blasting would increase. The shortening of LOM time would increase noise, traffic, and air impacts on a daily basis.

Modifying the LOM for a facility comparable in size to Rosemont is technically feasible.

6.3 Practical Feasibility

Mine scheduling is largely dependent on the type and grade of material available from each of the deposits (Sullivan, 1989, p. 142). Sequencing of mining is generally achieved with specialized mining software and optimization techniques. Optimization programming (see for example, Zuckerburg and others, 2007) is used to derive the most practicable LOM given the mining bench height, ratio of overburden to ore; the size and capacity of the loading and hauling fleet, and the throughput capacity of the mill. The techniques take into consideration

the life of the mining and milling equipment, and it is not practical to expect such equipment would last 40 years if the mine life were lengthened. If the mine life were shortened to 10 years, the usefulness of the equipment and processing facilities would not be fully realized.

In addition, extending the LOM to decrease the tonnage rate produced on a daily basis would result in a decrease in haul truck sizes with less haulage capacity per truck. Smaller trucks, however, are less efficient with respect to emissions and dust due to the tire foot print. Optimizing the mine schedule is routinely done to take advantage of improvement when new equipment is purchased or equipment technology is improved. Doubling the LOM or halving the LOM with the resultant change in scheduling over the base case is not typically done in the industry.

6.4 Consequences

Numerous consequences would result from modifying the mine life by either shortening or lengthening it. As a single example, the consequences to of on- and off-side vehicular traffic are shown in Table 3.

Table 3 Example of modifying LOM – Consequences to on- and off-highway vehicular traffic

Trips	Proposed LOM ¹		Shortened LOM ²		Lengthened LOM ²	
	20 years		10 years		40 years	
	Approximate Number		Approximate Number		Approximate Number	
	Per Week	Per Day	Per Week	Per Day	Per Week	Per Day
Personnel round-trip travel to and from the plant (assumes 5-person van pools)	434	61	695	98	271	38
Shipments to and from the plant	582	88	931	140	351	55

¹ Source: WestLand Resources, 2007, Mine Plan of Operations, Table 6, p. 50.

² Source: Calculated by SRK Consulting, Inc., December 2009, from data in MPO Table 6.

Note: Numbers have been rounded and are approximate.

Additional consequences from lengthening or shortening the LOM are listed below.

LENGTHENING the LOM:

- Blasting would continue an additional 20 years;
- Daily blasting frequency would be reduced;

- On- and off-highway vehicle traffic would continue at a lower level for a longer period;
- Employment time would be extended an additional 20 years.
- Fewer employees would be required over the life of mine.
- Fewer shipments of sulfuric acid would be required on an annual basis;
- Shipment of sulfuric acid would continue for 40 years;
- Equipment aging may increase safety and environmental risk;
- Expected timeline to complete closure and reclamation activities would be extended;
- Regulations may change; and
- Country conditions where the concentrate processing is planned may change.

SHORTENING THE LOM:

- The mine footprint would be enlarged to accommodate increased activity;
- Blasting would be carried out only for 10 years;
- Daily blasting frequency would be increased;
- On- and off-highway vehicular traffic related to mining and processing activities would last only 10 years;
- On- and off-highway vehicle traffic related to mining and processing activities would be increased;
- More shipments of sulfuric acid would be required on an annual basis; and
- More employees would be required, increasing related vehicular traffic;
- The expected timeline to complete closure and reclamation activities would be shortened.

6.5 Summary

The life of the mine could be shortened or lengthened. Such changes would (1) reduce the length of time that mining activities are carried out but increase the activity, or (2) reduce the mining activity by spreading it out over a longer period of time. Modifying the LOM in the manner proposed in this ACD would not reduce impacts and may increase them. These types of alternatives are not a standard practice in the mining industry. Rather than using an arbitrary production schedule, mine-planning professionals use optimization programs to determine the most favorable life of mine using inputs from all of the conditions associated with the mine, such as infrastructure requirements and considerations of ore type, grade, and occurrence. For these and other reasons, this alternative is not technically or practically feasible.

6.6 Qualifications of Responsible Personnel

Comments included in this discussion are general in nature and are based on observations by the authors and reviewers at mine operations around Arizona and elsewhere in the industry. Reviewers include Corolla K Hoag, M.S., R.G. and John T. Kline, B.S., MAOM, each with more than 23 and 35 years in the mining industry, respectively.

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7 Suspend Mining during Certain Environmental Conditions

This section on suspending mining during certain environmental conditions was prepared by SRK technical staff under the supervision of Corolla K Hoag, R.G.

7.1 ACD Description

The proposed ACD would restrict mining operations to day only or night only. This alternative would lengthen the LOM and was discussed in Section 6 in the description of doubling the LOM.

The ACD also proposes to suspend mining during certain environmental conditions such as high winds, extreme drought, or excellent visibility. The intent of this alternative is apparently intended to reduce or eliminate fugitive dust created by mining and processing activities. Fugitive dust emissions may occur during mining and mineral processing operations.

7.2 Technical Feasibility

It is technically feasible to operate a mine on a 12-hour schedule (day only or night only) or to suspend mining operations during periods of extreme weather conditions.

7.3 Practical Feasibility

It is not practically feasible to operate a mine on a 12-hour schedule or to suspend mining operations for most environmental conditions. It is practically feasible to suspend some operations at the mine site for certain extreme environmental conditions, and this is done as a standard industry practice. Selected examples are provided below.

1. It is not practically feasible to operate a mine on a 12-hour schedule. Mining and milling operations are continuous-flow processes that are not amenable to being shut down half of each day (12-hour scheduling). For that reason it is an industry standard practice to operate an open pit mine and the associated processing facilities on a 24-hour-per-day schedule, 365 days per year. Operating on a 12-hour schedule would double the life of the mine. Such a change in scale would not lessen impacts and may increase them. (See Section 6—Modify the Mine Operating Life.)
2. It is not practically feasible to suspend mining during prolonged environmental conditions such as an extreme drought. The length of such a suspension would be unknown. Mine

staffing would be problematic, as would purchasing of equipment and supplies, meeting delivery schedules, mine and equipment maintenance, upkeep of infrastructure, and so on.

3. It is not practically feasible to suspend mining during high winds, in most instances. [Exceptions are described in Item 4, below.] A Class I or Class II air quality permit, required by the ADEQ, will establish air-quality standards for the facility. The permit class will depend upon the potential and magnitude of emissions from point sources, as determined by pre-application ambient particulate and meteorological monitoring and air-impact analyses. For normal operating conditions, dust at the mine site will be addressed by physical, engineering, and operational controls, as follows:

Roads

- Dust will be suppressed by wetting the road surfaces using a fleet of appropriately sized water trucks with up to 30,000-gallon tank capacities (WestLand Resources, 2007, p. 11).

Tailings (WestLand Resources, 2007, pp. 74-75)

- Waste-rock buttresses will break up air flow and reduce large areas of tailings to exposure to windy conditions.
- The moisture content of the tailings delivered to the dry stack area will be between 10 and 15 percent, sufficient to ensure that dust is not generated on the belts or in the stacking operation.
- Tailings will be stacked in an irregular pattern, breaking up air flow patterns.
- The use of dozers, trippers and mobile conveyors will reduce the use of wheeled vehicles.
- Lack of size segregation during tailings placement may reduce the likelihood for dust to become airborne.
- Binder material and agglomeration chemicals may be used to bind smaller particles so they do not become airborne.
- Water application may be used to suppress dust if it becomes necessary to control dust from limited areas of the tailings.

Mill Site

- Dust will be controlled in the crushing area with a wet scrubber dust collection system (WestLand Resources, 2007, p. 18).

- Dust in the coarse ore stockpile reclaim area will be controlled with a wet scrubber dust collection system similar to that in the crushing circuit (WestLand Resources, 2007, p. 18).
- Water sprays will be used for dust control at the primary crusher dump pocket (WestLand Resources, 2007, p. 75).
- Wet scrubbers will be used in the primary crushing building and crushed-ore stockpile building and tunnels (WestLand Resources, 2007, p. 75).
- The crushed-ore stockpile and concentrate loadout will be covered to control dust (WestLand Resources, 2007, p. 75).

4. It is practically feasible to suspend selected operations temporarily during high winds to comply with air-quality permit requirements. This is a standard industry practice.

5. It is practically feasible to suspend selected operations temporarily during extreme weather conditions to protect worker health and/or safety and the environment. These are standard industry practices. Specific directives typically are contained in mine Health and Safety Plans. For example, haul trucks do not drive into and out of the open pit during periods of torrential rain when the roads are wet and dangerous, and blasting is suspended during electrical thunderstorms. A run-of-mine stockpile, located near the primary crusher, will be used throughout the mine's life to provide flexibility in handling such short-term operating disruptions in the sulfide ore crushing and conveying system (WestLand Resources, 2007, p. 12).

5. It is practically feasible to limit blasting to daylight hours, typically between 9:00 am and 4:00 pm (WestLand Resources, 2007, p. 13).

7.4 Consequences

The principal consequence of limiting mining to 12 hours per day is to double the life of mine. Specific consequences are discussed in Section 6, under Shortening the Mine Life. The consequences of suspending mining during extreme environmental conditions are listed below:

- Unsafe operating conditions would be avoided.
- Dust emissions would be reduced.
- Air quality standards would be met.
- Processing could be disrupted.
- Scheduling could be adversely impacted.
- Employee schedules could be adversely impacted.

7.5 Summary

It is technically feasible to operate the mine on a day-only or night-only schedule. Operating on a 12-hour schedule would double the mine life and is discussed in Section 6.

It is technically feasible to halt mining and processing operations temporarily for extreme environmental conditions. It is not practically feasible in most instances to cease mining even temporarily. It is more practical to have in place physical, operational, or engineered controls that will prevent or mitigate adverse effects. However, it is standard industry practice to cease operations temporarily during environmental conditions that involve health and safety issues or damage to the environment.

7.6 Qualifications of Responsible Personnel

The author of this section, Corolla K Hoag, M.S., R.G., has worked in the mining and consulting industry for more than 23 years. The discussion is based on standard industry practices, the observations of SRK technical staff at domestic and foreign mining operations, and the author's work experience at multiple copper mining operations in Arizona.

8 Use of Sea Water for Mining and Ore Processing

The following section was prepared by John T. Kline, B.S., M.A.O.M.

8.1 ACD Description

Rosemont Copper plans on using approximately 3,800 gallons per minute (gpm) for industrial operations with a maximum of 5,000 gpm used during peak periods. The evaluation will address the technical and practical feasibility of supplying treated sea water for use in mining and processing operations at Rosemont Copper instead of the planned use of local groundwater.

8.2 Technical Feasibility

Sea water in its native state contains about 35,000 parts per million (ppm) of salt. In comparison, ground water contains generally less than 1,000 ppm of total dissolved salts (Anonymous, 2009). Water at the site would be used for dust control, processing, and for potable water. Sea water in its untreated form is corrosive to steel and is not potable. The salts would interfere in the process and could not be use in its native state for dust control on roads because of possible groundwater contamination. The review will assume sea water is taken from its sources and treated at the coastline prior to pumping to the site.

The use of sea water for industrial and drinking purposes is a well-known technology and has been used for many years. According to the U.S. Geological Survey (Anonymous, 2009), "In 2002, there were about 12,500 desalination plants around the world in 120 countries. Among industrialized countries, the United States is one of the most important users of desalinated waters (6.5%), especially (sic) in California and parts of Florida."

"In November 2009, Connecticut-based Poseidon Resources Corporation won a key regulatory approval to build a \$300 million water desalination plant at Carlsbad, north of San Diego California" (Energy Recovery, Inc., 2008). The plant is designed to produce 50 million gallons of drinking water per day (34,700 gpm) for southern California users. This plant alone will produce approximately 10 times the daily needs of Rosemont.

There are two main processes used to remove salt from sea water, namely, distillation and reverse osmosis (RO) (Ashley, 2009). RO is the more efficient process. This well-known and readily available technology uses filtration of sea water followed by passing the sea water past high-pressure membranes. The salt is separated as highly concentrated brine and returned to the sea. There are some environmental issues associated with this process as the brine may

have impacts on the local environment where the salt is discharged (California Coastal Commission, 2004).

Pumping long distances is also a well-known and commonly used technology. It is done in the oil and gas industry, and water is commonly pumped from its source to its end users through steel, concrete, and high-density polyethylene pipelines.

8.3 Practical Feasibility

The nearest source of sea water is the Gulf of California (Sea of Cortez) located southwest of Tucson, between the mainland of Mexico and Baja Mexico to the west. The approximate distance from the mine site to Puerto Penasco, which is the closest town on the Gulf, is 250 miles via roads. By dead reckoning, the distance is approximately 165 miles, but this path is across mountain ranges. The pathway crosses private fee lands, Indian Nation lands, and federal lands in the U.S. The pathway in Mexico traverses Mexican federal land and would cross an international boundary.

The second source option is a location near or surrounding San Diego, California. The approximate distance of the pipeline by dead reckoning is over 430 miles. The pipeline would cross state and federal lands and Indian Nation lands, and traverse two states.

In both case, the water line would have to be buried some of which would be along rights-of-way for existing roads. The pipeline would also cross through potentially sensitive areas such as archaeological sites, rivers and streams, mountains, town sites, and highways. The water would have to pass through purpose-built pumping stations due to elevation changes, expansion of the line, and line loss due to friction.

Numerous permits would be required and there may be a need to have an international agreement if the water source is from the Gulf of California.

As noted earlier in the Section 8.2, this would be a major undertaking, probably requiring its own EIS. In the opinion of this author, the technology is feasible, but the installation of such a pipeline to transport and maintain the water line is impracticable.

8.4 Consequences

- The water line would cross through potentially sensitive areas such as archaeological sites, rivers and streams, town sites, and highways;
- The water line would have to be buried;
- Numerous permits would be required;
- Brine disposal would be necessary at the treatment plant in Mexico or California;

- A determination would need to be made regarding legal ownership of the water rights; and
- International agreements may be required.

8.5 Summary

The production of water for mining and processing from seawater is possible because it is a commonly used technology. The large distances required to pump the treated water are substantial and the net result is that the alternative is impracticable due to the legal and environmental impacts that would be caused by the water treatment plant, the residual brine, and the transport pipeline.

8.6 Qualifications of Responsible Personnel

The author of this section John Kline B.S., MAOM, has a degree in chemistry and has worked for 35 years in the copper mining industry as technical manager, environmental permitting, operations managers, and Project manager. His specific work in the field of water management and treatment includes:

- Manager of Plant Operations, where he was responsible for operation and maintenance of a 14,000 gpm water production system;
- Manager of an Environmental Water Testing Laboratory;
- Technical Manager where he conducted test on mine solutions treatment by ion exchange and reverse osmosis; and
- Manger of an In Situ Copper Mining Leach Project in which a membrane filtration system was designed to treat mine water effluents.

9 Use Reclaimed Water for Mining and Ore Processing Operations

This alternative was prepared by SRK Consulting technical staff under the supervision of Corolla K Hoag.

9.1 ACD Description

Rosemont requires approximately 3,800 gpm (6,000 acre feet per year (af/yr) of fresh water for mining and processing operations (Stantec Consulting, 2009, p. 1). The company plans to acquire a water supply from the Santa Cruz basin to the west of the project site, from the aquifer within the Upper Santa Cruz sub-basin of the Tucson Active Management Area groundwater basin (WestLand Resources, 2007, p. 42). By purchasing and recharging water from the Central Arizona Project Rosemont has committed to offset total project pumping by 105 percent (WestLand Resources, 2007, p. 42).

The proposed alternative advocates using reclaimed water from Tucson, Green Valley, and other communities in Pima County rather than pumping groundwater for mining use. This would require construction of water lines from the water treatment plants directly to the proposed mine site or to a consolidated pump station and then to the mine, and assumes that excess capacity is available for purchase from the providers.

9.2 Technical Feasibility

The use of reclaimed water for mining and processing requires a review of several critical issues. These include:

- The volume of reclaimed water produced and the amount of excess capacity available for purchase, the transport method and route, and distances; and
- The suitability of reclaimed water for mining and processing use.

Of the 68,299 acre-feet of metropolitan area effluent produced by Pima County in 2007 (Gavin and others, 2009, p. 1), the City of Tucson had entitlement to 45.5 percent (31,055 acre feet) of this effluent and used 40 percent of its entitlement as reclaimed water for turf uses such as golf courses, municipal parks, other recreational facilities and schools, which accounted for 83 percent of the deliveries through the reclaimed system (Gavin and others, 2009, p. 6). Pima County's share accounted for 5.9 percent of total effluent, and 28,200 af were delegated to the U.S. Department of the Interior (DOI) for use by the Tohono O'Odham

Nation, as needed. Another 2,686 af and 2,348 af were allocated to Metro Water and Oro Valley, respectively.

As of April 2009, 77 percent of the effluent produced at the two large metropolitan treatment plants (52,500 af) is discharged to the Santa Cruz River where it accrues credits in permitted recharge projects, supplies downstream users, replenishes the aquifer, and sustains riparian habitat (Garvin and others, 2009, p. 2). The entire effluent allocations belonging to the DOI as well as the allocations belonging to Metropolitan Domestic Water Improvement District, and the Conservation Effluent Pool are discharged to the Santa Cruz River, along with portions of the Pima County and Tucson shares. The remainder (approximately 15,800 af) is used dominantly for irrigation of golf courses, parks, and schoolyards (Gavin and others, 2009, p. x). Similar programs are in place in Nogales and other communities in southern Arizona. The Nogales International Wastewater Treatment Plant provides river-based habitat for approximately ten downstream miles as well as replenishment of the aquifers serving Santa Cruz and Pima County communities. (IBWC, 2009). At least one municipality (Avra Valley) has applied for permits to resupply aquifers directly with reclaimed water through injection wells.

The use of reclaimed water at the proposed Rosemont Copper Mine would require transporting water from the wastewater treatment plants where the reclaimed water is generated. This would require either road transport by truck or the construction of pipelines—both methods are technically feasible. If sufficient water could be purchased from Tucson or some combination of municipalities, pipeline(s) could be constructed to deliver the reclaimed water to the mine.

Reclaimed water would be well suited for mining and processing operations—especially for the milling and concentrating facilities. Many mines in Arizona, such as the BHP Billiton Pinto Valley Mine and Freeport-McMoRan Bagdad Mine, do pump water from their on-site wastewater treatment plants for use in their mill and concentrator facilities. The gray water typically comprises a small volume of the water needed—the majority of reclaimed water comes from water pumped back from reclaim water ponds on conventional tailings facilities.

9.3 Practical Feasibility

Insufficient availability of reclaimed water on an assured, continual basis during Rosemont's LOM from one or more wastewater treatment plants is the primary limitation on the practical feasibility of this ACD. The reclaimed water currently is primarily used to recharge the aquifers that are being exploited for fresh water. Existing long-term contracts with private

parties secure the remaining reclaimed water for reuse within the communities that generated the water.

If sufficient water could be purchased, transporting this volume of water would require continual, round-the-clock operation of a large fleet of commercial water trucks (semi-trucks with approximately 9,000 gal container capacity or 500 trucks/day), which would not be practically feasible. The only practical method to transport the volume required would be to construct a pipeline from a pumping station in Tucson, which is the only potential source with sufficient capacity. The length of pipeline would approach 50 miles; the pipeline would cross private, state, and federal land, and would require extensive permitting to construct and operate.

9.4 Consequences

- The use of reclaimed water for mining and processing operations at the Rosemont mine is unlikely to cause any difficulties in those operations;
- Reclaimed water would be diverted from multiple other uses, such as for riparian habitat and aquifer recharge; and
- Pipelines would be required to transport water from the source(s) to the proposed mine (distances up to 50 miles).

9.5 Summary

While technically feasible, the use of reclaimed water at the Rosemont mine is not practically feasible owing to the lack of available reclaimed water. The majority of reclaimed water is used to supply downstream users, sustain riparian habitat, and recharge the groundwater aquifer. The water being recharged to the groundwater aquifer is being stored for future use by municipalities in southern Arizona.

9.6 Qualifications of Responsible Personnel

This section was prepared by technical staff of SRK Consulting, Inc., Tucson office, under the direct supervision of Corolla K Hoag, R.G. The information was compiled from publicly available data and is based on the observation of SRK technical staff at various domestic and foreign mining operations.

10 Use Microbial Leaching for Ore Processing

The following section on using microbial leaching for ore processing was prepared by John T. Kline, B.S., M.A.O.M.

10.1 ACD Description

Rosemont has proposed to mine oxide and sulfide ores in an open pit operation. Sulfide copper recovery would be via a milling/concentration circuit; oxide copper would be recovered via a heap leach and SX/EW operation. The Rosemont deposit was formed by a quart monzonite magma body intruding a relatively high-lime content host rock, namely the Horquilla Limestone, Colina Limestone, and Epitaph Formation (Tetra Tech, 2007, p. 8). The mineralization is characterized by finely disseminated and vein-controlled bornite, chalcopyrite, sphalerite, molybdenite, and pyrite; silver occurs in minor quantities associated with the molybdenite³ (Tetra Tech, 2007, p. 9). The pyrite content in the intrusive and sedimentary host rocks is low compared to other southwest porphyry deposits.

An alternative has been proposed to use microbial leaching for ore processing of all ore materials. The proposed alternative would eliminate the steps needed to mill and concentrate the sulfide ore. Copper and molybdenum concentrates would not be produced and the resulting tailings disposal facility would not be needed. Under this proposed alternative the following operational methods would be used:

- Oxide and sulfide ores would either be blasted or crushed to a suitable size, or placed on the lined heap leach pad as run-of-mine ore (i.e., not crushed).
- The heap leach materials would be inoculated with *Thiobacillus* species or other bacteria to facilitate the oxidation and leaching of sulfide minerals. Inoculation would not be necessary for the oxide copper ores.
- Leaching would be via application of acidic solutions most likely from the solvent extraction circuit after inoculation of the ores with the appropriate strain(s) of *Thiobacillus*.
- Piping, connected to low-pressure blowers, would be installed to pump air into the heap leach pad at the base of the heap to assist in oxidation and to maintain the required heat conditions within the heap.
- Copper would be recovered from the pregnant leach solution (PLS) via the solvent extraction-electrowinning (SX/EW) circuit and shipped to market as copper cathode.

- Lined inoculum, raffinate, and PLS ponds would be constructed to culture the bacteria and store the process solutions.

10.2 Technical Feasibility

The use of microbial leaching on Rosemont sulfide ores is dependent on the mineralogy of the ore and the potential leaching conditions. Heap leaching of sulfide ores is done widely around the world on low-grade sulfide ore containing chalcopyrite, chalcocite, and other sulfide copper minerals. Local, Arizona examples with varying levels of success include:

- BHP Billiton Pinto Valley mine near Miami,
- Freeport-McMoRan Bagdad mine near Bagdad,
- Freeport-McMoRan Morenci mine near Morenci,
- Freeport-McMoRan Sierrita mine near Green Valley, and
- ASARCO Ray mine near Hayden.

A substantial amount of laboratory and pilot test work has been done over the past decades to determine how to enhance the heap leach recovery of copper from primary sulfide minerals like chalcopyrite. Robertson and others (2005, p. 473) reported that 80 percent of the world copper resources, including resources in Chile, Peru, and Australia, consist of low-grade chalcopyrite mineralization for which the grade is too low to mill and concentrate and for which the mineralization cannot be processed in any other way than by heap leaching. Low copper recovery and long recovery times have been operational challenges for heap leaching of these sulfide minerals.

Thiobacillus aid in the leaching by electromotively converting the iron in solution from a reduced oxidation state (ferrous) to the oxidized form (ferric). The ferric sulfate then attacks the surface of the copper minerals and releases the copper into solution. The ferric iron is reduced back to ferrous state during the release of the copper into solution. The *Thiobacillus* then cycle the ferrous iron back to ferric and the process continues.

There are several environmental factors that allow the bacteria to assist in leaching the chalcopyrite sulfide ores. These are:

- The ore must have sufficient quantities of associated iron sulfide (pyrite) to release the iron as ferric iron, which then assists in dissolution of the copper minerals (Breed and others, 2000).
- The temperature of the ore, once the reaction starts, must remain in a suitable range to allow the bacterial to survive and grow. If the temperature gets too warm or cold the reaction will slow or cease entirely. Bioleaching of chalcopyrite generally

requires higher heap temperatures than required for leaching chalcocite, which can be achieved at ambient temperatures (Robertson and others, 2005, p. 474).

- The copper minerals must be contacted by the leach solution. If the mineral is encapsulated within the rock matrix or by a quartz vein, or is an area where flow bypasses the mineral surfaces, recovery of the copper will be lower or nonexistent.
- Chalcopyrite dissolves slowly, so leach times are on the order of months to years.
- Oxygen must be available to the mineral surface, and air flow is needed to maintain the core temperatures of the heap leach, so leach pad engineering is a key issue (Burkhalter and others, 2002, p. 5).
- Forced air has been used at several sites to ensure good availability of oxygen (Schlitt, 2006).

Once a leach system is employed, leach fluids become entrained in the heap and discharge by gravity to a solution collection pond or sump. Rainfall impacts the off-flow of the heap leach, so when the rainy season occurs, more outflow will generally occur for several weeks to months. Although the use of drip irrigation will reduce water use over the sprinkler method, a substantial amount of water still will be tied up in the leaching process. The end of the mine life will leave millions of gallons of draindown solutions that will need to be handled and remediated. This is true of all of the leach operations currently in use around the world.

In essence, microbial leaching of the Rosemont sulfide ore requires that the copper sulfides be exposed to the bacteria and be contacted by the leach solutions, that the heap be kept at the right oxygen and heat conditions, and that the bacteria are not killed by too much/too little water or acid. If all the operational conditions can be met, bacterial leaching of copper from chalcopyrite can be technically feasible.

10.3 Practical Feasibility

The author could find no metallurgical test work conducted on Rosemont materials to evaluate the practical feasibility of this option. Selected, limiting factors that impact the practicality of this proposed alternative include:

- The pyrite levels in the ore appear to be lower than those found in other southwest copper porphyry deposits. Pyrite is a contributor to successful microbial leaching.
- The matrix of the ore is in limestone, which would result in buffering of the ore to a higher-than-desired pH and likely would impede leaching. Precipitation of gypsum (calcium sulfate), resulting from sulfuric acid in contact with limestone (calcium carbonate) may cause the leach solutions to “blind off” and not contact all rock materials evenly or thoroughly.

- The minerals are finely disseminated in the ore matrix (Tetra Tech, 2007, p. 9), so exposure to the leach solution will be retarded unless the ore is crushed, which then exposes more lime to the acidic solutions.
- No molybdenum or silver would be recovered by the microbial leaching and processing of ores.
- The heap leach pad would be about 10 times the size of the oxide leach pad and would require engineered placement of the ore and surge ponds sufficiently large to hold major storm events.
- In order to expose the mineral surfaces, blasting may need to be enhanced to limit the ore size or the ore particles, or crushing may be required.
- Overall copper recovery will be lower than milling and concentrating.
- Leach times will take months to years to attain a modest level of recovery

Once a leach system is employed, significant volumes of leach fluids become entrained in the heap and must be drained and remediated at the end of mine life, which is extended owing to the slow recovery of the copper. Draindown of entrained solutions will also occur in the planned oxide heap leach facility, but the scale is substantially larger owing to the larger quantities of sulfide ore.

10.4 Consequences

The consequences of using microbial leaching to process sulfide ore in lieu of crushing, milling, flotation, and concentration of the sulfide ore include:

- Loss of silver and molybdenum metal recovery.
- The recovery of copper through the proposed ACD will be lower than that in crushing, milling, flotation, and concentration.
- Exposure of finely disseminate copper sulfides to the bacteria and to the leach solution will be retarded unless the ore is crushed, which then exposes more lime to the acidic solutions.
- The time to get the copper to market as product is increased due to the long leach times to dissolve the copper metal from the leach ore.
- The operation of the Rosemont life of mine will be extended due to slow leach kinetics and dealing with fluids generating as part of closure drain down and storm events.
- Solutions entrained in the heap leach pad and impacted by storm event will have to be managed and remediated for a substantial period (many years) after ore mining is no longer feasible.

10.5 Summary

Microbial leaching is done around the world as a normal course of business to extract copper from chalcocite and chalcopyrite sulfide material. Mines use the technique where the sulfide ore grade is too low to concentrate, and other methods of processing low-grade chalcopyrite are not economically feasible. Microbial leaching may be technically feasible, but is not likely to be practical in the case of Rosemont ores owing to the following conditions:

- The copper is located as finely disseminated minerals in an acid-consuming host rock matrix;
- Molybdenum and silver credits will be completely lost;
- Pyrite concentrations may be too low to fully assist the microbial leaching kinetics; and
- Lower copper recovery is expected than from the milling, flotation, and concentrating method.
- Tailings disposal would be eliminated.
- The footprint taken up by heap leach pads, SX/EW process plant, and process ponds will increase beyond what is proposed in the current MPO.

10.6 Qualifications of Responsible Personnel

The author of this section, John Kline BS, MAOM, has a degree in chemistry and has worked for 35 years in the copper mining industry as technical manager, environmental permitting manager, operations manager, and Project manager. His specific work in the field of copper concentrate processing and leaching includes:

- Technical Service Manager with experience in process evaluation and various copper technologies;
- Chief Metallurgist at Hecla Mining Company Lakeshore mines, which process copper sulfide and oxide ores by leaching, concentrating, roasting/leaching, SX/EW;
- Consulted on numerous leaching projects involving heap and dump leaching;
- Directed laboratory leach studies on heap and dump leach projects on ores from Arizona and elsewhere around the world' and
- Managed permitting activities on several ore leach projects.

11 Replace Internal Combustion Engines with Electric Motors

The following section on replacing internal combustion engines with electric motors was prepared by John T. Kline, B.S., MAOM.

11.1 ACD Description

The proposed alternative is to replace internal combustion engines with electric motors, presumably on mobile and fixed equipment and other mine equipment wherever feasible and practicable, in order to reduce local green house gas emissions (GHG).

Rosemont plans to drill blast holes with diesel or electric powered rotary rigs. Electrically powered shovels with 60 cubic foot dippers will perform the bulk of the ore and waste rock loading into the haul trucks. The loading would be augmented by use of two diesel-powered 33 cubic yard frontend loaders. The ore would be transported via haul truck to the crusher or waste pile as needed (WestLand Resources, 2007, p. 14). The type of haul truck to be used was not noted in the MPO (WestLand Resources, 2007). Rosemont was considering diesel-powered units with either mechanical or electrical drive.

The haul trucks would transport the ore from the open pit to a crusher located near the east pit rim. Crushed ore would then be transported by electrically powered overland conveyor to the crushed-ore storage pile. The ore then travels into the mill by electric operated conveyors (WestLand Resources, 2007, p. 13).

Oxide ore would be transported by the haul trucks to the leach pads and placed in 30-foot lifts. Crawler dozers would spread and rip the ore to promote infiltration of the leach solutions. All pumping from the various leach and environmental collection ponds would be by electrically operated pumps. The sulfide ore feeders, conveyor systems, and processing systems inside the SX/EW and mill circuits are electrically operated and controlled.

It is believed the intent of the proposed ACD is to limit GHG, including carbon dioxide, nitrogen oxides, and sulfur dioxides. The table below lists those pieces of operating equipment that could release green house gasses (GHG).

Rosemont was in the process of conducting pre-air quality application air monitoring to determine whether it needed an Arizona Class I or Class 2 air quality permit. This required a study of the local air shed to estimate the emissions inventory, in order to determine whether

the proposed operation would comply with all state and federal air quality requirements (WestLand Resources, 2007, pp. 72 and 73).

Table 4 Equipment that could release greenhouse gases

Equipment Type	Planned Equipment	Comments
Shovels	Electrically operated	Minimal to no GHG
Haul trucks	Diesel powered with either mechanical or electrical drives	Decision on unit not finalized as of the 2007 draft MPO. A trolley system was being investigated by Rosemont (WestLand Resources, 2007, p. 14)
Front end loaders	Diesel powered	
Crawler dozers	Diesel powered	
Front end loaders	Diesel powered	
Backup generators	Diesel powered	
Pickup trucks	Gasoline powered	For on-site transportation
Drill rigs-blast hole	Diesel or electrically powered	Decision on unit not finalized as of the 2007 draft MPO (WestLand Resources, 2007, p. 14)
Motor graders	Diesel powered	
Water trucks	Diesel or gasoline powered	Fuel depends on size of truck

Source: Compiled by SRK Consulting, Inc.

Non-road diesel emissions are regulated under federal law. Tier 1–3 standards are met by changes in engine designs that were phased in over the period 2000–2008 (DieselNet, 2009, p. 1). Rosemont will have to demonstrate compliance with state and federal air quality regulations to obtain an operating air quality permit.

11.2 Technical Feasibility

Rosemont has indicated in its 2000 draft MPO that it will consider several possible methods of reduction in emissions. These include:

- Diesel-powered haul trucks with either mechanical or electrical drives,
- Selected electrically powered blast hole drill rigs, and/or
- Haul trucks partially operated on an electric trolley system.

The technology for recent haul truck design includes electrically assisted drives. Liebherr, which began in the business in 1949, introduced the first 218-ton diesel-electric truck for the mining industry in 1982, and in 1998 Liebherr introduced what was at the time the world's largest ac drive diesel-electric truck (Yernberg, 2000). Caterpillar electric drive made its most

recent debut at MINExpo 2008, Sept. 22-24 in Las Vegas, Nevada (Curfman, 2008; Anonymous, 2008). The move from all-mechanical to electric-assisted drives is a well-known technology. These systems are used widely on a broad range of haul trucks.

Likewise, trolley systems are also technically feasible and have been used where conditions allow (Brown and others, 2001). These units are designed so that they can switch from diesel of electrical trolley, depending upon location and conditions.

Backup generators are used to supply power needed for critical systems where safety, operational, or environmental damage could occur in a power outage. These systems may be attached to the operational plants or located remotely at collection sumps. They, by need, operate in the absence of supplied power. They operate on diesel fuel. The units are included in the air quality permits and are accompanied by an estimated amount of annual operating hours, which are included in the air quality modeling. These generators are operated on an as-needed basis when there is a loss of supplied power. They are also operated during test cycles to assure they are available when needed.

Other mobile equipment that moves from location to location on a frequent basis includes:

- Motor graders
- Crawler dozers
- Water trucks

These units are used widely around the property on pit roads, plant road, access and utility corridors. This author found no examples where these types of unit are electrically powered

Rosemont proposes to install its crusher near the pit. There are examples where locating the crusher within the pit coupled with conveyors systems to feed the mill have been used (Dowall and Linde, 1993). Truck travel has been offset by near-pit or overland conveyor systems at locations in Arizona that include Cyprus Tohono, Freeport Sierrita, and Freeport Morenci. The goal was to limit truck travel and time to transport the ore.

11.3 Practical Feasibility

Several methods have been used locally in Arizona and internationally to reduce GHG emissions.

Substitution of electrical systems for diesel powered back up units is impractical as the diesel generators are stand-alone systems and operate only when the electrical grid or on-site electrical systems are inoperable. The impact on air quality is minimal due to the limited time

of operation. Generally, the air quality permit will include restrictions on hours of operation of these units.

Electrically assisted motor drives on haul trucks are commonly used in the industry. These units are designed to reduce carbon emission and meet Tier II EPA Guidelines (DieselNet, 2009). The in-pit shovels planned by Rosemont are stated to be electrically powered units. These units produce no significant on site green house gasses. Water trucks and wagons, and motor graders must be able to move over large geographic areas and it is not practical to have electrical tethers tied to them due to the distances.

Pickup trucks and maintenance vehicles could be replaced with battery-powered units such as golf carts; however, this is not practical due to the safety exposure of the drivers, who must conduct their work over large areas and in proximity to large mobile equipment.

Trolley systems and in-pit crushing systems are used practically in the mining industry; however, the use of the systems is site specific depending on elevation, distances traveled, safety considerations, and slope stability.

11.4 Consequences

Replacement of mechanically driven haul trucks, outside pit primary crusher with an in-pit crusher, and other mobile equipment will offset GHG emission on site. This offset is diminished by the additional installation of electrical power line, poles, and trolley systems that will require relocation when the pit enlarges. Likewise, an in-pit crushing system may reduce haul truck travel, but will require movement of the crushing facility periodically. Safety is also a considered factor due to installation of in-pit cables, overhead lines, and contact of trolley lines with nonhaul equipment by personnel and in-pit traffic.

11.5 Summary

Rosemont has indicated it will consider the use of electrical systems as part of its final determination of equipment mix and air quality studies as a method to offset GHG emissions. The final MPO should include a discussion of the results of these studies and the logic of the proposed choices. The net result is that the final choice will depend on mine design, safety considerations, and air quality impacts.

11.6 Qualifications of Responsible Personnel

The author of this section John Kline B.S. M.A.O.M., has a degree in Chemistry and has worked for 35 years in the copper mining industry as technical manager, environmental permitting manager, operations manager, and project manager. Specifically, he has been

responsible for mine and plant evaluations, mine and plant site power management, power reduction studies, air quality permitting, and operational management.

12 Reconstruct the McCleary Drainage Features at Closure

The following section on tailing relocation to reconstruct the original McCleary drainage at closure was prepared by Dave L. Bentel, Pr. Eng and Clara Balasko, P.E.

12.1 ACD Description

This section describes the alternative of removing tailings solids from the McCleary Drainage during Phase II of the project.

AMEC (2009, p. 16 and Drawing No. 600-CI-906) indicates that mine tailings will be placed in the McCleary Canyon drainage during Phase II of the Dry Stack Tailings Storage Facility (TSF). Phase II will commence in Year 12 and continue through the completion of the project in Year 20.

In the final configuration the Phase II Dry Stack TSF, the tailings will cover approximately 7,300 ft of the length of McCleary Canyon wash. The tailings will be stacked to an elevation of 5,237.5 feet above mean sea level (ft amsl) at the end of operations and will attain a maximum height of 587.5 ft at the midpoint of the TSF eastern boundary as shown on Figure 3. This height is the vertical difference between the ground elevation at the embankment toe and the final tailings surface elevation, as this defines the extent of tailings that requires removal.

As part of the site closure, this ACD proposes that the tailings placed in McCleary Canyon would be excavated and relocated to re-establish the natural drainage. The goal is to provide a low-maintenance alternative that minimizes potential downstream watershed impacts by providing the maximum surface water flow-through. Activities that would be involved in the implementation of this ACD are:

- Excavation and relocation of the tailings that overlie the McCleary Canyon drainage;
- Construction of flow protection within the channel and floodplain; and
- Reestablishment of McCleary Canyon drainage upstream of the plant site.

Two potential tailings removal scenarios have been evaluated.

Scenario 1 incorporates removal of the minimum amount of tailings necessary to allow “potential maximum through- flow function,” assuming that the through-flow generated in

upstream catchment areas is routed towards the northwest corner of the TSF (at the area of lowest TSF embankment height), and then into an approximately 150 feet wide channel section constructed by excavating at maximum 3:1 (H:V) side slopes, and removing the previously stored tailings along the approximate route shown on Figure 3 (black dotted and solid lines). [Note: The 150 feet wide base width is an estimate of the width required to route peak flows generated during the Probable Maximum Flood, and is based on designed profiles for the diversion channel (AMEC, 2009, Drawing No. 600-CI-940)]. Flows would be conveyed in the channel toward the midpoint of the remaining eastern embankment, and then down the eastern embankment slope via an engineered spillway with appropriate armor, erosion protection and energy dissipation features.

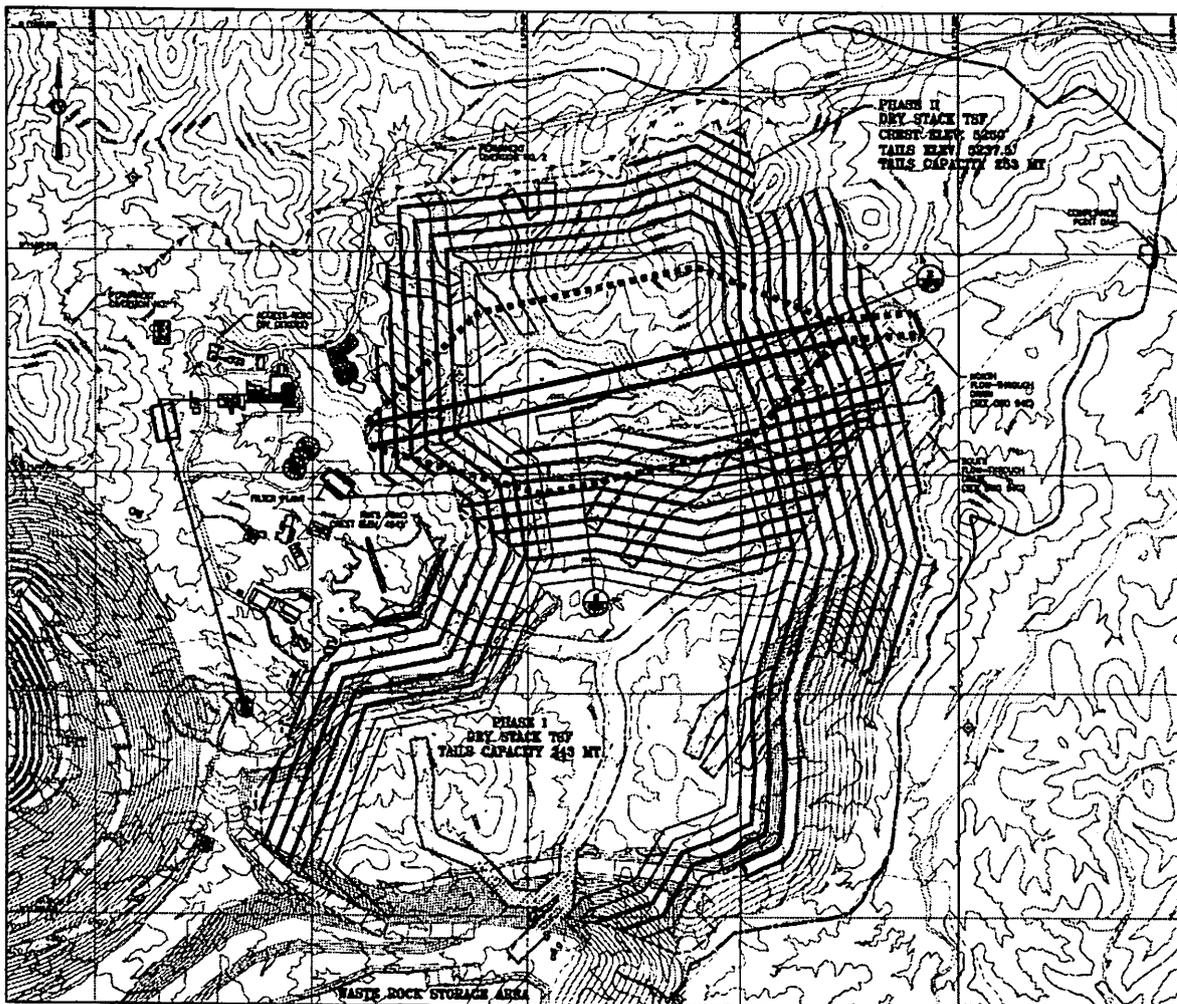


Figure 2 Tailings removal area in McCleary Canyon drainage and adjacent areas: Scenario 1

Under Scenario 1, the volume of tailings requiring removal is estimated at around 150 million tons. This estimate is based on formation of a channel profile that is 6,550 feet long with a starting base elevation of 4,900 ft amsl and an end base elevation of 4,834 ft amsl (i.e., 1 % slope from west to east), resulting in an average excavation depth of 370 feet along the length of the channel. The estimated volume of tailings requiring removal for this Scenario 1 is around 100 million cubic yards, or about 150 million tons (at 110 pound per cubic foot dry density). This represents about 60 percent of the dry stacked tailings stored on Phase II.

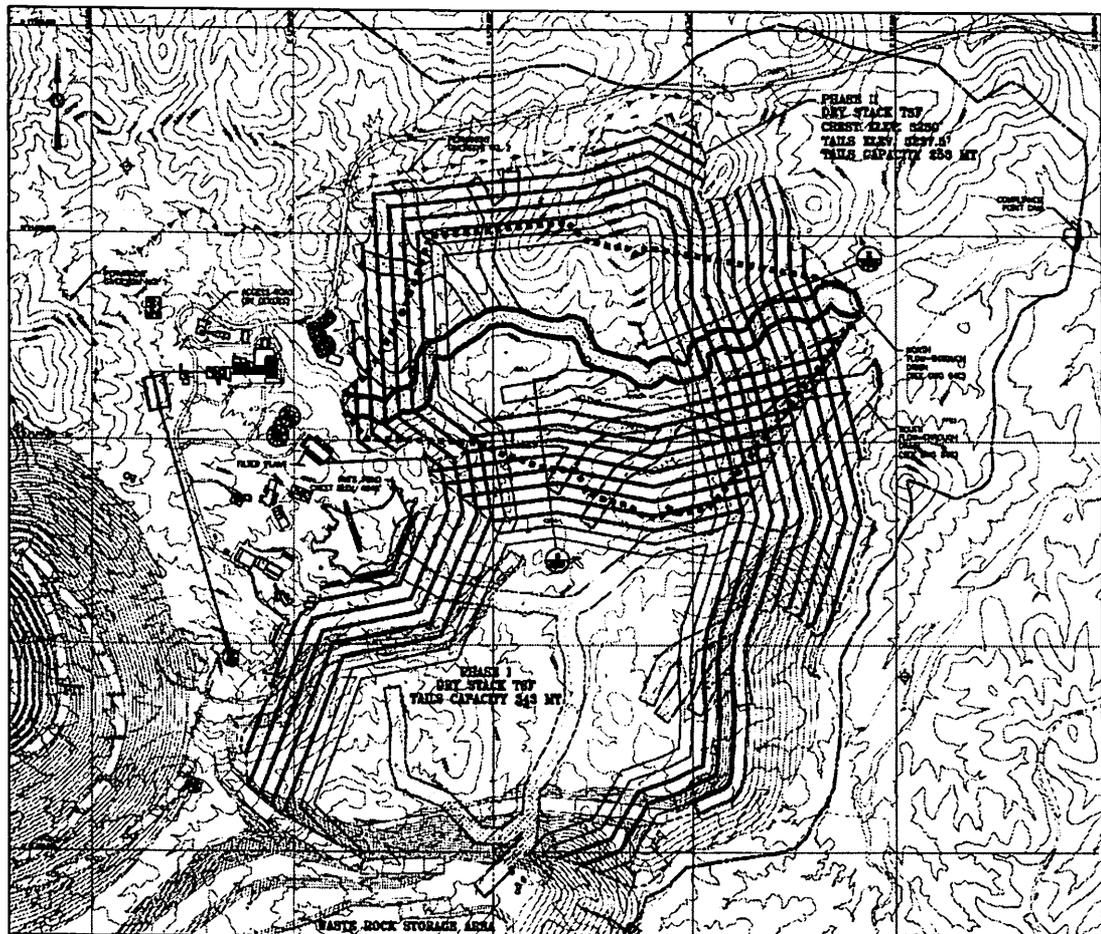


Figure 3 Tailings removal area in McCleary Canyon drainage and adjacent areas: Scenario 2

Scenario 2 assumes removal of tailings to the existing elevations of McCleary Creek bed, also to a minimum base width of 150 feet, 3:1 side slopes, and construction of adequate armor and erosion protection features (Figure 4, black dotted and solid lines). Similar calculations to those performed for Scenario 1 reveal that about 235 million tons of tailings would require

removal (or just over 90 percent of the dry stacked tailings stored on Phase II).

12.2 Technical Feasibility

The technical feasibility of tailings removal and slope/channel/spillway erosion protection are discussed below.

Tailings Removal

Methods successfully employed for removing previously stored copper tailings include:

1. Mechanical excavation (via scraper, backhoe), relocation (via truck) and lift placement within a pre-constructed containment facility; and
2. High-pressure water jetting using remotely controlled “monitor guns” that causes shear failure and reconstitution into a slurry form that is typically transported via agitation and pumping and placed in a pre-constructed storage facility.

The choice of which method to use is dependent to a high degree on the dry density of the tailings at the time removal is required. The dry density (in pounds per cubic foot or pcf) is the mass of the tailings solids (in pounds) divided by the total volume that the tailings occupy at any point in time (in cubic feet). The dry density is an indicator of tailings materials’ strength and resistance to shear forces, similar to those applied by mechanical excavation or high pressure water jetting.

For tailings with relatively high dry density, such as dry stacked tailings, mechanical excavation and removal is technically feasible, depending on the moisture content at the time of removal, and the propensity for the tailings to liquefy (and consequently lose strength) under anticipated field conditions at the time of removal.

For these tailings, reconstitution as a slurry via high pressure water jetting would also be technically feasible, depending on the thickness of cut being attempted. The relatively high dry density of the dry stacked tailings would require high breakout power and the cuts to be limited to a relatively low height because of monitor gun breakout power limitations.

When necessary, tailings can be moved to expand a mine operation where tailings or stockpiles impinge on the area to be developed, to remediate environmental degradation, to meet safety or other reclamation requirements, or to provide a beneficial post-mining land use. In addition, tailings are occasionally reprocessed owing to improvement in technology that allows recovery of the residual mineral resources at lower cut-off grades; this has been

done at several gold mines in South Africa where the value of the residual gold justified the cost to reprocess the historic tailings.

Selected tailings removal and erosion protection projects are summarized in Table 3. Included are the methods used to remove tailings and the approximate total tons of material removed.

Erosion Protection

The excavated slopes will require long-term protection against erosion. This will require installation of an adequate cover to the exposed tailings slopes such as a 2 to 3 feet thick layer of suitably graded, durable, geochemically neutral rock "rip-rap." The channel section and spillway for Scenario 1 will require similar protection with additional subbase preparation (e.g., additional compaction, low permeability liner). In addition the spillway section will require energy dissipation features as well as downstream sediment control facilities during construction and post-construction maintenance periods at a minimum. A representative example of previously implemented slope protection for regraded closed copper tailings slopes is the closed San Manuel TFS.

At this stage no representative examples of channels or spillways excavated into dry stacked tailings exist, however, the only other major technical risk identified with this construction is differential settlement of the channel/spillway bases, resulting in poor drainage and formation of potentially wet depressions along the channel/spillway routes. This is why low permeability liner may be required. In addition, planning for longer periods of post-construction maintenance will be necessary to ensure that ponding related to differential settlement can be addressed to assure that flows are not permanently detained along the channel/spillway routes.

If the tailings densities are maintained at around 110 pcf, differential settlement is not anticipated to be significant.

There are three on-site options for final location of the relocated McCleary Canyon tailings – all of which are technically feasible. If one or more of these alternatives are recommended for additional consideration, these would need to be reviewed in more depth to assess the practical feasibility and potential consequences of each one. These options include:

- Partial backfill of the open pit,
- Relocation to a new tailings facility, and
- Expansion of the current facility.

12.3 Practical Feasibility

The practical feasibility of implementing either Scenario 1 (mechanical removal) or Scenario 2 (reconstituting as slurry, and pumping) is dependent on the availability of an adequate storage repository for long-term containment and stabilization of the removed tailings. However, reconstituting the tailings as a slurry would require (at a minimum) about 200,000 acre feet of water for Scenario 1 and about 325,000 acre feet for Scenario 2, both based on an assumed solids:water ratio of 35:65. Due to the low availability of make-up water supply, a major objective of the dry stacking method of tailings deposition is to optimize water recycling and usage. Planned utilization of the water required for re-slurrying the tailing is not practically feasible because of the large additional water requirement that may not be available.

Further, it is not practically feasible to consider removal of the tailings due to the significantly high proportion of placed tailings that would potentially require double handling (i.e., 60 to 90 percent of placed tailings).

Assuming the tailings are excavated and relocated at the same rate they are placed (75,000 tons per day), it will take approximately 9 years to relocate the tailings. This would be in addition to the 3 years (Tetra Tech, 2007, p. 44) currently estimated for the demolition and closure of the mining facilities. From a practical point of view, as well as from the industry standard of "design for closure," it is in the operator's best interest to place the tailings during operation in their final location so as to reduce the time of closure and minimize the ultimate footprint of surface disturbance. A closer look at the final location options shows that only the "Partial backfill of the open pit" option requires that the mine operator wait until closure to place the tailings. If either of the other cases were chosen, standard industry practice dictates that the operator would choose to place tailings in the final location during operation.

12.4 Consequences

- If the majority of the tailings are removed the concurrent reclamation included in the MPO (WestLand, 2007, pg. 76-78) would not be required for the Phase II Dry Stack tailings design and operation.
- The closure timeframe would be extended by the time required to remove and relocate the tailing, and by the time required to close the final removed tailings repository, approximately 9 years. These extensions will require an appropriate increase in currently planned reclamation activities and water consumption requirements (e.g., for dust control).

- With the lack of concurrent reclamation of the side slopes and the 9 additional years of closure, there would be a major increase in water consumption for dust control.
- If the tailings were slurried for relocation purposes, there would be a large requirement of water, 200,000 to 325,000 af.
- The ACD would potentially increase the footprint of disturbance because the tailings would be placed in one location and then relocated to a second facility.
- Free-flow conditions within McCleary Canyon would allow native flora to reestablish itself and for wildlife to utilize the canyon; and
- Free-flow conditions within the canyon will increase flow velocities, which will make erosion protection to prevent undercutting of the tailings in the future more difficult.

12.5 Summary

- Relocation of the dry stacked tailings at a dry density of 110 pcf is technically feasible by conventional mechanical excavation/relocation/ placement methods and high-pressure water jetting/reconstitution as slurry/pumping methods.
- Long term stabilization of the excavated profiles is technically feasible using conventional engineered surface amendments such as rock armor (rip-rap) and energy dissipation features.
- Removal by either method is considered practically unfeasible because of:
 - The significant quantities of tailings requiring removal;
 - The significant volume of water required for jetting;
 - The lack of an approved disposal area for additional tailings waste disposal.
- In addition, current industry practice is to “design for closure” so that the mine waste materials (tailings, waste rock dumps) will not have to be double-handled at closure to achieve reclamation and safety requirements. Therefore, a tailings designer would not intentionally place tailings material in a temporary storage location if it were known in advance that the tailings would need to be relocated at closure.
- Scenario 1 geometry may be achievable by operational storage of about half of the Phase II tonnage in McCreary Creek Canyon and the rest in an additional impoundment (e.g., Schofield Canyon).

12.6 Qualifications of Responsible Personnel

Dave L. Bentel has a B.S. in civil engineering and is a registered engineer (South Africa) with more than 30 years’ experience in engineering and environmental permitting services, and financial estimating services for mining facilities. His areas of specialization include:

- Process fluid and stormwater management facilities,
- Tailings disposal facilities,

- Tailings recovery and re-treatment facilities,
- Heap leach facilities, and
- Open pit and waste rock disposal facilities.

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Table 5 Tailings relocation and erosion stabilization projects

Company/Name	Location	Tonnage (short tons)	Reason	Reference
BHP Billiton Miami No. 2 Tailings	Miami, Arizona	38 million tons	Part of closure reclamation program. Historic tailings were reprocessed to recover copper sulfides and oxides and re-deposited in an abandoned open pit. The former tailings area was covered and re-vegetated.	ADEQ, 2009, APP Draft Permit No. P-101356, p. 2
Monticello Mill Tailings Site	San Juan Co., Utah	2.54 million cy	Tailings were moved from 1992 to 1999 to remediate environmental degradation.	DOE, 2007. p. 11
Sherridon Orphan Mine	Manitoba, Canada	<8.21 million tons of material (in progress – will be completed in 2012)	In order to control acid generation from the sulfide tailings, a portion of them were relocated to ensure they would be submerged under a minimum of 1.5m of water.	Ramsey and Martin, 2009, p. 627
Climax Molybdenum Co. Climax Mine	Climax, Colorado	NA	Conversion of a tailings impoundment to a freshwater reservoir in the Eagle River Valley to develop post-mine beneficial water resources.	Romig, Cupp, and Ford, 1999
Belle Eldridge Mine (Historic)	Deadwood, South Dakota	3,300 cy	Remediation of breached, historic high-sulfur tailings that were contributing metals by wind and fluvial dispersal to streambed sediments. Tailings were removed from drainage and near mill foundation, 1999 to 2000, to a new impoundment.	Webb, Davis, Johnson, Porter, 2002

Source: Compiled by SRK Consulting

13 Summary

Alternate methods have been suggested for mining and processing ore, modifying the mine life, and disposal of tailings and waste rock at the proposed Rosemont Copper Mine. These methods were proposed with the intention of reducing the footprint of the proposed facilities, reducing the volume of mine wastes, and/or eliminating the disposal of mine wastes (waste rock dumps, tailings) on site.

Table 6 in Section 13.1 provides a summary of alternatives that in SRK's professional opinion and industry experience are not technically or practically feasible at this time at the Rosemont operation. These alternatives are not feasible alternatives to the base case methods presented in the Rosemont MPO.

Section 13.2 provides a summary of alternatives that in SRK's professional opinion and industry experience may be technically and practically feasible at the proposed Rosemont operation. Additional review of the associated capital and/or operating costs may be necessary to assess the ultimate feasibility of these alternatives owing to potential negative impacts on the LOM plan.

13.1 Technical and Practical Feasibility of Alternatives

Table 6 summarizes the technical and practical feasibility of the alternatives evaluated in this report.

Table 6 Technical and practical feasibility of alternatives

Alternatives	Feasibility	
	Technical	Practical
Moving tailings and waste rock to location on west side of Santa Rita Mountains	Yes	No
Use mechanical conveyance to move waste rock and tailings to the railhead	No	No
Use in-situ mining	No	No
Use high-temperature/high-pressure to leach ore	Yes ²	No
Shorten or lengthen the life of the mine	Yes	No
Suspend mining during certain environmental conditions	Yes	No
Use sea water to process ore	Yes	No
Use reclaimed water to process ore	Yes	No
Use microbial leaching	Yes	No
Replace diesel engines with electric motors	Yes	Yes ³
Reestablish drainage in McCleary Canyon at the close of mining	Yes	No

13.2 Alternatives for Final Consideration

Only one alternative was found to be both practically and technically feasible: replacing diesel engines with electric motors. This alternative, however, is practically feasible only for certain equipment.

² This alternative is technically feasible with reservations as it applies to concentrates not ore.

³ This alternative is practically feasible for selected equipment only.

14 References

- Anonymous, 1967, Kennecott proposes nuclear mining experiments at Safford deposit: Mining Engineering, vol. 19, no. 11, pp. 66-67.
- _____. 2008, Addressing unique challenges with drive train options for mining trucks: View Point, Issue 4, 48 p. Downloaded from www.cat.com/viewpoint, December 10, 2009.
- _____. 2009, Thirsty? Have about a cool, refreshing cup of seawater: U.S. Geological Survey (USGS) web site. Downloaded from <http://ga.usgs.gov/edu/drinkseawater.html>, November 25, 2009.
- Arizona Department of Environmental Quality (ADEQ), 1997, Aquifer Protection Permit No. 101704: issued to BHP Copper Inc. Florence Project on January 31, 1997, 123 p.
- _____. 2009, Aquifer Protection Permit No. 101546: Draft permit for the BHP Copper Inc. Miami Unit, 37 p.
- Arnold, Kathy, 2009, Updated summary table: *in* Response to request for additional analysis dated September 3, 2009, unpublished memorandum to Bev Everson, Doc No. 044/09-4.6.2, September 25, 2009, 109 p.
- Ashley, Steven, 2009, Drink up: Taking the salt out of seawater: Scientific American [online], March 19, 2009. Downloaded from www.scientificamerican.com, December 10, 2009.
- Breed, A.W., Dempers, C. J. N., Searby, G. E., Jaffer, M. A., and Hansford, G. S., 2000, The bioleaching of sulfide minerals: Developments in understanding the mechanism and kinetics of bioleaching pyrite, arsenopyrite and chalcopyrite: SME Annual Meeting February 28-March 1, Salt Lake City, Utah, Pre-Print 00-120, 13 p.
- Brown, G.M., Ebacher, B.J. and Koellner, W.G., 2001, Increased productivity with AC drives for mining excavators and haul trucks, 6th International Symposium on Mine Mechanization and Automation, South African Institute of Mining and Metallurgy, pp. 231-239.
- Burkhalter, C.J., Campbell, J.P., Andrade, H., and Gardner, T.C.A, 2002, Copper heap leach pad performance: Geotechnical lessons learned evaluation of several heaps after 3 plus years of service: SME Annual Meeting, February 25-27, Phoenix, Arizona, Preprint 02-161, 5 p.
- California Coastal Commission, 2004, Seawater desalination and the California Coastal Act: report prepared by the Coastal Commission staff, 97 p., 1 appendix. Downloaded from www.coastal.ca.gov/energy/14a-3-2004-desalination.pdf, December 9, 2009.

- Cole, J. and Wilmot, J., 2009, Morenci concentrate leach plant first year review: SME Annual Meeting, February 22– 25, Denver, CO, Preprint 09-028, 6 p.
- Curfman, Chris, 2008, President's Column: Caterpillar Global Mining—Viewpoint, issue 4, 45 p.
- DieselNet, 2009, Emission Standards United States: Nonroad diesel engines. Downloaded from www.dieselnets.com/standards/us/nonroad.php, December 10, 2009.
- Dowall, W.M. and Linde, T.B., 1993, Morenci's in-pit crushing and conveying system: Mining Engineering, March 1993, pp. 257–262.
- Energy Recovery, Inc., 2008, Seawater Desalination: Water, Water, Everywhere: Downloaded from <http://energy-recovery.blogspot.com/search/label/Desalination>, December 10, 2009.
- Errol L. Montgomery and Associates, Inc., 2009, Analysis of long-term, multi-well aquifer test, November 2008 through January 2009, Rosemont Project, Pima County, Arizona: prepared for Rosemont Copper, 41 p., 2 appendices.
- Gavin, Nicole Ewing; Dotson, Karen; Chavez, Kathy; and others, 2009, City of Tucson and Pima County Reclaimed Water Technical Paper, report prepared as part of the City/County Water and Wastewater Study, Phase II, 30 p.
- International Boundary and Water Commission (IBWC), 2009, Nogales International Wastewater Treatment Plant, Arizona: IBWC brochure, Downloaded from <http://www.ibwc.gov/Files/nogales.pdf>, December 15, 2009.
- Marsden, J.O., Wilmot, J.C., and Smith, R.J., 2007, Medium-temperature pressure leaching of copper concentrates—Part IV: Application at Morenci, Arizona: Minerals & Metallurgical Processing, vol. 24, no., 4, November 2007, pp. 226–236.
- Moore, D.C., 1985, Processing of concentrates and development trends, *with a section by Paul M. Musgrove, Jr., Lakeshore's roast-leach-electrowin circuit*: SME Minerals Processing Handbook, v. 2, January 1985, pp. 14H-1–14H14.
- National Research Council (NRC), 1995, Research programs of the U.S. Bureau of Mines – 1995 Assessment: Report prepared by the Committee on Research Programs of the U.S. Bureau of Mines, 138 p.
- O'Neil, Tim, 1992, In-situ copper mining at Santa Cruz: A project update: Mining Engineering, v. 4, no. 8, 4 p.
- Ortman, Dale, 2009, Alternatives Considered but Dismissed Evaluation, Scope of Work and Request for Cost Estimate: unpublished Project Memorandum to Claudia Stone, SRK Consulting, Inc., prepared for SWCA, 4 p., and appended documents.

- Ramsey, Doug and Martin, Jeff, 2009, Subaqueous disposal of sulphide tailings— Reclamation of the Sherridon orphaned mine site, Manitoba, Canada: *in* Sego, David, Moh'd Alostaz and Nicholas Beier (eds.), *Tailings and Mine Waste '09*, Proceedings of the Thirteenth International Conference on Tailings and Mine Waste, 1–4 November 2009, Banff, Alberta, Canada, pp. 627-638.
- Robertson, S. W., Vercuil, A., van Staden, P.J., and Craven, P., 2005, A bacterial heap leaching approach for the treatment of low grade primary copper sulphide ores: Proceedings of the Third Southern African Conference on Base Metals, January 2005, South African Institute of Mining and Metallurgy, pp. 471–484.
- Romig, B.R., Cupp, J.L., and Ford, R.C., 1999, Conversion of a tailing impoundment to a freshwater reservoir, the Eagle Park Reservoir Project, Climax Mine, Colorado: SME Annual Meeting, March 1-3, 1999, Denver, Colorado, Pre-print 99–108, 6 p.
- Stantec Consulting, 2009, Rosemont Copper water supply project: unpublished report prepared for Rosemont Copper, July 2009, 26 p.
- Schlitt, W.J., 2006, The history of forced aeration in copper sulfide leaching: SME Annual Meeting, March 27-29, 2006, St. Louis Missouri, Pre-print 06-019, 14 p.
- Sullivan, B.W., 1989, Open pit planning and selective mining practices at the New Celebration gold mine: *in* Bhappu, R.B. and Harden, R.J. (eds.), *Gold Forum on Technology and Practices--World Gold '89: Proceedings of the First Joint International Meeting Between SME and AusIMM*, November 5-8, 1989, p. 139–146.
- Tetra Tech, 2007, Baseline geochemical characterization, Rosemont Copper: unpublished report prepared for Rosemont Copper, Tetra Tech Project 320614, June 2007, 41 p., 2 appendices.
- Tetra Tech, 2009, Aquifer Protection Permit application, Rosemont Copper Company, vol. 1: unpublished application submitted to Arizona Department of Environmental Quality, February 2009, 246 p., 21 appendices.
- U.S. Congress, Office of Technology Assessment, 1988, Part 3 Resources and Technology, Chapter 6 – Copper Production Technology *in* *Copper: Technology and Competitiveness*: Washington, DC: U.S. Government Printing Office, September 1988, pp.103–147.
- U.S. Department of Energy, 2007, Third five-year review report for Monticello mill tailings (USDOE) site, City of Monticello, San Juan County, Utah: USDOE, Office of Legacy Management, DOE-LM/1472-2007, 29 p., 3 attachments.
- U.S. Environmental Protection Agency (USEPA), 1970, Clean Air Act; 42 United States Code §§7401 et seq., as amended in 1990: Download from www.epa.gov/air/caa.

- ____ 1997, Class III in-situ production of copper—Permit No. AZ39600001: issued to the BHP Copper Inc. Florence Project, June 1, 1997, 32 p.
- Webb, C. J., Davis, A. D., Johnson, C. S., and Porter, J. L., 2002, Reclamation and remediation of the abandoned Belle Eldridge mine near Deadwood, South Dakota: SME Preprint No. 02-078, 2002 SME Annual Meeting February 25–27, Phoenix, Arizona , 4 p.
- WestLand Resources, Inc., 2007, Mine plan of operations: unpublished report prepared for Augusta Resource Corporation, WestLand Project No. 1049.05 B 700, 106 p., 4 appendices.
- Wikipedia, 2008, Long belt conveyors: Downloaded from http://en.wikipedia.org/wiki/Conveyor_belt_Long_belt_conveyors, December 11, 2009.
- Wiley, K.L., Ramey, D.S., and Rex, M.J., 1994, In situ leaching wellfield design at San Manuel: Mining Engineering, v. 296, pp 991–994.
- Wisconsin Department of Natural Resources (WDNR), 2006, Flambeau mine: WDNR web site. Downloaded from dnr.wi.gov/org/aw/wm/mining/metallic/flambeau, December 11, 2009.
- WLR Consulting, Inc., 2007, 2007 mineral resource update for the Rosemont Project, Pima County, Arizona, USA: unpublished report prepared for Augusta Resource Corporation, April 26, 2007, 91 p.
- Xstrata copper, 2009, Antamina mine: Downloaded from www.extrata.com/operation/antamina, December 11, 2009, 1 p.
- Yernberg, W.R., 2000, Liebherr celebrates 50th anniversary – Introduces 300-ton mining truck: Mining Engineering, January 2000, 3 p.
- Zuckerberg, M., Stone, P. Pasyar, R., and Mader, E., 2007, Joint ore extraction and in-pit optimization: SME Annual Meeting, February 25–28, Denver, Colorado, Preprint No. 07-035, 3 p.

2.1 Use Sea Water for Mining and Ore Processing

The following section was prepared by John T. Kline, B.S., M.A.O.M.

2.1.1 Description

Sea water in its native state contains about 35,000 parts per million (ppm) of salt. In comparison, ground water contains generally less than 1,000 ppm of total dissolved salts.

Water at the mine site is needed for dust control, processing, and for potable-water uses (drinking, etc.). Untreated sea water is corrosive to steel and could not be used for processing. Further, the salts would interfere in the process. Untreated sea water could not be used for dust control on roads because of possible groundwater contamination. Finally, untreated sea water is not suitable for drinking and other potable uses. This review, therefore, assumes that sea water is taken from its sources and treated at the coastline prior to pumping to the site.

There are two main processes used to remove salt from sea water, namely, distillation and reverse osmosis (RO) (Ashley, 2009). RO is the more efficient process. This well-known and readily available technology uses filtration of sea water followed by passing the sea water past high-pressure membranes. The salt is separated as highly concentrated brine and typically it is returned to the sea.

The nearest source of sea water to Tucson is the Gulf of California (Sea of Cortez) located southwest of Tucson, between the mainland of Mexico and Baja Mexico to the west. The approximate distance from the mine site to Puerto Peñasco, Mexico, which is the closest town on the Gulf, is 250 miles via roads. By dead reckoning, the distance is approximately 165 miles. The second source option is a location near or surrounding San Diego, California. The approximate pipeline distance between Tucson and San Diego is over 430 miles by dead reckoning.

2.1.2 Advantages

The use of treated sea water for industrial and drinking purposes is a well-known technology and has been used for many years. According to the U.S. Geological Survey (2009), "In 2002, there were about 12,500 desalination plants around the world in 120 countries. Among industrialized countries, the United States is one of the most important users of desalinated waters (6.5%), especially (sic) in California and parts of Florida."

"In November 2009, Connecticut-based Poseidon Resources Corporation won a key regulatory approval to build a \$300 million water desalination plant at Carlsbad, north of San Diego California" (Energy Recovery, Inc., 2008). The plant is designed to produce 50 million gallons of drinking water per day (34,700 gpm) for southern California users. This plant alone will produce approximately 10 times the daily needs of Rosemont.

Pumping long distances is also a well-known and commonly used technology. It is done in the oil and gas industry, and water is commonly pumped from its source to its end users through steel, concrete, and high-density polyethylene pipelines.

2.1.3 Limitations

Environmental, right-of-way, access, permitting, and other similar issues are associated with treating sea water and transporting it from the source area to Tucson. Environmental issues include the impacts the brine may have on the local environment where the salt is discharged (California Coastal Commission, 2004), and impacts associated with construction of a pipeline and pumping stations along the pipeline corridor. The pipeline path in the U.S. is across mountain ranges, private fee lands, Indian Nation lands, federal lands, and an interstate boundary. The pathway in Mexico traverses Mexican federal land and private land, and would cross an international boundary.

Pipelines installed on the surface are subject to weathering due to movement and changes in temperature. They also provide a barrier to the movement of hunters, off road vehicles and other transportation, and migratory animals. The inherent movement of the lines causes wear and stress that can cause line failure. Theft of water and vandalism can also occur. Therefore, the water line would have to be buried along most or all of its route, some of which would be along rights-of-way for existing roads. The pipeline would also cross through potentially sensitive areas such as archaeological sites, rivers and streams, mountains, town sites, and highways.

Moving the water from the coast to the mine site would require construction of purpose-built pumping stations to overcome elevation changes, expansion of the line, and line loss due to friction.

Finally, numerous permits would be required to secure sea water, dispose of brine, construct a pipeline, and there may be a need to have an international agreement with Mexico if the water source is from the Gulf of California.

2.1.4 Summary

The production of water for mining and processing from seawater is possible because it is a commonly used technology. The water would require treatment, with attendant disposal of large quantities of salt brine. The long distances required to pump the treated water are substantial but not uncommon for pumping oil and natural gas. Limitations include the following issues:

- The water line would cross through potentially sensitive areas such as archaeological sites, rivers and streams, town sites, and highways;
 - The water line would have to be buried;
 - Numerous permits would be required;
 - Brine disposal would be necessary at the treatment plant in Mexico or California;
 - A determination would need to be made regarding legal ownership of the water rights; and
 - International agreements may be required.
-

Memorandum

Re: Draft Internal Communications Plan

This memo is to accompany the Draft Internal Communications Plan developed for the Rosemont Copper Project EIS.

The draft document has been written based on Forest Service guidance. However, there are several key sections that need to be addressed and several questions that need to be answered before the Internal Communications Plan can be finalized.

- Who is the Internal Communications Plan intended for? The Forest Service, SWCA, Rosemont Copper Company, Cooperating Agencies, or all?
- What actions should be included in the section called the “Action Plan”? Just communication (e.g., phone calls, emails, meetings, etc.) or should the entire project be broken down by task and by communication for each task (e.g., cooperating agency scoping letters mailed, biological field survey initiation, DEIS NOA published)?
- Who will be included in the “Contacts” section? Only the ID Team members, or key staff and personnel? Again, the need to define who the communications plan is for would be relevant in answering this question.
- Do we include a “Key Messages” and an “Evaluation” section for this plan?

May 2008

Forest Service Internal Communication Plan

**Rosemont Copper Project
Environmental Impact Statement**

SWCA Environmental Consultants

Telephone: (520) 325-9194

May 2008

May 2008

Forest Service Internal Communication Plan

Rosemont Copper Project Environmental Impact Statement

SIGNATURE PAGE

Director, Office of Communication

Date

Director, Client Staff

Date

Communication Contact, Office of Communication

Date

Prepared by SWCA Environmental Consultants, May 2008.

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EXECUTIVE SUMMARY

The purpose of the internal communication plan is to develop a protocol to facilitate communication between the Proponent (Rosemont Copper Company), the Coronado National Forest (CNF) and the Prime Consultant (SWCA Environmental Consultants) throughout the development of the environmental impact statement.

BACKGROUND

In July 2007, the Coronado National Forest accepted a Mine Plan of Operations, including a reclamation plan for proposed mining of copper, silver and molybdenum in the Santa Rita Mountains submitted by Rosemont Copper Company. The proposed mining project would be located on 995 acres of private land and 3,670 acres of National Forest System land, about 30 miles southeast of Tucson, Arizona, within Townships 18 and 19, Ranges 15 and 16, Gila and Salt River Meridian, Pima County, Arizona. Land under the jurisdiction of the U.S. Department of the Interior, Bureau of Land Management, and the State of Arizona may be affected by certain activities associated with the proposed project. Production of 234 million pounds of copper, 4.5 million pounds of molybdenum, and 2.7 million ounces of silver is estimated annually over a period of approximately 20 years.

Coordination

By statute (1872 Mining Law, 36 CFR 228), the Forest Service must make locatable minerals available to the mine proponent. In accordance with the President’s Council on Environmental Quality Regulations Implementing the Procedural Provisions of the National Environmental Policy Act of 1969, the U.S. Department of Agriculture, Forest Service, must prepare an environmental impact statement to document and publicly disclose the environmental effects of proposed construction and operation of an open-pit mine on National Forest System land and the effects of any necessary amendments to the Coronado National Forest Land and Resource Management Plan.

OPPORTUNITY STATEMENT

Opportunity Statement: The Coronado National Forest will supervise preparation of the environmental impact statement in compliance with applicable policy and legal requirements including, but not limited to, public review of the EIS, analysis of public

comments, and decision documentation. In exercising this responsibility, the Forest Coronado National Forest will endeavor to foster cooperation among other relevant agencies and to integrate NEPA requirements with other environmental review and consultation requirements in order to avoid, to the fullest extent possible, duplication of efforts by such agencies (40 CFR 1500.5(g)(h), 1501.2(d)(2), 1506.2) However, the Coronado National Forest will not delegate to any other agency its authority over the scope and content of the environmental impact statement or its approval of the Project.

GOALS

To develop a protocol to facilitate communication and coordinate the exchange of information between Rosemont Copper Company, the Coronado National Forest, and SWCA Environmental Consultants. All such communications will be part of the Coronado National Forest's deliberative process regarding the proposed project. This protocol will be determined considering the complexity of the proposed action, the Federal Advisory Committee Act, the Freedom of Information Act, and related agency guidance.

OBJECTIVES

- To establish networks and procedures that avoid duplication of tasks between the Coronado National Forest and SWCA Environmental Consultants
- To provide frequent opportunities for two-way dialogue with SWCA Environmental Consultants and the Coronado National Forest throughout the NEPA process

AUDIENCES

Coronado National Forest

- Coronado National Forest Supervisor's Office employees
- Nogales Ranger District employees
- Southwest Regional Office line/staff officers
- Washington Office directors (???)

SWCA Environmental Consultants

- Tucson Office employees
- Phoenix Office employees
- Flagstaff Office employees

Rosemont Copper Company

- Denver Office

Agencies

- U.S. Army Corps of Engineers

- U.S. Fish & Wildlife Service Region 2
- U.S. Bureau of Land Management
- U.S. Environmental Protection Agency
- Arizona Game and Fish Department
- Arizona Department of Transportation
- Arizona Department of Environmental Quality
- Arizona Department of Water Resources
- Arizona State Historic Preservation Office
- Arizona Department of Agriculture
- Arizona State Mine Inspector
- Pima County

Tribes

KEY MESSAGES

Applicable?

COMMUNICATION STRATEGY

The SWCA ID team will attend Forest ID team meetings regarding the development of the environmental impact statement and the NEPA process, as requested or deemed useful by the Forest Service.

Oral and written communications among ID team members are protected from disclosure to preserve the integrity of the deliberative process. Individuals who disclose this kind of information to the public and/or the Proponent will be excluded from further participation in the NEPA review.

TACTICS

Under no circumstances should any official activity identified in this plan be misused to influence Congress. Although the definition of lobbying differs within each statute or regulation, the restrictions generally prohibit contacting or encouraging others to contact federal legislators in an attempt to influence the enactment or modification of legislation or other specified activities. Should any questions arise as to the appropriateness of an activity, Legislative Affairs staff should be contacted prior to conducting the activity.

ACTION PLAN

Due Date/ Occurrence	Activity	Purpose	Who Responsible
Weekly 	SWCA project manager meet with FS ID Team	Provide status update on EIS and NEPA process	Tom Furgason, Bev
Weekly Thursday 2:00 p.m.	SWCA conference call	Provide status update on EIS and NEPA process	Tom Furgason
March 13, 2008	NOI published in Federal Register		
March 18, 19, 29, April 5, 22, 23	Arrange and facilitate Scoping Meetings?		
	Develop visuals (maps, photos, etc.) for public meetings		
April 29, 2008	Supplemental NOI published in Federal Register		
May 12, June 7, June 30, 2008	Arrange and participate in Public Hearings		
	Initiate consultation with cooperating agencies; offer field visits to site		
	Develop presentation for meetings with cooperating agencies.		
	Gather information for web page design		
	Develop executive summary of project for web page		
	Check web page progress (posting reclamation photos, etc.)		
	Develop press releases for local newspapers		
	Maintain contact with elected officials regarding process		

EVALUATION

Did you accomplish the objectives of plan? There are two ways to evaluate the plan's effectiveness:

Nominal evaluation

At best, this is a check on how well your actions are consistent with your objectives. Did you, for example, redesign the Web site that you said you would redesign? Did you host the press conferences that were mentioned in your strategic plan?

Examples of nominal evaluation:

This is a comprehensive communications audit, in which you collect basic evidence on media exposure among your publics. You quantify media placements: the number of media articles, radio and television spots, news conferences, Web site hits, etc. Be reminded that this evaluation method does not provide proof of effectiveness, which is best provided by effectiveness or outcomes evaluation.

Effectiveness or outcomes evaluation

This determines how far an observed outcome (a result) is a consequence of a communication program or campaign. You conduct surveys or experiments before the program is implemented and similar surveys or experiments after the program has been implemented. This means that you compare your baseline data (collected before program implementation) with outcomes data (collected after program implementation).

Examples of outcomes evaluation:

These examples measure one or more of the following variables: message retention, message comprehension, message awareness, message reception, behavior change, attitude change, and opinion change.

CONTACTS

Name	Title	Role	Phone Number	email
Coronado National Forest Supervisor's Office employees				
Reta Laford	Deputy Forest Supervisor	Management Oversight		
Teresa Ann Ciapusci	Staff Officer – Ecosystem Management	Project Manager/ NFMA compliance		

May 2008

Name	Title	Role	Phone Number	email
	and Planning			
Beverly Everson	Forest Geologist Minerals	EIS ID Team Leader		
Janet Jones	Administrative Support Specialist	Administrative Project Record		
Andrea Campbell	Forest NEPA Coordinator	NEPA compliance		
Nogales Ranger District				
Southwest Regional Office				
Washington Office Directors				
SWCA Environmental Consultants Tucson Office				
Tom Furgason		Deputy Project Manager	520-325-9194	
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Tom Euler		Cultural Resources Lead	520-325-9194	
Suzanne Griset		Tribal Consultation		
Rion Bowers				
SWCA Environmental Consultants Phoenix Office				
Ken Houser		??	602-274-3831	
Jeff Connell		Planning Project	602-274-3831	

May 2008

Name	Title	Role	Phone Number	email
		Manager		
Claire Bingaman		??		
SWCA Environmental Consultants Flagstaff Office				
Keith Pohs		NEPA Lead	928-774-5500	
Harmony Hall		??	928-774-5500	
Rosemont Copper Company				
Jamie Sturgess	Vice President	?		
?				
Cooperating Agencies???				

CONTINGENCY CONSIDERATIONS

The scoping process for the EIS has been extended to 120 days to end on July 14th. This will cause time delays for EIS deliverables throughout the process.

Regional and public review of Draft EIS has the potential to be extended to allow comprehensive review of the report. This could potentially delay deliverables.

The time line/schedule needs to be flexible to allow for delays.

From: [Melinda D Roth](#)
To: [Robert Cordts](#); [Beverley A Everson](#)
Subject: Fw: New files available for download from Brian Lindenlaub at WestLand Resources, Inc.
Date: 09/08/2010 03:53 PM

HOT OFF THE PRESSES! Looks like Army Corps has received the 404b1 analysis from Rosemont's contractor...

Mindee Roth
Coronado National Forest
300 W. Congress, FB42
Tucson, AZ 85701
(520) 388-8319
(520) 396-0715 (cell)
(520) 388-8305 (FAX)

----- Forwarded by Melinda D Roth/R3/USDAFS on 09/08/2010 03:49 PM -----

Brian Lindenlaub
<blindenlaub@westlandresources.com>

09/08/2010 03:12 PM

To Terry Chute <tjchute@msn.com>
cc 'Katherine Arnold' <karnold@rosemontcopper.com>, Reta Laford <rlaford@fs.fed.us>, 'Tom Furgason' <tfurgason@swca.com>, Melinda D Roth <mroth@fs.fed.us>
Subject FW: New files available for download from Brian Lindenlaub at WestLand Resources, Inc.

Terry,

Here's the email that Marjorie forwarded to Reta. The link should still work (though, of course, you may need to copy and paste it into your web address field). If it doesn't work, please let me know.

Regards,
Brian Lindenlaub | Principal
WestLand Resources, Inc.

-----Original Message-----

From: Blaine, Marjorie E SPL [<mailto:Marjorie.E.Blaine@usace.army.mil>]
Sent: Tuesday, September 07, 2010 4:28 PM
To: Reta Laford; Elizabeth Goldmann
Cc: Brian Lindenlaub; ANDERSON, ROBERT; gcheniae; Troxel, Tiffany A SPL
Subject: FW: New files available for download from Brian Lindenlaub at WestLand Resources, Inc.

Reta and Elizabeth

I am pleased to forward Rosemont's latest version of the draft Section 404(b)(1) alternatives analysis for the proposed Rosemont Copper Mine. Elizabeth and Reta

Please follow the link below which will allow you to download the zip file to your hard drive for review. Please note the link expires Sep 22 so I highly recommend you download immediately to your hard drive. I would appreciate receiving your comments no later than 0800 on Sep 21. I will be out of the office for two weeks starting on or about Sep 27 and would like to get all

comments to RM and the USFS before I leave. The priority in this particular review is simply to determine if there is enough information provided so the Corps may identify those alternatives (offsite and/or onsite) are available and practicable and thus should be carried forward to the USFS for evaluation in the EIS. After we identify which alternatives are available/practicable and can be carried forward, then we can spend more time digging into the document regarding the analysis of each alternative and determination of the LEDPA.

Thank you very much and I look forward to receiving your comments.

Marjorie

Assist us in better serving you!

You are invited to complete our customer survey, located at the following link: <http://per2.nwp.usace.army.mil/survey.html>

Note: If the link is not active, copy and paste it into your internet browser.

<https://westlandresources.filetransfers.net/batchSend.php?batchId=8242c056037e243a695208f57357330a&downloadReceiptId=d931acfdd7bca2ac5b8d7e2edeed4ba6>

Message from Brian Lindenlaub:

Revised Rosemont 404b1 Alternatives Analysis - September 6, 2010

This link will expire on 9/22/2010 at 5:12 PM MDT

If any link in this email doesn't work, please copy and paste it into your web browser's address or URL field.

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Transaction Source: WestLand Resources, Inc. FILETRANSFER SITE,
<https://westlandresources.filetransfers.net>
Time/Date of Transaction: 17:12 PM on 07-Sep-10

From: Tom Furgason
To: beverson@fs.fed.us; Melinda D Roth
Cc: Reta Laford
Subject: FW: Cooperating Agency-Led Alternative Process
Date: 12/07/2009 12:33 PM

Bev and Mindee,

We probably need to discuss this at the next meeting with Rosemont and determine what, if any, impact this will have on the schedule to deliver chapter 2.

Tom

-----Original Message-----

From: Blaine, Marjorie E SPL [mailto:Marjorie.E.Blaine@usace.army.mil]
Sent: Monday, December 07, 2009 12:27 PM
To: Tom Furgason
Cc: Teresa Ann Ciapusci; Brian Lindenlaub
Subject: RE: Cooperating Agency-Led Alternative Process

Tom

The Corps needs to stay actively involved in preparation of alternatives as it is imperative that our Section 404(b)(1) alternatives are the same as the NEPA alternatives. We are not able to take the lead on this as my workload does not allow me the time to do that. However, I want to be sure we do not have just an ancillary part in this. I'm hoping to be done with my special project within a couple weeks and then I will have more time to turn my attention to this. Brian Lindenlaub is going to be getting me the analysis on the three additional alternatives I asked them to review. I will not be available until after the first week in January...this month is out for me but I will be looking at WestLand's analysis and can provide some input (via email) as to what alternatives we believe should move forward. Basically, any alternative which is practicable in light of cost, logistics, and technology should be evaluated and that most definitely includes off-site alternatives.

I hope this helps and meets your deadline of today. Thanks, Tom.

Marjorie

In the interest of the environment, please print only if necessary and recycle

-----Original Message-----

From: Tom Furgason [mailto:tfurgason@swca.com]
Sent: Thursday, December 03, 2009 9:35 AM
To: Teresa Ann Ciapusci; brocious@base.sao.arizona.edu; cbeck@azdot.gov; Cindy Alvarez@blm.gov; daniel_moore@blm.gov; dtl@azdeq.gov; David_Jacobs@azag.gov; falco@cfa.harvard.edu; gfleming@asmi.az.gov; jmarques@ci.sahuarita.az.us; jmtannler@azwater.gov; julia.fonseca@pima.gov; jwindex@azgfd.gov; karen.howe@tonation-nsn.gov; lagrignano@azwater.gov; lee.allison@azgs.az.gov; Leslie.Ethen@tucsonaz.gov; LSwartzbaugh@asmi.az.gov; madan.singh@mines.az.gov; mark.harting@aztucs.ang.af.mil; Blaine, Marjorie E SPL; nicole.ewing-gavin@tucsonaz.gov; nicole.fyffe@pima.gov; ohenderson@ci.sahuarita.az.us; rcasavant@azstateparks.gov; stahle@ci.sahuarita.az.us
Cc: Jonathan Rigg; Melissa Reichard
Subject: RE: Cooperating Agency-Led Alternative Process

Attached are the directions for the ftp site.

Tom Furgason

Program Director
SWCA Environmental Consultants

343 West Franklin Street

Tucson, AZ 85701
(520) 325-9194 ext. 110

(520) 820-5178 mobile

(520) 325-2033 fax

From: [Beverley A Everson](#)
To: tfurgason@swca.com; mreichard@swca.com; [Melinda D Roth](#)
Subject: Fw: Alternatives
Date: 04/22/2010 05:33 PM

Please see Marjorie's message below. Brian asked that copies be returned to Westland (I'm be giving ours back tomorrow).

Beverley A. Everson
Forest Geologist
Coronado National Forest
300 W. Congress Street, 6th Floor
Tucson, AZ. 85701

Voice: 520-388-8428
Fax: 520-388-8305

----- Forwarded by Beverley A Everson/R3/USDAFS on 04/22/2010 05:31 PM -----

"Blaine, Marjorie E SPL"
<Marjorie.E.Blaine@usace.army.mil>

04/22/2010 12:42 PM

To "Teresa Ann Ciapusci"
<tciapusci@fs.fed.us>
cc "Brian Lindenlaub"
<blindenlaub@westlandresources.com>,
"Beverley A Everson"
<beverson@fs.fed.us>
Subject Alternatives

Teresa Ann

You all may have received an alternatives analysis for Rosemont through Kathy Arnold. This was prepared by WestLand. That is a premature document that was not supposed to go to the USFS. WL is currently preparing a technical memo with our final array of alternatives that they will send to me and I will forward to you.

My apologies. WL will be contacting you all to get the documents back. Thank you.

Marjorie Blaine
Senior Project Manager/Biologist
U.S. Army Corps of Engineers
Tucson Project Office, Regulatory Division
5205 E. Comanche Street

Tucson, AZ 85707
(520)584-1684 (phone)
(520)584-1690 (fax)

Assist us in better serving you!

You are invited to complete our customer survey, located at the following link:

<http://per2.nwp.usace.army.mil/survey.html>

Note: If the link is not active, copy and paste it into your internet browser.

From: [Tom Furgason](#)
To: [Blaine, Marjorie E SPL](#); [Teresa Ann Ciapusci](#)
Cc: [Brian Lindenlaub](#); Goldmann.Elizabeth@epamail.epa.gov; [Reta Laford](#); [Beverley A Everson](#); [Melinda D Roth](#); [Melissa Reichard](#)
Subject: RE: Alternatives considered but eliminated
Date: 01/28/2010 12:01 PM

Marjorie,

Thank you for taking time to review the Alternatives Considered but Dismissed document. The document was prepared for the Coronado's ID Team to confirm part of their alternatives development process. The ID Team did not focus on developing alternatives that avoided or minimized impacts to WUS. They did consider impacts to riparian vegetation. The Coronado will have to rely on the 404 (b) (1) document to satisfy the Corps requirements for demonstrating alternative development for avoidance/minimization of impacts to WUS.

Tom Furgason

Office Director
[SWCA Environmental Consultants](#)
343 West Franklin Street
Tucson, AZ 85701
(520) 325-9194 ext. 110
(520) 820-5178 mobile
(520) 325-2033 fax

From: Blaine, Marjorie E SPL [mailto:Marjorie.E.Blaine@usace.army.mil]
Sent: Wednesday, January 27, 2010 4:55 PM
To: Tom Furgason; Teresa Ann Ciapusci
Cc: Brian Lindenlaub; Goldmann.Elizabeth@epamail.epa.gov
Subject: Alternatives considered but eliminated

Tom

I've received and reviewed the document. Actually, there were only two alternatives in this document which might possibly be Sec 404 alternatives (i.e. would reduce impacts to WUS). One would be waste rock dump and tailings on the west side of the Santa Ritas which I believe is not practicable due to the haulage costs, the increase in pollutants from trucks, the visual impact, etc...in other words, it has cost and logistics problems and it increases other environmental impacts without the great possibility of avoiding WUS. The other was *in situ* mining. Other than those two, this document does not really provide us with a lot of information for avoidance/minimization of impacts to WUS.

Thanks, Tom.

Marjorie Blaine

Senior Project Manager/Biologist
U.S. Army Corps of Engineers
Tucson Project Office, Regulatory Division
5205 E. Comanche Street

Tucson, AZ 85707
(520)584-1684 (phone)
(520)584-1690 (fax)

In the interest of the environment, please print only if necessary and recycle

From: [Beverley A Everson](#)
To: [Salek Shafiqullah](#)
Subject: Fw: Modeling information....
Date: 01/18/2010 01:33 PM
Attachments: [RCC Davidson Canyon Proposal Redacted Version.pdf](#)

FYI

Beverley A. Everson
Forest Geologist
Coronado National Forest
300 W. Congress Street, 6th Floor
Tucson, AZ. 85701

Voice: 520-388-8428
Fax: 520-388-8305

----- Forwarded by Beverley A Everson/R3/USDAFS on 01/18/2010 01:32 PM -----

Kathy Arnold
<karnold@rosemontcopper.com>

01/18/2010 08:42 AM

To: Beverley Everson <beverson@fs.fed.us>, Tom Furgason <tfurgason@swca.com>
cc: Jamie Sturgess <jsturgess@augustaresource.com>
Subject: Modeling information....

Bev and Tom -

As Jamie discussed in a meeting a couple of weeks ago, we have asked Tetra Tech to complete an analysis of the Davidson Canyon flows including springs and seeps. The attached proposal describes the process we are going through. I have (as discussed) redacted the cost information – including the detailed budget.

Regards,
Kathy

Katherine Ann Arnold, P.E. | Director of Environmental and Regulatory Affairs
Cell: 520.784.1972 | Main: 520.297.7723 | Fax 520.297.7724
karnold@rosemontcopper.com



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RCC Davidson Canyon Proposal_Redacted Version.pdf