TABLE 1
Inputs for Regional Groundwater Model

a. Hydraulic Conductivities

Alluvium and Muddy Creek

Alluvium - Qal	K (ft/d)
arithmetic mean	38.5
geometric mean	15.2
harmonic mean	5.4

Muddy Creek - UMCf	K (ft/d)
arithmetic mean	3.2
geometric mean	0.39
harmonic mean	0.02

Sources

- Stauffer Chemical Company, Hydrogeologic Investigation report, March 14, 1983
- Kerr-McGee, Hydrogeological Investigation, July 1985
- Kerr-McGee Chemical: Preliminary report on a hydrogeologic investigation of channel-fill alluvium at Pittmann Lateral, Oct 19, 1998
- Errol Mongomery & Assoc: Analysis of rate of GW movement based on results of tracer and hydraulic tests, Dec 19, 2000
- Conceptual Site Model, Titanium Metals Corp Facility, Henderson, NV, April 25, 2007
- Kleinfelder, Slug test results, BMI Common Area, Nov 29, 2007
- Kleinfelder, Slug test results, Implementation of revised aquifer testing work plan, BMI Common Area, Nov 16, 2007
- Kleinfelder, Slug test results, CAMU area, January 25, 2008
- TIMET, Design Data Gap Investigation, June 12, 2009
- TIMET, Revised Remedial Design for the First Water Bearing Zone, Technical Addendum: Capture zone modeling, Oct 2009
- Converse Consultants, Limited Hydrogeologic Investigation, BMI Common Areas, Nov 29, 2009
- Geosyntec/AMPAC, Groundwater Flow Model South of Warm Springs Study Area Henderson, NV, Feb 2010
- Tronox 2010 Slug Tests for CZE Evaluation (not yet reported)

Paleochannels

	K (ft/d)	Sources
Range of K values	60 - 265	• Kerr-McGee Chemical: Preliminary report on a hydrogeologic investigation of channel-fill alluvium at Pittmann Lateral, Oct 19, 1998 • Kerr-McGee, Hydrogeological Investigation, July 1985 • Stauffer Chemical Company, Hydrogeologic Investigation report, March • Lower value of range inferred from viewing in ArcGIS the K measurement locations relative to paleochannel

Alluvial Deposits Near Las Vegas Wash

	K (ft/d)	Source
Range of K values	457 - 526	McGinley and Associates, Las Vegas Wash Initial Perchlorate Modeling Report, 2003
Extent of alluvial deposits		Based on geology map and presentation from Joe Leising of SNWA.

b. Recharge

Region	Recharge (ft/d)	Source
Residential areas	**1.3E-04 - 4.3E-04**	DBSA, Summary report for updated groundwater flow model calibration BMI upper and lower ponds area, 2009
Industrial areas	**1.3E-04 - 4.3E-04**	DBSA, Summary report for updated groundwater flow model calibration BMI upper and lower ponds area, 2009
Tuscany Golf Course	**8.33E-04 - 5.21E-03**	DBSA, Revised technical memorandum: Sources/sinks and input parameters for groundwater flow model BMI Common Areas Eastside Area, 2008
Undeveloped Areas	1.83E-05	Natural recharge rate - NDEP value based on USGS (2007) report
COH Birding Preserve	2.43E-03	COH data sent from Brenda Pholmann
Northern RIBs	1.83E-05	COH data, no longer active, used natural recharge
TIMET ponds	1.83E-05	No longer active - used natural recharge rate
Tronox ponds	2.57E-05	Plastic lined ponds, leakage rate from Peggs (2009)

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c. Evapotranspiration

Region	ET (ft/d)	Source
Phreatophytes south of Las Vegas Wash; North end of model	0.011	ET rate obtained from DBSA (2008) based on estimates by Devitt (2006). Areas of phreatophytes based on GIS map obtained from Nick Rice of SNWA.

d. Vertical Flow from Deep UMCf

Reach	Vertical gradient	Source (s)
1	-0.05	DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009
2	0.2	DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009
3	0.040	DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009
4	0.20547	• Tronox, LLC, Interim Groundwater Capture Evaluation and Vertical Delineation Report, March 2010 • Hargis and Assoc, Vertical Delineation Investigation, 2010
5	0.33	DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009
6	0.01	DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009
7	0.0635	• Tronox, LLC, Interim Groundwater Capture Evaluation and Vertical Delineation Report, March 2010 • DBSA, Tritium and Stable Isotope Sampling & Analysis, and Evaluation of Hydrogeologic Zone Connectivity, BMI Common Areas (Eastside), Clark County, Nevada, 2009

Reach	Range of conductances for GHB (ft^2/d)	
1	1.0×10^{-3} - 1.5×10^{-2}	Calculated based on vertical gradients and estimated range of vertical K values for MCf
2	2.5×10^{-3} - 2.5×10^{-2}	
3	4.7×10^{-4} - 4.7×10^{-3}	
4	2.5×10^{-3} - 2.5×10^{-2}	
5	4.0×10^{-3} - 4.0×10^{-2}	
6	1.0×10^{-4} - 1.0×10^{-3}	
7	7.7×10^{-4} - 7.7×10^{-3}	

e. Southern Boundary Condition

Specified flux boundary based on an estimate of horizontal flux in the UMCf using hydraulic gradients from wells.
flux = Kh, ave (UMCf) * gradient

Parameter	Value	Source
gradient	0.03	Horizontal gradient calculated based on head measurements in Tronox region
gradient	0.01	Horizontal gradient between Wells EW-2 and DX-161A near Southern boundary of model domain
Kh, ave (UMCf), ft/d	0.02 - 3	
min flux, ft/d	**0.0002**	
max flux, ft/d	**0.09**	

TABLE 1
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f. Northern Boundary Condition		
Constant head boundaries used based on LV Wash water surface elevation (WSE)		
Location	**WSE (ft)**	**Source**
Pabco Road	1535.33	Based on Pabco Weir construction design drawing from CCRFD
East edge of model	1492	Water surface elevation based on HEC-RAS cross sections of LV Wash from SNWA
West edge of model	1572	Water surface elevation based on HEC-RAS cross sections of LV Wash from SNWA

g. Injection/Extraction Wells		
Wells/Owner	**Combined Rate (cfd)***	**Source**
APEW/AMPAC	-10011	AMPAC, Quarterly Performance Report, Oct 1- Dec 31, 2009
AREW/AMPAC	-59679	AMPAC, Quarterly Performance Report, Oct 1- Dec 31, 2009
RIW/AMPAC	9549	AMPAC, Quarterly Performance Report, July-Sept, 2009
ART/Tronox	-52433	Tronox spreadsheet with pumping/injection rates
Interceptor wells/Tronox	-12668	Tronox spreadsheet with pumping/injection rates
Seep well field/Tronox	-110562	Tronox spreadsheet with pumping/injection rates
POSSM wells /POSSM	-31957	Data sent from Paul Sundberg, contractor for POSSM; Used October 2008 data
*Positive rate = injection, negative = extraction		

h. Recharge Trench		
	Recharge (ft/d)	
Tronox infiltration trench	0.0978875	Tronox spreadsheet with pumping/injection rates