APPENDIX B

EUREKA MOLY LLC
WATER RESOURCES MONITORING PLAN

Mount Hope Mine Project
Water Resources Monitoring Plan

1) This Water Resources Monitoring Plan (WRMOP) has been developed by Eureka Moly, LLC (EMLLC), in conjunction with the BLM, Eureka County and Nevada Department of Wildlife (NDOW). EMLLC proposes this WRMOP to provide a means to assess impacts to water resources from the Mt Hope Mine Project, currently the subject of an Environmental Impact Statement (EIS) being conducted in the Battle Mountain BLM Mount Lewis Field office (MLFO). As such, it is based on Mt Hope Mine potential impacts to BLM-administered resources as predicted by the groundwater modeling conducted to support the EIS. EMLLC may also have additional monitoring responsibilities associated with the Water Pollution Control Permit administered by Nevada Division of Environmental Protection, water rights administered by the Nevada Division of Water Resources (NDWR), or other permit or regulatory programs. This WRMOP is intended to accompany the Plan of Operations (POO) and only addresses the POO and EIS requirements as administered by BLM.

2) EMLLC will install newly proposed monitoring wells diligently upon receipt of the Record of Decision (ROD) and acknowledgment of cultural clearance of the locations by the Nevada State Historic Preservation Office and BLM. The intent is to provide for monitoring of baseline data from the new wells prior to changes induced by pumping or pit dewatering.

3) Mitigation of project-related impacts may be required by BLM (or NDWR) based on the degree of impact identified by the data collected under this WRMOP. Potential mitigation elements and thresholds are not discussed in this document.

4) Revisions to the monitoring program may be warranted in the future. This WRMOP is considered to be a living document that will be modified to accommodate changes in the hydrologic understanding of the area, data collected, advances in monitoring methodology, and other reasons as appropriate.

5) EMLLC will be responsible for collecting, managing, and reporting monitoring data. EMLLC may propose modifications to the WRMOP based on the data collected under this plan.

6) EMLLC will provide monitoring data collected under this WRMOP on an annual basis to BLM and members of the Technical Advisory Panel. A written annual report will be provided and a meeting will be scheduled during which EMLLC will present the annual report data.

7) A Technical Advisory Panel (TAP) is proposed to provide stakeholders with access to hydrologic monitoring data and to have a venue to bring forth their comments and concerns. TAP membership and member roles and responsibilities would be developed with BLM upon project approval.

8) Peak groundwater extraction rates of up to 11,300 acre-feet annually (afa) are proposed, with the majority of groundwater coming from the Kobeh Valley wellfield and the remainder coming from pit dewatering operations. Water flowing to the pit is anticipated to come from Kobeh Valley and Diamond Valley, with the majority from Diamond Valley. Based on predicted dewatering rates, the Diamond Valley withdrawal rate will be approximately 460 gpm (740 afa) near the end of mining. The groundwater extracted for mining use will be consumptively used in processing activities of the Project (i.e. no water will be returned to the aquifer).

9) As previously stated, the purpose of this Monitoring Plan is to identify and characterize changes to the hydrologic environment that could be caused by groundwater withdrawals for the Mt Hope Mine. It is recognized that impacts to water resources may occur from natural processes, non-project related water resource development, and land management practices, as well as from the Mt Hope mining operation.

10) Specific objectives of this WRMOP are to:
    - Confirm or improve the understanding of the hydro-geologic system.
    - Measure changes to surface water flows and groundwater levels caused by the groundwater withdrawals for the project.
    - Characterize impacts to streams, seeps and springs caused by the project.
    - Evaluate impacts to vegetation and/or wildlife habitat caused by the project.
    - Support periodic updates to the hydrologic model to improve the predictive quality of the model.
    - Provide an early warning capability to detect adverse impacts before they become unmanageable

11) Monitoring elements include measuring water extraction, surface water (streams and springs) flow, groundwater elevations, health and trends of wetland, riparian and phreatophyte vegetative communities, water quality, and meteorological data. Pre-development data will be collected to provide a baseline against which to assess data collected after the project pumping begins.

12) Monitoring locations, parameters, and frequencies have been selected to facilitate identification and assessment of impacts. Thus, an overview of the predicted impacts is warranted:
    - Significant ground water consumption in Kobeh Valley is expected to remove water from storage and lower groundwater elevations in portions of Kobeh Valley.
    - Reduction of spring or surface water flows in portions of Kobeh Valley is possible as a result of the lowered groundwater levels.
    - Groundwater drawdown in the extreme western portion of Diamond Valley, in the vicinity of Tyrone Gap, is predicted to occur as the open pit extends below the water table.

- Predicted impacts to groundwater in Diamond Valley are minimal. Current data suggests that the hydrologic interconnection between Kobeh Valley and Diamond Valley is limited. Historical data document a significant reduction in water levels in Diamond Valley due to extensive agricultural uses of groundwater.
- As the cone of groundwater depression propagates to the north from the well field or to the north and northwest from the pit area, it could encroach upon the southernmost or south-easternmost portions of the Roberts Mountains. This could result in reduction of spring or surface water flows or lowering of shallow groundwater tables that support wet meadow complexes and associated wildlife habitat in these areas.
- Water rights within the cone of depression could be affected: Appropriated surface waters could experience diminished flows. Appropriated groundwater could experience groundwater elevation declines which could impact well efficiencies or pumping costs.
- Ground subsidence and development of fissures at the ground surface could occur due to removal of interstitial water from a substantial volume of alluvial sediments in Kobeh Valley.
- In general, the potential for impacts increases both with proximity of a given resource to the proposed well field and with increased duration of pumping.
- Figures 1 and 2 depict the area that is predicted to experience groundwater drawdown in excess of ten feet at 44 years following project start-up. Figures 1 and 2 also show monitoring locations selected for the WRMOP.

13) Data collection completed by EMLLC will be used by EMLLC to assist in defining baseline conditions. EMLLC has also collected and compiled available water resources data and information in Kobeh Valley, Diamond Valley, Pine Valley, and surrounding areas, including data collected by Eureka County, the USGS, and the NDWR. This information includes location of existing supply and monitoring wells, groundwater extraction rates, groundwater level measurements, flow rates at springs and streams, water quality, and precipitation data.

14) To provide appropriate coverage of the potentially affected area, EMLLC will construct 14 new monitoring wells and observe their water levels on a daily basis utilizing down-hole transducers and data loggers. The preliminary proposed location of these wells is shown on Figures 1 and 2; actual locations may be adjusted in consultation with the BLM, NDWR, and/or TAP. These wells are generally near the extent of the area predicted to experience drawdown in excess of ten feet at Project Year 44, and will provide a sentinel function.

15) As part of the wellfield construction, it is anticipated that a test well would be drilled near each planned production well location. The test wells would be converted to monitoring wells and equipped with down-hole transducers and data loggers for continuous monitoring. The anticipated test well/monitor well locations are within the well field corridor as shown on Figures 1 and 2.

16) In addition to collecting data, EMLLC will compile data collected by USGS, NDWR and Eureka County that is made publicly available and use this data to refine and calibrate the numeric model. EMLLC will incorporate data from the monitoring sites shown on Figures 1 and 2, provided that these data continue to be collected and made available by USGS and NDWR. Eleven USGS sites are considered to provide important coverage, and EMLLC will monitor these locations if USGS discontinues this monitoring (see Figures 1 and 2, and Table 1).

17) As provided in Figure 1, EMLLC will provide for the monitoring of flows in

- Steiner Creek in southeast Grass Valley, west of Kobeh Valley
- Pine Creek in southern Monitor Valley, south of Kobeh Valley; and
- Allison Creek in Antelope Valley, south of Kobeh Valley.

These regional streams will serve as analogs to provide improved understanding of seasonal or regional conditions that may be impacting the flows in perennial streams. Stage- flow relationships will be established at these locations and the streams will then be equipped with pressure transducers to allow continuous measurement.

18) The information collected pursuant to this WRMOP will be entered by EMLLC into a project database on a regular basis, once it has been checked for laboratory quality control and quality assurance procedures, generally reflecting the monitoring interval.

19) EMLLC has developed a numeric model to simulate the groundwater flow system and the model will be updated to incorporate the data collected for this WRMOP. EMLLC will update the model after recovering 6 months of post-operational monitoring data. Thereafter, EMLLC will update the model on a schedule to reflect the requirements of the BLM.

20) EMLLC will analyze water chemistry to assist in evaluating water source contributions for the specific monitoring locations.

21) EMLLC will implement documented quality assurance and quality control procedures. Monitoring data will be recorded using a standardized (NDEP-compliant) protocol and format for each monitoring event. Protocols will be submitted to BLM for approval. It is anticipated that protocols will be based on those described by Rantz and others (1982) for surface water flow monitoring, Lapham and others (1995) for groundwater level monitoring, and Wilde (2005) for water sampling. Laboratory analyses will be conducted by Nevada-certified laboratories using standard laboratory quality control procedures.

22) EMLLC will survey production wells, monitoring wells and surface water locations to establish ground surface and measuring point elevations.

23) Tables 1 and 2, provided at the end of this document, lists the proposed monitoring site locations, type of monitoring, monitoring frequency and a brief rationale for selecting

each location, Wells identified in Table 1 include both existing wells and wells that EMLLC proposes to construct upon project approval. Some wells are located within pit limits that would be mined out as the project advances, and these locations would be dropped from the monitoring plan at that time. Site locations are shown on the attached figures. The monitoring sites in Tables 1 and 2 are organized by locations corresponding to those shown on the attached figures. The monitoring sites were selected in consideration of the type of data to be collected and the potential impact they are designed to evaluate and assess, as described below.

a. Production Wells: Extraction rates and groundwater levels will be measured continuously (daily readings following an initial period of hourly readings) in production wells.

b. Monitor Wells: Monitoring wells provided in Figure 1 and 2, and as amended in the future under this plan will be monitored to determine depth to groundwater, according to the frequency provided in Table 1. This data is anticipated to assist in characterizing the extent of drawdown within the well field and open pit areas and the propagation of the drawdown away from those areas. Transducers will be placed in the new monitoring wells to provide for continuous monitoring (daily readings following an initial period of hourly readings). It is recognized that the data collection frequency may be adjusted at BLM's direction

c. Surface Waters: Selected springs and surface flow sites in Kobeh Valley, Diamond Valley, and Pine Valley will be monitored to determine flow rates. Continuous flow recording devices will be installed at Roberts Creek, Pete Hanson Creek, Birch Creek, South Fork of Henderson Creek, Vinini Creek, and Tonkin Springs. For low flow conditions or where flow is diffuse on the ground surface, flow measurements may not be practicable, and flow would be estimated.

   Site selection for surface water flow monitoring seeks to generally measure flow within perennial reaches, while considering aspects such as accessibility and channel morphology. At each site, flows and depths will be measured monthly to establish a stage-flow relationship. Pressure transducers will be installed for hourly measurement of head, which will be converted to flow via the stage-flow relations.

d. Baseline chemistry analyses will be completed at all water monitoring sites provided within this plan. Future water chemistry analyses will be conducted as warranted. The suite of baseline parameters will consist of NDEP Profile II constituents plus isotopes of oxygen and hydrogen.

e. Vegetation monitoring will be conducted on transects to represent four wet meadow complexes in the Roberts Mountains to measure species composition, species richness, and plant cover. Minimal impact (hand-augered) monitoring wells or other field assessment will be conducted to identify the source of water

that supplies these meadows. The four wet meadow complexes include a pair relatively close to the open pit and well field, and a pair outside of the predicted area of drawdown.

Vegetation monitoring will also be conducted at representative transects in the lower portions of Kobeh Valley and in the lower portions of Roberts Creek. Vegetation monitoring will also be conducted in the Roberts Mountains to augment the larger-scale remote-sensing monitoring described in subsection "f" below.

f. Remote sensing will be conducted to assess vegetation distribution in the Roberts Mountains. The remote sensing will allow the relatively large areas to be monitored economically, provide a more extensive monitoring data set and reduce potential observer bias.

g. Precipitation data will be collected hourly at the existing meteorological station located at Mt Hope. High altitude precipitation storage and measuring sites will be established in the Roberts Mountains, to help in understanding the relationship between precipitation and elevation in this area. Regional data from BLM or NOAA stations will also be evaluated periodically to better define regional and local meteorological inputs.

h. Macroinvertebrate monitoring will be conducted in Roberts Creek, Henderson Creek and Vinini Creek to provide an indication of the ecological health of these streams.

i. Subsidence monitoring will be conducted in Kobeh Valley to measure ground subsidence in response to production water pumping, identify the formation of any fissures caused by pumping, and quantify the rate of growth of any fissures that develop from pumping.

REFERENCES

Lapham, W.W., Wilde, F.D., and Koterba, M.T., 1995, *Ground-water data collection protocols and procedures for the National Water-Quality Assessment Program: Selection, installation, and documentation of wells, and collection of related data:* U.S. Geological Survey Open-File Report 95-398, 70 p.

Rantz, S.E., et al., 1982. *Measurement and computation of streamflow,* U.S. Geological Survey Water Supply Paper 2175, Volumes 1 and 2, 631 p.

Wilde, F.D., 2005, *National field manual for the collection of water-quality data:* Book 9, Handbooks for Water-Resources Investigations, U.S. Department of the Interior and the U.S. Geological Survey.

Table 1 – Hydrologic Monitoring

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
Diamond Valley Groundwater	GMI-PDT-1	Depth to Water	Continuous	Vinini hornfels	Pit area groundwater drawdown monitoring
	GMI-PDT-2	Depth to Water	Continuous	Vinini and hornfels	Pit area groundwater drawdown monitoring
	GMI-PDT-3B	Depth to Water	Continuous	Vinini Hornfels	Pit area groundwater drawdown monitoring
	IGMI-152	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGMI-155	Depth to Water	Continuous	Qtz Porphyry	Pit area groundwater drawdown monitoring
	IGMI-156	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGMI-157	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGM-169	Depth to Water	Continuous	Vinini Hornfels	Pit area groundwater drawdown monitoring
	IGMI-226P	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGMI-228P	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGMI-230P	Depth to Water	Continuous	Tuff	Pit area groundwater drawdown monitoring
	IGMI-232P	Depth to Water	Continuous	Vinini Fm	Pit area groundwater drawdown monitoring
	IGMI-233P	Depth to Water	Continuous	Tuff	Pit area groundwater drawdown monitoring
	IGMI-MH-248	Depth to Water	Continuous	Bedrock	Pit area groundwater drawdown monitoring
	NDWR-15462	Depth to Water	Continuous	Alluvium	Pit area groundwater drawdown monitoring
	MH-300	Depth to Water	Continuous	Alluvium	Monitoring groundwater gradient changes in Tyrone Gap with MH –

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
Diamond Valley Groundwater					301
	MH-301	Depth to Water	Continuous	Alluvium	Monitoring groundwater gradient changes in Tyrone Gap with MH – 300
	MH-302	Depth to Water	Continuous	Alluvium	Monitor influence of potential increased transmissivity zone through Whistler Range.
	MH-303	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation trend on west side of Diamond Valley; Sentinel well.
	MH-304	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation trend on west side of Diamond Valley; Sentinel well.
	MH-305	Depth to Water	Continuous	Alluvium	Monitor drawdown east of pit.
	IGMI-158	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation trend on west side of Diamond Valley; Sentinel well.
	IGMI - 236P	Depth to Water	Continuous	Vinini Fm	Monitor groundwater elevation change in Whistler Range; Sentinel well.
	Romano Well	Depth to Water	Continuous	Vinini Fm	Monitor groundwater elevation trend on west side of Diamond Valley; Sentinel well.
	MH – 306 (153 N21 E52 10AAAC1)	Depth to Water	Continuous		Monitor groundwater elevation trend on west side of Diamond Valley
	MH – 307 (153 N20 E52 26AABC1)	Depth to Water	Continuous		Monitor groundwater elevation changes in Devil's Gate.
	MH – 308 (153 N20 E52 26AABC2)	Depth to Water	Continuous		Monitor groundwater elevation changes in Devil's Gate.
Diamond Valley Springs	KV-059 (Stinking)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-060 (Hash)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
	KV-061 (Railroad)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-062 (Trap Corral)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	DV -065 (Shipley)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	SP-1 (McBride)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	SP-2 (Garden pass)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	SP-3 (unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	SP-4 (Mt Hope)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	SP-7 (unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
Kobeh Valley Groundwater	All production wells	Flow and Depth to Water	Continuous	Alluvium and carbonate	Measure well field production, individual well response to pumping stress, and drawdown progression in wellfield
	GMI-RWX-228T	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	GMI-RWX-229	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	RWX -205	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH-400	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation change in alluvium on west side of Whistlers paired w/ MH-401 to assess connection between alluvium and bedrock aquifers; assess effect of inferred structure located to the east.
	MH-401	Depth to Water	Continuous	Bedrock	Monitor groundwater elevation

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
Kobeh Valley Groundwater					change in bedrock on west side of Whistlers paired w/ MH-400 to assess connection between alluvium and bedrock aquifers; assess effect of inferred structure located to the west.
	MH-402	Depth to Water	Continuous	Alluvium	Monitor drawdown at east edge of Kobeh Valley.
	MH-403	Depth to Water	Continuous	Alluvium	Monitor potential drawdown in upper Roberts Creek; Sentinel.
	MH-404	Depth to Water	Continuous	Bedrock	Monitor potential drawdown in western part of Robert's Creek watershed; Sentinel.
	MH – 405	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 406	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 407	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 408	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 409	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 410	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 411	Depth to Water	Continuous	Alluvium	Measure drawdown progression in wellfield
	MH – 412	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between wellfield and pit area
	MH- 413	Depth to Water	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between wellfield and pit area

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
	MH - 414 (139 N21 E49 25BBDA)	Depth to Water	Continuous	Alluvium	Monitoring of west side of KV wellfield drawdown
	MH - 415 (139 N21 E50 17BACC)	Depth to Water	Continuous	Alluvium	Monitoring of west side of KV wellfield drawdown
	MH - 416 (139 N20 E51 05CBCC)	Depth to Water	Continuous	Alluvium	Monitoring of south side of KV wellfield drawdown
	MH - 417 (139 N21 E51 36DCDB1)	Depth to Water	Continuous	Alluvium	Monitoring of southeast side of KV wellfield drawdown
	MH -418 (139 N21 E51 24DDDB1)	Depth to Water	Continuous	Alluvium	Monitoring of southeast side of KV wellfield drawdown
	MH – 419 (139 N20 E49 23ACCB1)	Depth to Water	Continuous	Alluvium	Monitoring of drawdown between wellfield and Bean Flat phreatophytes
	MH – 420 (139 N20 E49 24ACAB)	Depth to Water	Continuous	Alluvium	Monitoring of drawdown between wellfield and Bean Flat phreatophytes
	MH – 421	Depth to Water	Continuous	Alluvium	Monitoring of west side of KV wellfield drawdown
	RWX - 209 shallow and deep	Depth to Water	Continuous	Alluvium /Vinini	Monitoring of northwest side of KV wellfield drawdown
	MRCMW	Depth to Water	Continuous	Alluvium	Monitoring of potential drawdown in Roberts Creek watershed
	LRCMW	Depth to Water	Continuous	Alluvium	Monitoring of potential drawdown in Roberts Creek watershed
	IGM-154,	Depth to Water	Continuous	Alluvium	Pit area groundwater monitoring
	IGMI-234P	DTW and Chemistry	Continuous	Alluvium	Monitor groundwater elevation change in Whistler Range; Sentinel well.
	IGMI-235P	DTW and Chemistry	Continuous	Vinini Fm	Monitor groundwater elevation change in Whistler Range; Sentinel well.
	IGMI-237P	DTW and	Continuous	Vinini Fm	Monitor groundwater elevation

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
		Chemistry			change in Whistler Range; Sentinel well.
	TM1-B	DTW and Chemistry	Continuous	Alluvium	Monitoring of east side of KV wellfield drawdown
	Atlas 1	DTW/ pressure	Continuous	Alluvium	Monitoring northwest of predicted 10 foot drawdown contour
	Bartine Ranch Well 1, 2, 3 (flowing)	DTW/pressure	Continuous	Alluvium	Assess impact of pumping on artesian flows outside predicted 10 foot drawdown contour
	Big Windmill	DTW/pressure	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between wellfield and pit area
	Colby well	DTW/pressure	Continuous	Alluvium	Assess impact of pumping on artesian flows outside predicted 10 foot drawdown contour
	KV 064	DTW/pressure	Continuous	Alluvium	Assess impact of pumping on artesian flows outside predicted 10 foot drawdown contour
	Depco INC;	DTW/pressure	Continuous	Alluvium	Monitoring of drawdown between wellfield and Bean Flat phreatophytes
	Etcheverry Windmill	DTW/pressure	Continuous	Alluvium	Monitoring of west side of KV wellfield drawdown
	IGMI-MH-RWX-203 T	DTW/pressure	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between wellfield and pit area
	NDWR9211R	DTW/pressure	Continuous	Alluvium	Assess impact of pumping on artesian flows outside predicted 10 foot drawdown contour
	RWX- 204	DTW/pressure	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between wellfield and pit area
	KFE	DTW/pressure	Continuous	Alluvium	Monitor groundwater elevation change in transition zone between

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
					wellfield and pit area
	KFW	DTW/pressure	Continuous	Alluvium	Monitoring northwest of predicted 10 foot drawdown contour
	Treasure Well	DTW/pressure	Continuous	Alluvium	Assess impact of pumping on artesian flows outside predicted 10 foot drawdown contour
	GMI-RWX-223	DTW/pressure	Continuous	Alluvium	Measure drawdown progression in wellfield
Kobeh Valley Streams	LRC (Lower Roberts Creek)	Flow Rate; Water Quality	Continuous		Potential indirect impacts to perennial streams
	URC (Upper Roberts Creek)	Flow Rate; Water Quality	Continuous		Potential indirect impacts to perennial streams
	MH 700 (Cottonwood Canyon)	Flow	Continuous		Potential indirect impacts to perennial streams
	MH 701 (Cottonwood Canyon)	Flow	Continuous		Potential indirect impacts to perennial streams
Kobeh Valley Springs	KV-002 (Potato Canyon)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-026 (Rutabega)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts near wellfield
	KV-034 (Mud)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts near wellfield
	KV-035 (Lone Mtn)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts south of wellfield
	KV-044 (Hot)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-015 (Unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-016 (Unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	KV-020 (Unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	OT-6 (Unnamed)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
	OT-7 (Nichols Spring)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	MH - 702 (Jack Spring)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts, west side of Roberts Mtn.
	MH – 703 (Klobe Spring)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts in Antelope Valley
Pine Valley Springs	PV-059 (Dry Creek headwater spring)	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-060	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-061	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-062	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-063	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-064	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	PV-065	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
Pine Valley Springs	OT-2	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	OT-3	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	OT-5	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	OT-10A	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
	OT-11	Flow, Photograph	Quarterly		Monitor potential indirect spring impacts
Pine Valley Streams	LBC (Lower Birch Cr.)	Flow Rate	Continuous		Potential indirect impacts to perennial streams
	LHC (Lower Henderson	Flow Rate	Continuous		Potential indirect impacts to

Area	Site Name(s)	Parameters	Frequency	Formation	Rationale
	Cr.)				perennial streams.
	UHC (Upper Henderson Cr.)	Flow Rate	Continuous		Potential indirect impacts to perennial streams
	LPHC (Lower Pete Hanson Cr.)	Flow Rate	Continuous		Potential indirect impacts to perennial streams.
	UPHC (Upper Pete Hanson Cr.)	Flow Rate	Continuous		Potential indirect impacts to perennial streams.
	Tonkin Springs	Flow Rate	Continuous		Potential indirect impacts to perennial streams
	LVC (Lower Vinini)	Flow Rate	Continuous		Potential indirect impacts to perennial streams.
	UVC (Upper Vinini Cr.	Flow Rate	Continuous		Potential indirect impacts to perennial streams.
	WC (Willow Cr.)	Flow Rate	Continuous		Potential indirect impacts to perennial streams.
Pine Valley Groundwater	MH-500	Depth to Water	Continuous	Bedrock	Sentinel well in mountain block south of Henderson Creek
	MH-501	Depth to Water	Continuous	Alluvium	Henderson Creek groundwater elevations
	MH-502	Depth to Water	Continuous	Bedrock	Sentinel well in mountain block east of springs in upper Henderson Creek

Table 2 - Biological and Meteorological Monitoring

Area	Site Name(s)	Parameters	Frequency
Wet Meadow Complexes in Roberts Mountains	Three to five vegetation transects in each of the WMC, locations to be determined;	Species composition, species richness, and plant cover.	Semi-Annually (May and July)
Phreatophytic vegetation in lower Kobeh Valley	Three to five vegetation transects in each of the phreatophyte vegetation communities, locations to be determined;	Species composition, species richness, and plant cover.	Transects - Semi-Annually (April and June);
Phreatophytic and riparian vegetation in lower Roberts Creek	Three to five vegetation transects in the watershed, locations to be determined	Species composition, species richness, and plant cover.	Transects - Semi-Annually (April; June);
Phreatophytic and riparian vegetation in Henderson Creek	Three to five vegetation transects in the watershed, locations to be determined	Species composition, species richness, and plant cover.	Transects - Semi-Annually (April; June);
Roberts Mountain	Not applicable	Remote sensing (Aerial photography or satellite imagery)	Initially for entire mountain; Every two years for riparian areas.
Streams in Roberts Mountains.	Roberts Creek, Vinini Creek, Henderson Creek	Macro-invertebrate monitoring	Annually (late summer/early fall base flow)
Mine site	Existing Mt Hope met station	Temperature, precipitation, humidity, wind speed and wind direction	Hourly
Roberts Mountains	Minimum of 3 high-altitude sites in Roberts Mountains, locations to be determined.	Precipitation	To be determined

053 Pine Valley

153 Diamond Valley

Detailed Labeling of Monitoring Sites Within This Area Depicted in Figure 2

138 Grass Valley

Steiner Creek

139 Kobeh Valley

152 Stevens Basin

MH-703 (Klobe Hot Spring)

B Big Smoky Valley

Allison Creek

LANDER COUNTY

EUREKA COUNTY

151 Antelope Valley

NYE COUNTY

140A Monitor Valley

140B Monitor Valley

150 Little Fish Lake Valley

Pine Creek

Explanation

Roberts Mountains Monitoring Sites
- Stream
- Gauging Station
- Monitoring Well
- Spring

Diamond Valley Monitoring Sites
- Spring
- Monitoring Well

Kobeh Valley Monitoring Sites
- Stream
- Monitoring Well
- Spring

Wells to be Installed by EMLLC
- DV Well
- KV Well
- PV Well

- USGS Wells
- Mine Supply Well

Regional Monitoring Sites
- Spring
- Stream

- Perrenial Streams Occupied by Lahontan Cutthroat Trout
- U.S. Highway
- 2-Track / Dirt Road
- Primary Road
- State Route
- Nevada Counties
- Mt. Hope Plan of Operations Boundary
- Hydrographic Basin Boundaries
- Limit of Projected 10' Drawdown Contour at Project Year 44 Proposed Action
- Wet Meadow Complexes
- Wellfield Corridor
- Mainly Rabbitbrush and Greasewood
- Mainly Saltgrass and other Wet Meadow Grasses
- Patented Land
- Private Land
- Tailings
- Streams

EUREKA MOLY

Mt. Hope Project
Eureka County, Nevada
Water Resource Monitoring Plan
Figure 1
May 27, 2011

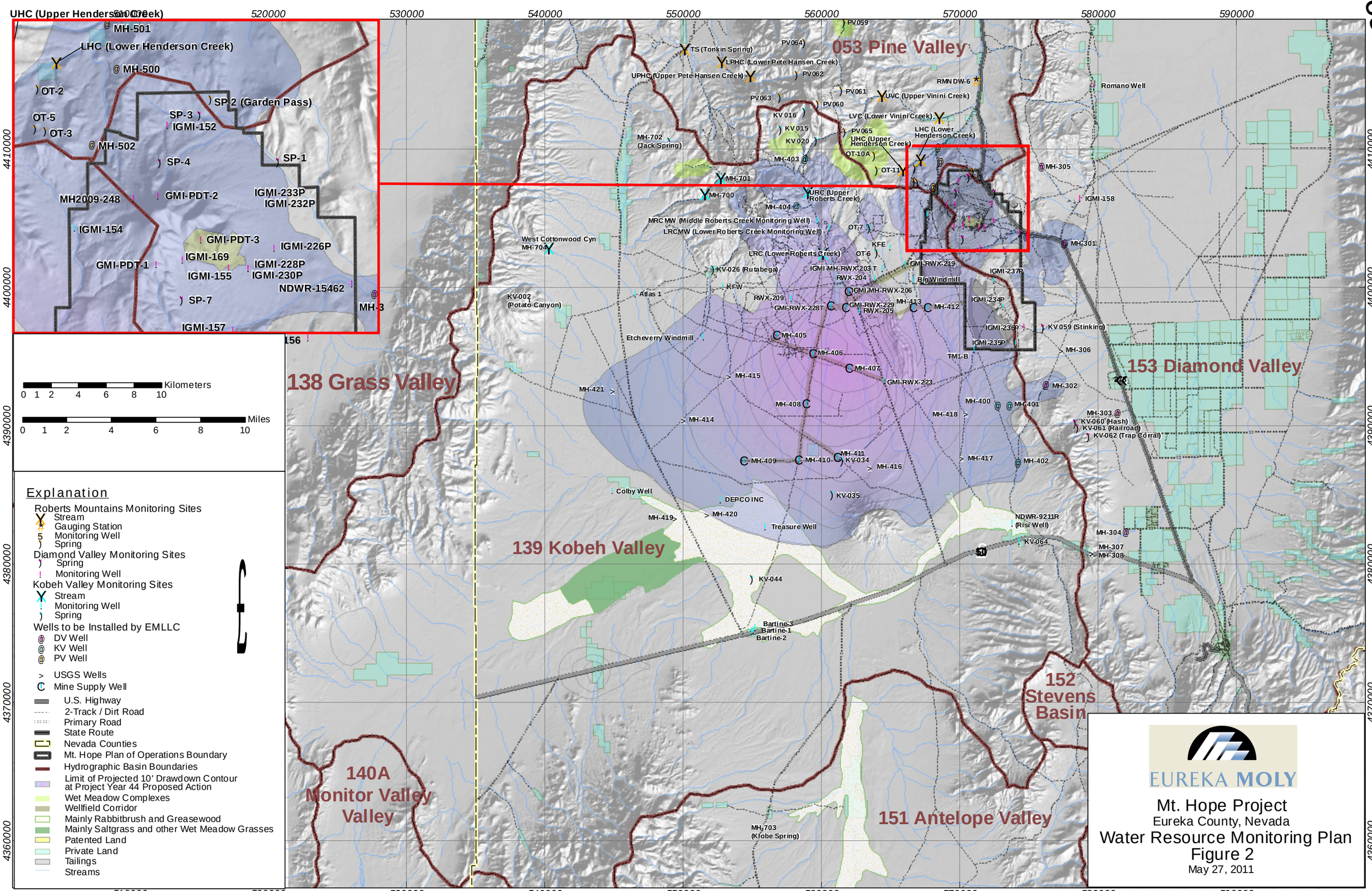
UHC (Upper Henderson Creek)
MH-501
LHC (Lower Henderson Creek)
MH-500
OT-2
SP-2 (Garden Pass)
OT-5
SP-3
IGMI-152
OT-3
MH-502
SP-4
SP-1
MH2009-248
GMI-PDT-2
IGMI-233P
IGMI-232P
IGMI-154
GMI-PDT-3
IGMI-226P
IGMI-169
GMI-PDT-1
IGMI-228P
IGMI-155
IGMI-230P
NDWR-15462
SP-7
IGMI-157
Kilometers
0 1 2 4 6 8 10
Miles
0 1 2 4 6 8 10
Explanation
Roberts Mountains Monitoring Sites
Stream
Gauging Station
Monitoring Well
Spring
Diamond Valley Monitoring Sites
Spring
Monitoring Well
Kobeh Valley Monitoring Sites
Stream
Monitoring Well
Spring
Wells to be Installed by EMLLC
DV Well
KV Well
PV Well
USGS Wells
Mine Supply Well
U.S. Highway
2-Track / Dirt Road
Primary Road
State Route
Nevada Counties
Mt. Hope Plan of Operations Boundary
Hydrographic Basin Boundaries
Limit of Projected 10' Drawdown Contour at Project Year 44 Proposed Action
Wet Meadow Complexes
Wellfield Corridor
Mainly Rabbitbrush and Greasewood
Mainly Saltgrass and other Wet Meadow Grasses
Patented Land
Private Land
Tailings
Streams
138 Grass Valley
053 Pine Valley
153 Diamond Valley
139 Kobeh Valley
152 Stevens Basin
140A Monitor Valley Valley
151 Antelope Valley
TS (Tonkin Spring)
LPHC (Lower Pete Hansen Creek)
UPHC (Upper Pete Hansen Creek)
UVC (Upper Vinini Creek)
LVC (Lower Vinini Creek)
RMN DW-6
Romano Well
MH-702 (Jack Spring)
UHC (Upper Henderson Creek)
LHC (Lower Henderson Creek)
MH-305
MH-701
MH-700
URC (Upper Roberts Creek)
IGMI-158
MRC MW (Middle Roberts Creek Monitoring Well)
LRCMW (Lower Roberts Creek Monitoring Well)
West Cottonwood Cyn MH-704
LRC (Lower Roberts Creek)
MH-301
KV-026 (Rutabega)
IGMI-MH-RWX-203 T
GMI-RWX-219
IGMI-237P
Big Windmill
KV-002 (Potato Canyon)
Atlas 1
IGMI-MH-RWX-206
IGMI-234P
GMI-RWX-228T
GMI-RWX-229
MH-412
IGMI-236P
KV 059 (Stinking)
Etcheverry Windmill
IGMI-235P
MH-306
TM1-B
MH-415
GMI-RWX-223
MH-302
MH-421
MH-400
MH-401
MH-408
MH-418
MH-303
KV-060 (Hash)
KV-061 (Railroad)
KV-062 (Trap Corral)
MH-414
MH-409
MH-410
KV-034
MH-416
MH-417
MH-402
Colby Well
DEPCO INC
KV-035
MH-419
MH-420
Treasure Well
NDWR-9211R (Risi Well)
MH-304
KV-064
MH-307
MH-308
KV-044
Bartine-3
Bartine-1
Bartine-2
MH-703 (Klobe Spring)
EUREKA MOLY
Mt. Hope Project
Eureka County, Nevada
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Figure 2
May 27, 2011