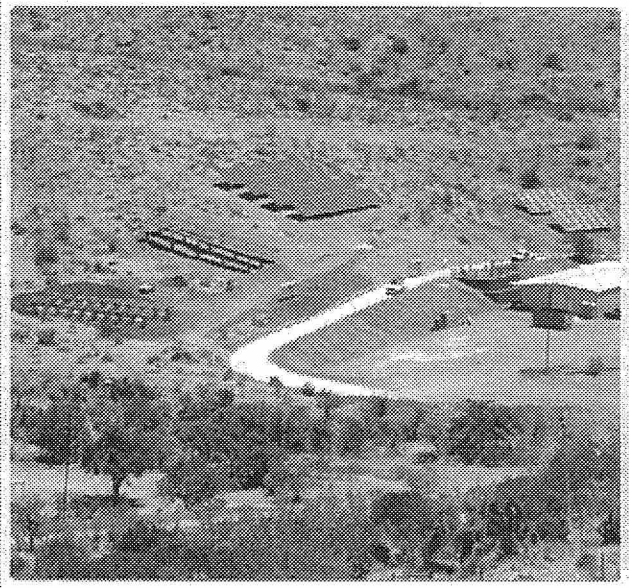
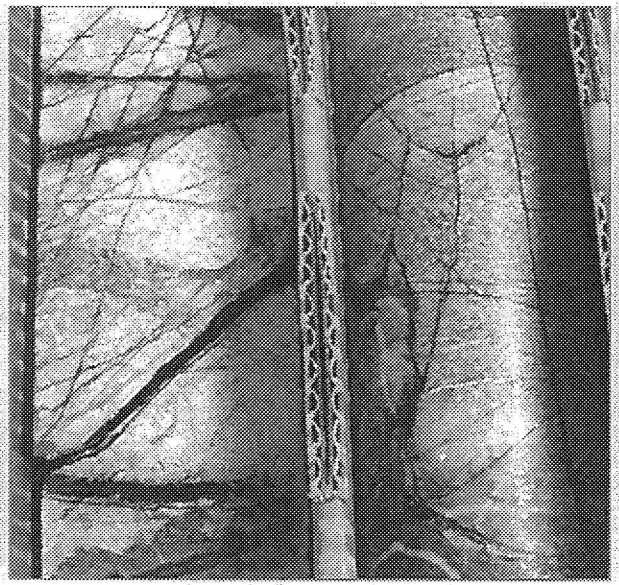
HUDBAY

Rosemont Project





HBM TMX NYSE

August 2018

Discussion

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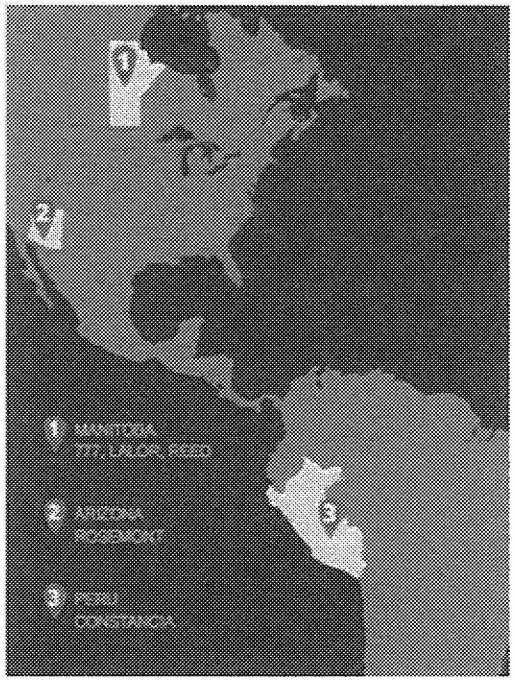
- Project Background
- History of Permitting Process
- Extensive Monitoring and Mitigation
- Current Status

About Hudbay

HUDBAY

INTEGRATED BASE AND PRECIOUS METALS MINING COMPANY

- Operating mines, development projects and processing facilities located in the Americas
- Long track record of operating success in Flin Flon Greenstone Belt
  - Nearly 90 year history of mine development and operation (28 mines)
- Recently completed Constancia mine, similar in size and scope to Rosemont

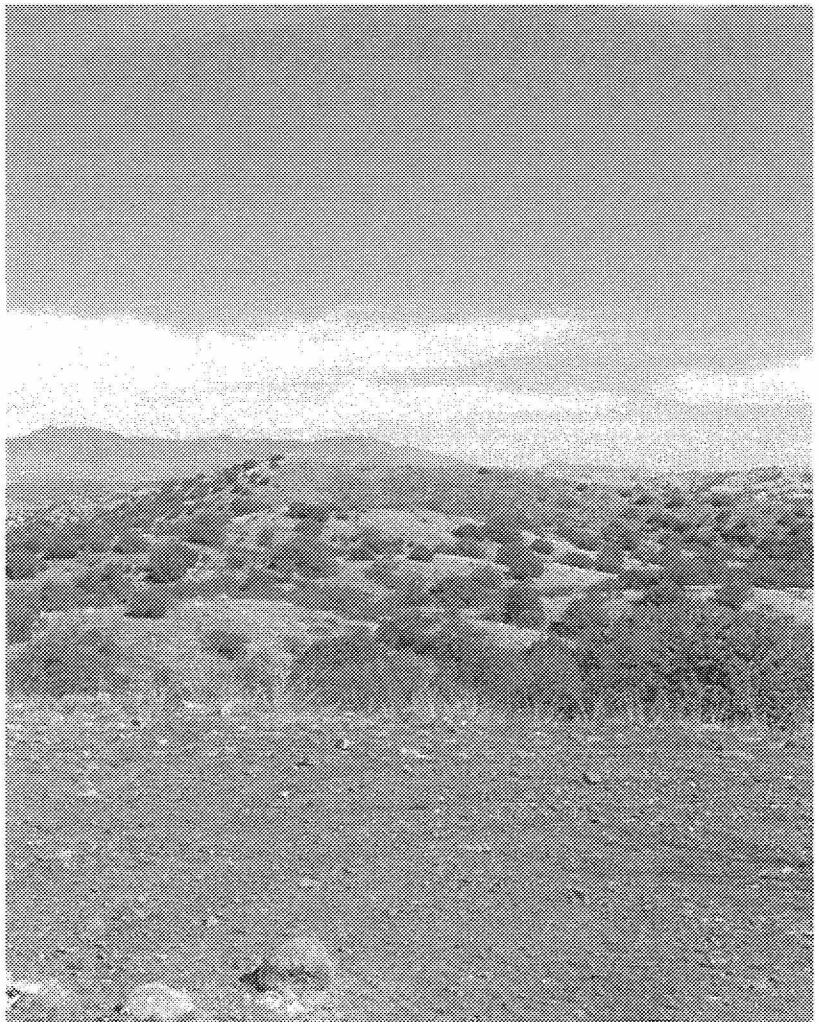


Rosemont Project

HUDBAY

80%-OWNED COPPER PROJECT

- High-quality development project with well-established infrastructure
- Permitting and community engagement progressing
- Estimated $20 million spent in 2017 to advance project
- To date, Rosemont has spent over $100 million in permitting and advancing the Project



Rosemont Project Site

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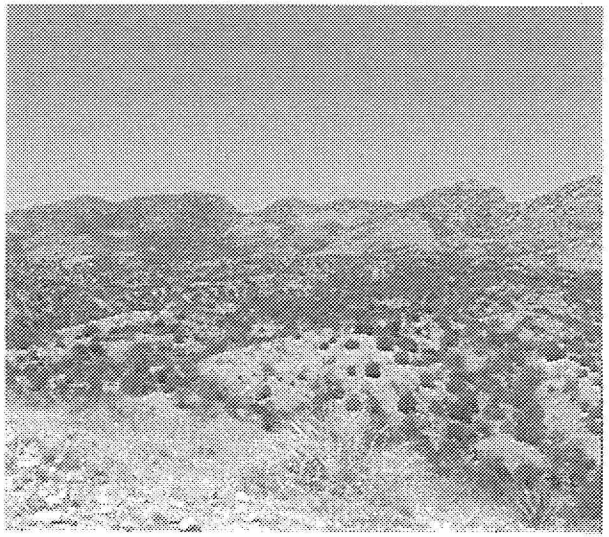
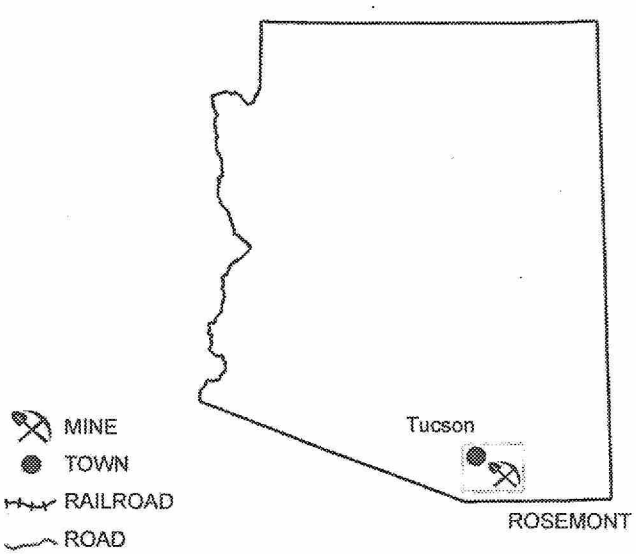
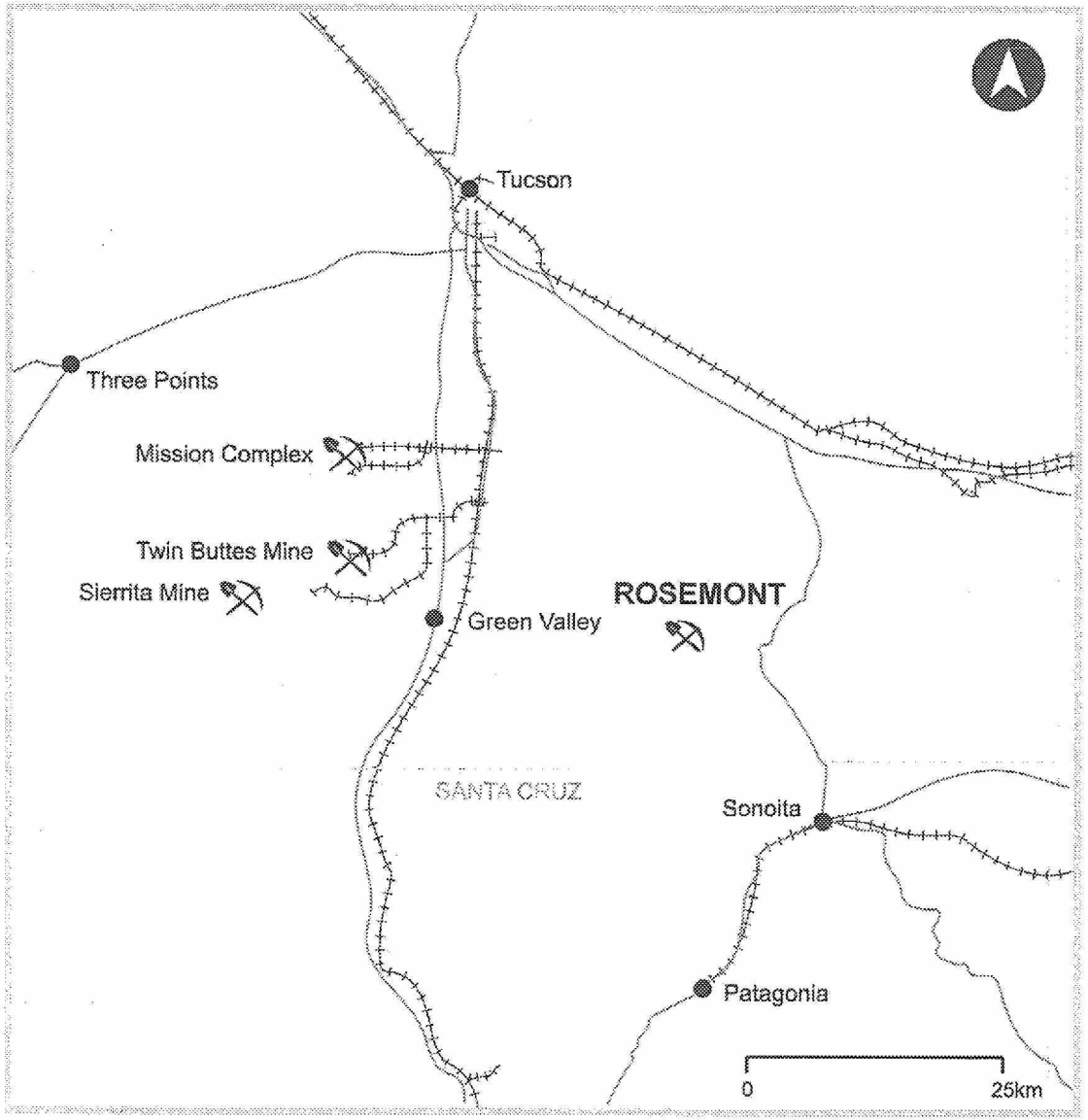


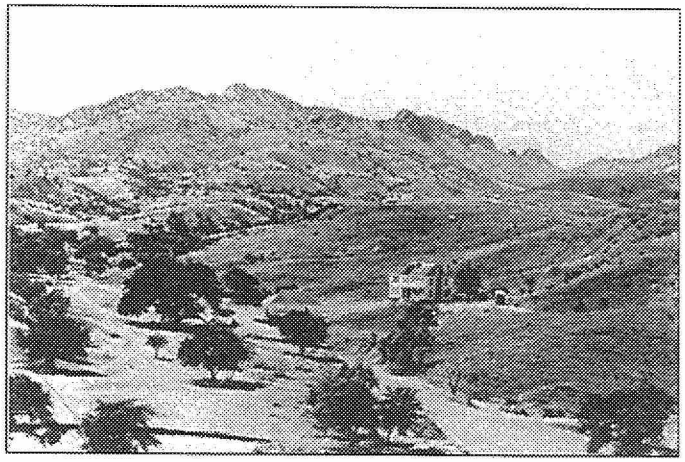


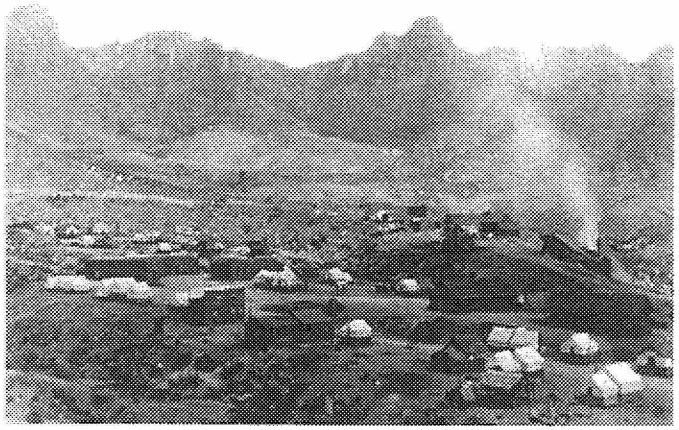


Rosemont Project Site

HUDBAY

- Rosemont-Helvetia Mining District
  - First mining claims in 1870s
  - Rosemont Smelting & Mining Co. established 1885
  - More than 30 mining projects operated
  - Work stopped at the site in 1926
- Modern technology opens opportunity for deeper ore deposits





Key Rosemont Project Features

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- Open pit copper mine
  - Base rock primarily limestone - substantially reduces potential for acid formation and metals leaching from waste rock
- Processing plant and facilities
  - Heap leach pad/SX circuit removed from Barrel Alternative due to space/operational constraints, comments on DEIS
- "Dry-stack" tailings – increases water recovery and perimeter buttress allows reclamation of tailings during operations
- Waste rock storage area - designed to allow concurrent reclamation
- Water for operations - withdrawn in Santa Cruz River Valley (west side of mountain range) under state permit allowing use of groundwater for mineral extraction
  - Mitigation through CAP water recharge. Green Valley's Community Water Co. pipeline paid by HudBay, per leasing wtr. rights.
  - Well-owners protection insurance provided to neighboring residents
- Power for operations - power and water lines co-located in a utility corridor that crosses state land (west side of mountains) to project site
  - Certification of Environmental Compatibility issued by ACC

Economic Impact

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During Construction:

- Create 2,552 direct jobs and **4,060 total jobs**
- Generate **~$240 million in total labor income**
- Capital expense almost **$2 billion** over three year period

During Operations:

- Directly and indirectly **employ over 1,000 people**
- High paying jobs **wages > 2x current median income** in Pima County.
- Wages base case **$600M (upside of $ 1 billion)**
- **~ $140 million** paid revenues to State and local governments reserve life of the mine
- Total spending of **$7 billion dollars** to build and operate

est. 20 yrs.
varies w/ copper price

Sources:

Forest Service Final Environmental Impact Statement for the Rosemont Copper Project – 2013
Rosemont's 43-101 Report – 2017

NEPA Process

HUDBAY

HISTORY OF NEPA PROCESS

Date	Submittal
July 2006	Draft MPO submitted to CNF
July 2007	MPO resubmitted to the CNF with changes
March 2008	Start of Scoping
October 2011	Draft EIS Issued
October 2013	Section 106 MOA signed
October 2013	Biological Opinion
December 2013	Final EIS Issued
June 2014	Objection Process Completed
2015/2016	Two SIRs prepared – jaguar photographed in project vicinity, data dump of old records by BLM, attempt to reduce uncertainty concerning impact of groundwater drawdown on surface water
April 2016	Amended Biological Opinion issued
June 2017	ROD Issued
Currently	MPO being finalized – submitted June 2017

CWA Section 404 Permit

HUDBAY

Date	Submittal
May 2009	Preliminary JD Submitted
April 2010	404b1 site alternatives analysis submitted
July 2010	404 permit application submitted
August 2010	Corps returned 404 permit application
December 2010	Resubmittal of 404 permit application
September 2011	Draft EIS issued with project description, 404b1, and mitigation concept
October 2011	Resubmittal of revised 404 permit application
November 2012	Draft HMMP submitted (permittee responsible mitigation)
January 25, 2013	EPA Comments on Draft HMMP submittal
February 2013	AZGF developing ILF for Sonoita Creek Ranch
March 2013	Corps discussed possibility of ILF at Pantano Dam with PCRFCD and TAS
September 2013	Corps approved mitigation summary for inclusion in Final EIS
November 2013	Final EIS issued with 404b1 alternatives analysis and mitigation
February 12, 2014	Corps notified Rosemont full HMMP due on April 1, 2014
April 1, 2014	Submittal of full HMMP
April 16, 2014	Corps provided technical comments to Rosemont
April 24, 2014	Response to technical comments provided via HMMP addendum
May 21, 2014	Corps met with Rosemont to provide verbal analysis of credits
September 26, 2014	Hudbay submits revised HMMP for Rosemont Project
April 4, 2016	Submittal of title reports and mapping
July 26, 2016	Decision referred to South Pacific Division

Section 7 Consultation

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- Discussion with FWS during 2011-2012 (FWS would not initiate consultation until Draft EIS issued)
- Consultation initiated in May 2012
- Biological Opinion issued in October 2013
- Consultation reinitiated in June 2016. Decision to reinitiate based on:
  - Jaguar/Ocelot sighting
  - Additional investigation of groundwater drawdown impact on surface water documented in 2015 SIR
  - New species listings (yellow-billed cuckoo and northern Mexican gartersnake)
- "Reinitiated" Biological Opinion issued in April 2016
  - Used "worst case" scenario under groundwater models—impacts exaggerated, not reasonably certain to occur.
  - Used recent drought conditions as surrogate for climate change—highly speculative
  - Additional conservation measures added to action

Section 106 Consultation

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TRIBAL CONCERNS

- Section 106 Memorandum of Agreement signed by the ACHP, the Forest Service, the Corps, Arizona State Museum, Arizona State Land Department, the State Historic Preservation Officer, Rosemont, and the Mescalero Apache Tribe
- Lengthy consultation process and remains a high priority for Rosemont
- Historic Properties Treatment Plans (HPTP) developed for Rosemont Project site and for the Utility Corridor.
- Mitigation, in addition to required recovery activities, include:
  - Access for tribal members for ceremonial purposes and resource recovery efforts
  - Development of materials for schools to describe archaeological findings available on the Forest and Rosemont websites
  - Development of cultural awareness training materials
  - Development of a standing display for the Rosemont Project visitor's center describing the 7,000 years of occupation, the importance of Ce:wi Duag, and the recovery efforts
  - Incorporation of culturally significant plants into the reclamation seed mix

State/Local Environmental Permits

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- Arizona Department of Environmental Quality
  - 401 Certification and amendment
  - Aquifer Protection Permits
  - Class II Air Quality Permit (and permit renewal)
  - Stormwater Permits for construction and operations (coverage under AZPDES MSGP for Mining and CGP)
- Arizona Department of Water Resources - Mineral Extraction Permit (groundwater use)
- Arizona Corporation Commission - Certificate of Environmental Compatibility for powerline placement
- Arizona Department of Transportation - Encroachment Permits for intersections at access roads
- Pima County Flood Control District Flood Control Permit for scour along pipeline

Project Design - Mitigation

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DESIGNS WERE BASED ON "BEST AVAILABLE" TECHNOLOGY

- Greatly reducing water usage and land requirements by using Filtered ("dry stack") Tailings Technology
- Waste rock segregation plan to ensure geochemical isolation of potentially acid generating materials
- Reducing air emissions by using mining equipment with the highest (Tier 4) emission standards available.
- Controlling dust emissions with high efficiency cartridge dust collectors.
- Reducing visual impacts through concurrent reclamation and re-vegetation practices on all exterior slopes of the landform.
- Utilizing cattle during reclamation to aid the land rehabilitation.
- LED outdoor lighting reducing light pollution and sky glow.

Sonoita Creek Ranch, 404 Mitigation

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ROSEMONT PROPOSAL

- 1,580 acres of land, 590 acre-feet of water rights
- *Reestablishment* of 57.4 acres of ephemeral channels through historic floodplain
- *Reestablishment* of 34.6 acres of floodplain and xeroriparian buffer habitat associated with the channels
- *Rehabilitation* of 12.1 acres of Sonoita Creek channel and buffer
- *Enhancement* of 6 acres of existing ponds including open water and wetlands
- *Enhancement* of 21.9 acres of existing ephemeral channel through exclusion of cattle grazing
- *Enhancement* of 66.3 acres of existing riparian buffer habitat through exclusion of cattle grazing
- *Rehabilitation* of 117.8 acres of Sonoita Creek Floodplain uplands through recontouring, tilling and seeding

On-going Monitoring

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- FS-GW-01 – Monitoring of waste rock for seepage
- OA-GW-06 – Monitoring at point-of-compliance wells under APP
- FS-GW-02 – Water quality monitoring beyond point-of-compliance wells
- FS-GW-03 – Additional operational waste rock and tailings characterization during mine operation
- FS-BR-22 – Monitoring to determine impacts from pit dewatering on downstream sites in Barrel and Davidson Canyons
- OA-GW-06 – Monitoring at point-of-compliance wells under APP
- FS-GW-04 – Periodic update and rerunning of pit lake geochemistry model throughout life of mine.
- FS-BR-27 – Periodic validation and rerunning groundwater TT model throughout life of mine
- OA-SW-01 – Testing of storm water on project site
- RC-SW-01 – Continued operation of and data gathering at USGS flow gage in Barrel Canyon

Ground Water Quantity

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- Groundwater drawdown in Cienega Creek watershed highly speculative
  - Streams with perennial water distant from mine pit, hydrologic connection uncertain
  - Erroneous use of models to predict very small changes in groundwater table, creates false impression of precision
- Recharge Program
  - Voluntary mitigation measure to recharge 105% of water pumped from supply wells, nearly 45,000 ac-ft of water stored to date (roughly half the mine life), included in EIS as project requirement
  - Partnering with local water company to ensure it is able to take delivery of its CAP allocation for the first time ($25 million project)
- Water Efficiency (e.g., dry stack tails)
  - Dry stack tailings reduce water usage by approximately 50% compared to traditional slurry tailings
- Well Owners Protection Program
  - Well owner protection programs for homeowners potentially impacted by operations

Ground Water Quality

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- The Arizona Department of Environmental Quality has assured protection of water quality through issuance of all necessary permits:
  - Aquifer Protection Permits (groundwater)
  - Stormwater Permits (surface water runoff)
  - 401 Certification (fill activity)
- Geochemical testing performed prior to permitting and required throughout the life of the project
- Host rock primarily limestone skarn, neutralizes acid – materials management program to ensure any suspect materials are isolated to reduce risk of ARD
- Total sulfide content of host rock is low

Surface Water Quantity

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- Permanent reduction in stormwater runoff from Barrel Canyon estimated at 17%
  - 30-40% during operations
- In six years of monitoring at the USGS gage, runoff from Barrel Canyon has ranged from 42 to 188 ac-ft/yr - low flow year is a 61% reduction from the average annual flow
- ADEQ has the ability to require replacement of stormwater flows under the Surface Water Mitigation Plan (part of ADEQ's 401 Cert.).
- The Corps is requiring replacement for waters by closing stock tanks in the Corps mitigation plan allowing water to flow downstream
- Reduction in flow at Davidson Canyon OAW modeled to be 4.3%
  - FEIS acknowledges that these modeled reductions "are likely overestimated" [p.535]
- Reduction in flow in Cienega Creek OAW (below Davidson Canyon) modeled to be 0.3-1%
- Stormwater runoff models used annual rainfall across entire basin, overestimating runoff

Surface Water Quality

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- The only water leaving site at any time will be stormwater (no process water), water will be routed around mine facilities, no contact
- Testing of current, unimpacted stormwater runoff has found exceedances of applicable surface water quality standards for seven constituents
- Project's stormwater permit prohibits any discharge that would "cause or contribute to an exceedance of an applicable water quality standard"
- Comprehensive monitoring network was approved by ADEQ
  - Will characterize flow and water quality in Barrel Canyon (2 stations) and Davidson Canyon (5 stations)
  - Ability to monitor surface water quality at several locations in the watersheds, stormwater analysis of constituents as per MSGP and SWPPP
  - Stations locations to isolate impacts of tributary inflows, so the network data can be used to identify potential sources (natural, Project-related, or non-Project related) and changes in the drainage network

Developments & Next Steps

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- U.S. Fish & Wildlife Service Final Biological Opinion – April 2016
- Record of Decision from the U.S. Forest Service – June 2017
- Next Steps:
  - Forest Service Mine Plan of Operations approval
  - United States Army Corps of Engineers ROD and 404 Permit
  - No activities until MPO and 404 issued

· bat delisted
· jaguar/ocelot monit.