

UPDATE ON NEVADA MINERAL PRODUCTION AND EXPLORATION

**Interstate Mining Compact Commission
Western Region Noncoal / Hardrock Minerals Symposium
Salt Lake City, Utah
March 27, 2013**

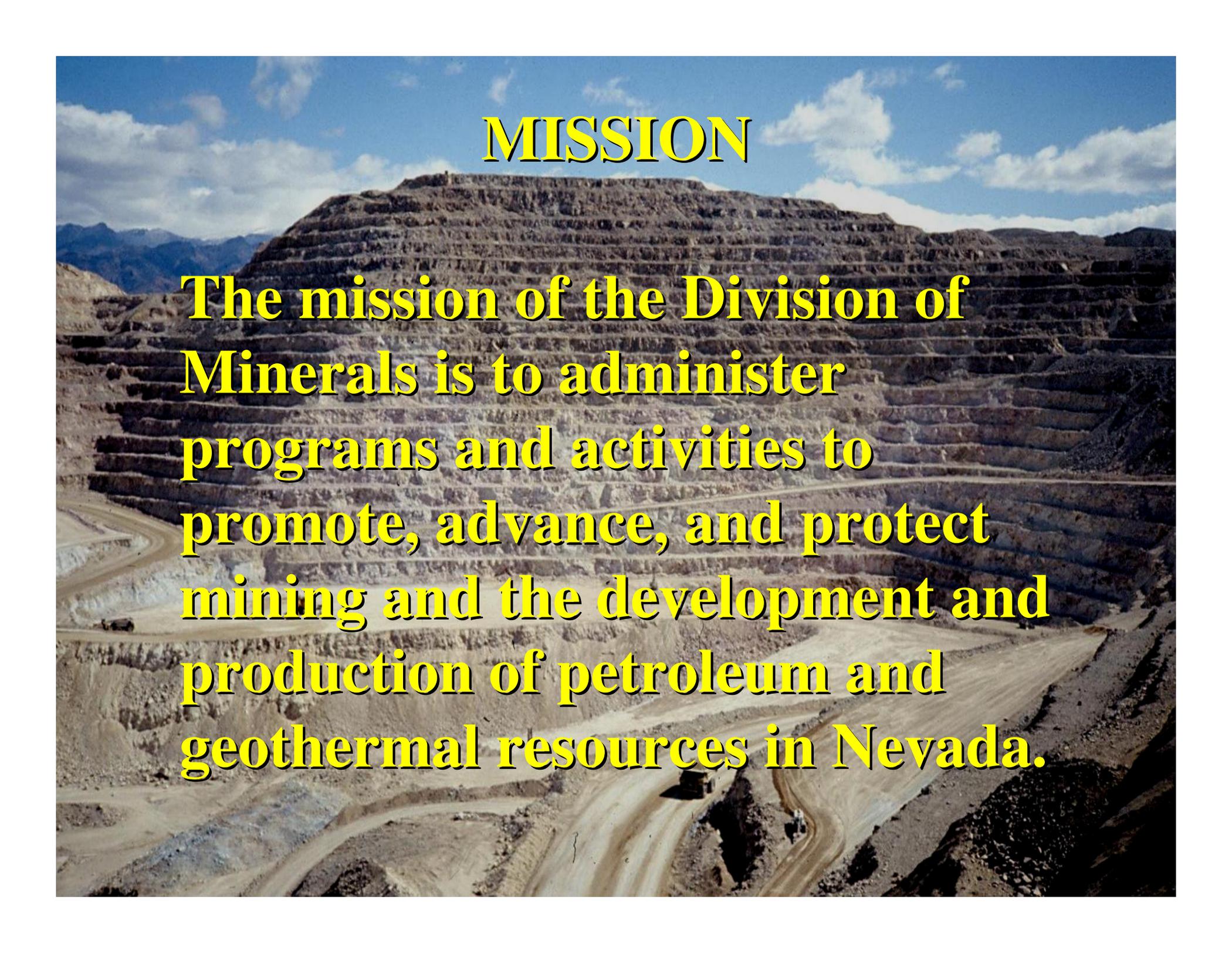


**Alan R. Coyner
Nevada Division of Minerals**



**with contributions by
Jonathan G. Price, State Geologist Emeritus
Nevada Bureau of Mines and Geology**

Photo credits to Mike Visher, Jeff Scovil, Jonathan Price, and others

An aerial photograph of a large-scale open-pit mine. The mine is characterized by numerous horizontal terraced levels, creating a stepped appearance. Several dirt roads wind through the site, and a few small vehicles are visible on the ground. The background shows a range of mountains under a blue sky with scattered white clouds.

MISSION

The mission of the Division of Minerals is to administer programs and activities to promote, advance, and protect mining and the development and production of petroleum and geothermal resources in Nevada.

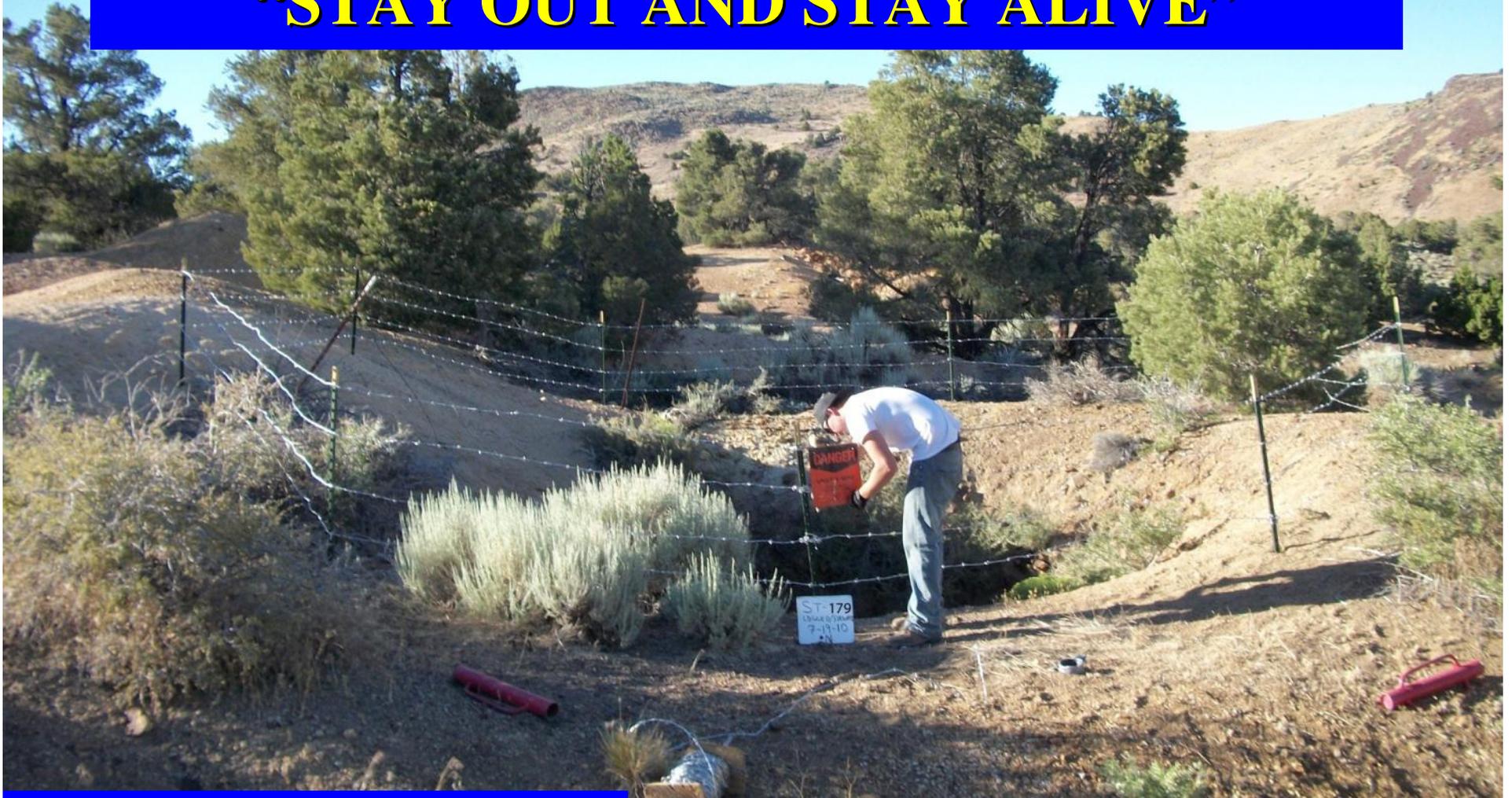
WHO WE ARE

- **State Agency and part of the Commission on Mineral Resources (CMR)**
- **CMR is 7 members appointed by the Governor from the minerals industry**
- **Offices in Carson City (9 employees) and Las Vegas (2 employees)**
- **Annual budget of \$2,400,000**
- **No general fund money in budget, all revenue from fees on minerals industry**

WHAT WE DO

- **Industry Relations and Government Affairs**
- **Abandoned Mine Lands Program**
- **Minerals Education, including the Nevada Earth Science Teacher's Workshops**
- **State Reclamation Bond Pool**
- **Mines Registry (production and exploration data on mining, oil and gas, and geothermal)**
- **Oil, Gas, and Geothermal Program**

ABANDONED MINE LANDS “STAY OUT AND STAY ALIVE”



Minimum standard for securing
– T-post and 4-strand barbed
wire fence with warning sign

17,077 discovered
13,326 secured thru 2012

AML BAT GATE PROJECTS

BEFORE



AFTER



AML EXPANSIVE FOAM PROJECTS

Tonopah Historic Mining Park



AML BACKFILL PROJECTS



2,569 SITES BACKFILLED

WF-98
BACKFILL
10-31-05

NEVADA DIVISION OF MINERALS ABANDONED MINE LANDS 2012 SUMMER INTERN PROGRAM

Accomplishments:

- ~Visited 1,505 Abandoned Mine Features in 15 Counties
- ~Identified 271 New Hazards
- ~Secured 207 Hazards
- ~Revisited or Repaired 338 Hazards

Many Thanks to These Hard-working University of Nevada Students:
L-R: Orgil Norov, Joey Winkler, Eric Dougherty, Drew Jones, Kelly Elloyan, Abijah Bauer, Kate Schnoor, and Murya Dube



EAGLE SCOUT SECURING PROJECTS



133 projects since 1992 resulting in 620 securings

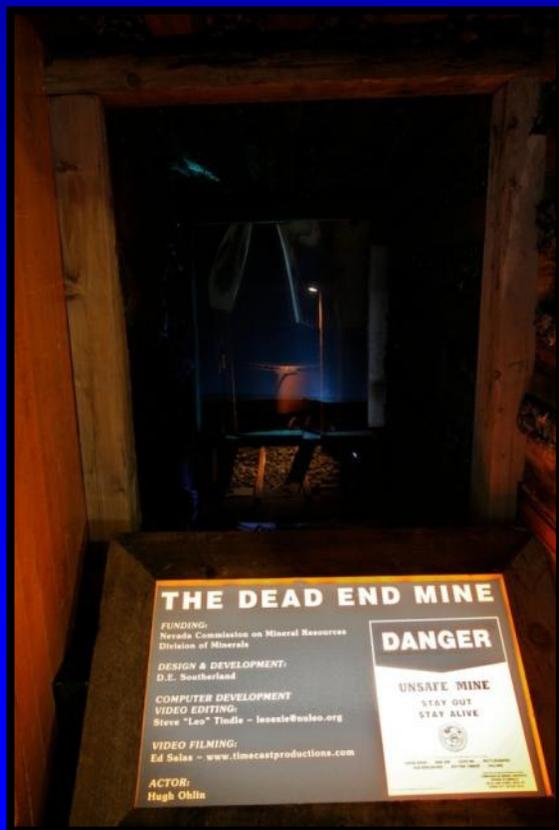
PUBLIC AWARENESS CAMPAIGN



**Brochures, bumper stickers, notebooks,
magnets, stickers, pencils, coffee mugs, flash
drives, squeeze bats and temporary tattoos**

Commission on Mineral Resources and Division of Minerals Cooperative AML Project with 4th Ward School in Virginia City

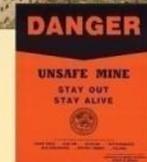
Stay Out and Stay Alive Hologram Exhibit



LOOK OUT THIS WINDOW

On the far hill is the remains of the 3200 foot deep Combination Shaft...

Now - look down at the Combination Shaft and Fourth Ward School from 3,200 feet above... **IF YOU FALL INTO THE SHAFT, THIS IS HOW FAR YOU WILL FALL!**



Would there be anything left of you to save?

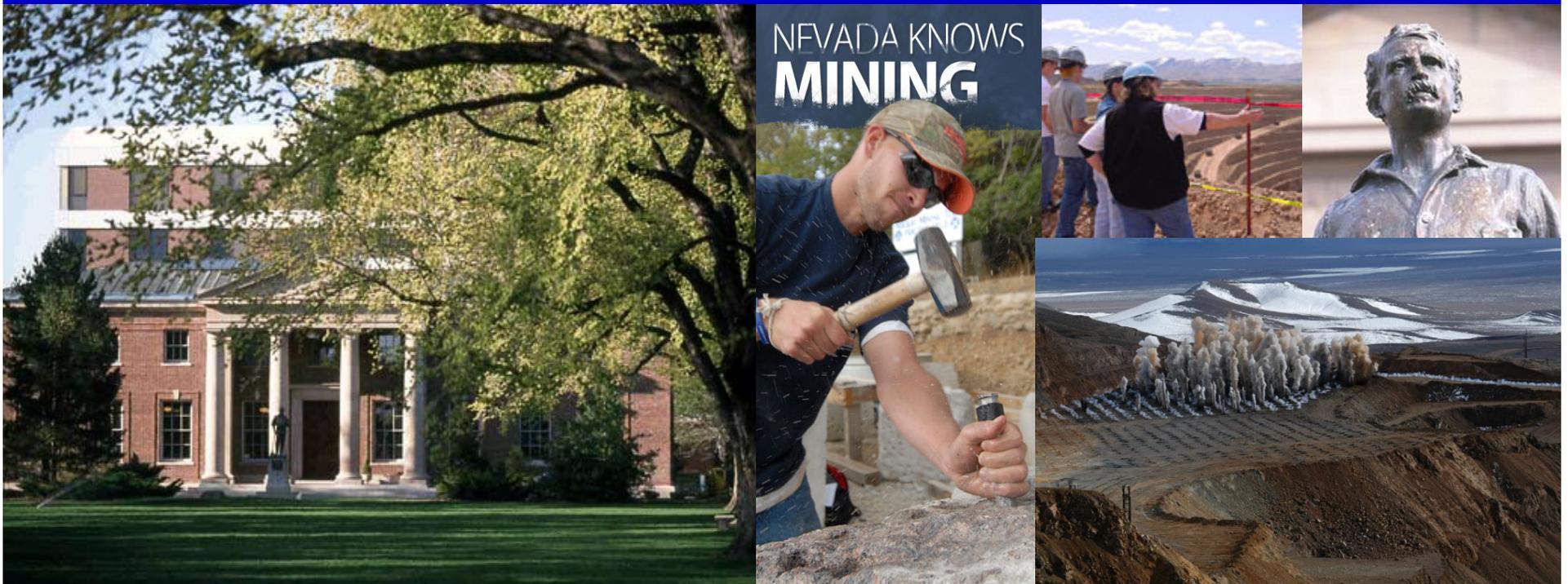
STAY OUT AND STAY ALIVE!

MINERALS EDUCATION



MACKAY SCHOOL OF EARTH SCIENCES AND ENGINEERING

- **\$2.00 of the annual \$8.50 County Mining Claim Filing Fee supports the Mackay School (\$2.0M to date)**
- **Also \$700K of support to Recruitment and Retention**



GREAT BASIN SCIENCE SAMPLE AND RECORDS LIBRARY



**Nevada Bureau of Mines and Geology - University of Nevada, Reno
on the Campus of the Desert Research Institute**

\$800K of support from the CMR for projects, sample collection and curation

NEVADA MINERAL RESOURCES INFORMATION

- **Major Mines of Nevada – NDOM**
– <http://minerals.state.nv.us>
- **Nevada Mineral and Energy Resource
Exploration Survey – NDOM/NBMG**
– www.nbmg.unr.edu/dox/es2011.pdf
- **Nevada Mineral Industry – NBMG**
– www.nbmg.unr.edu

THE MAIN POINT

10 Year Gold

High 1900.30 Low 322.10

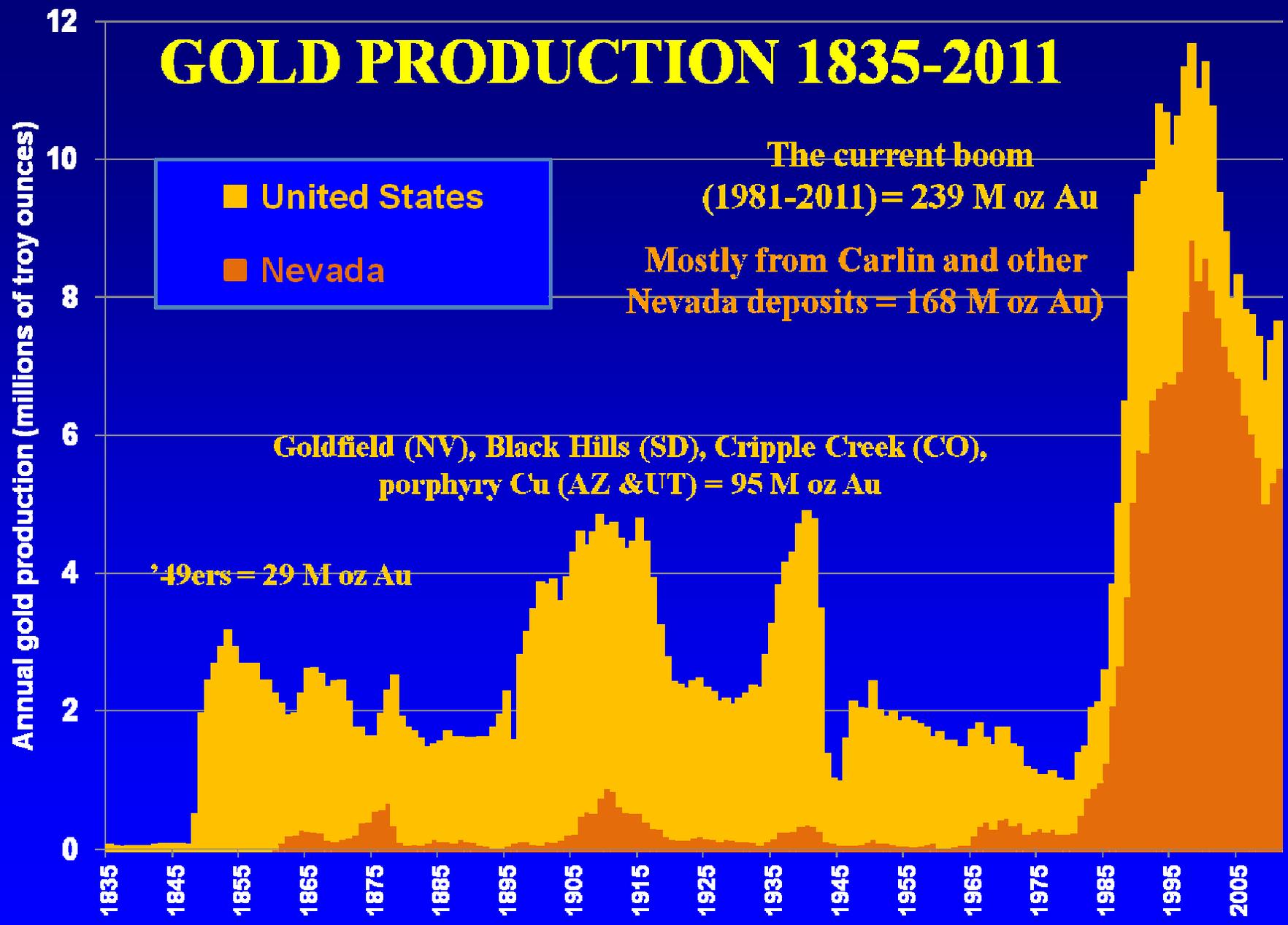


Nevada is a really great place to explore for and mine gold and many other mineral commodities

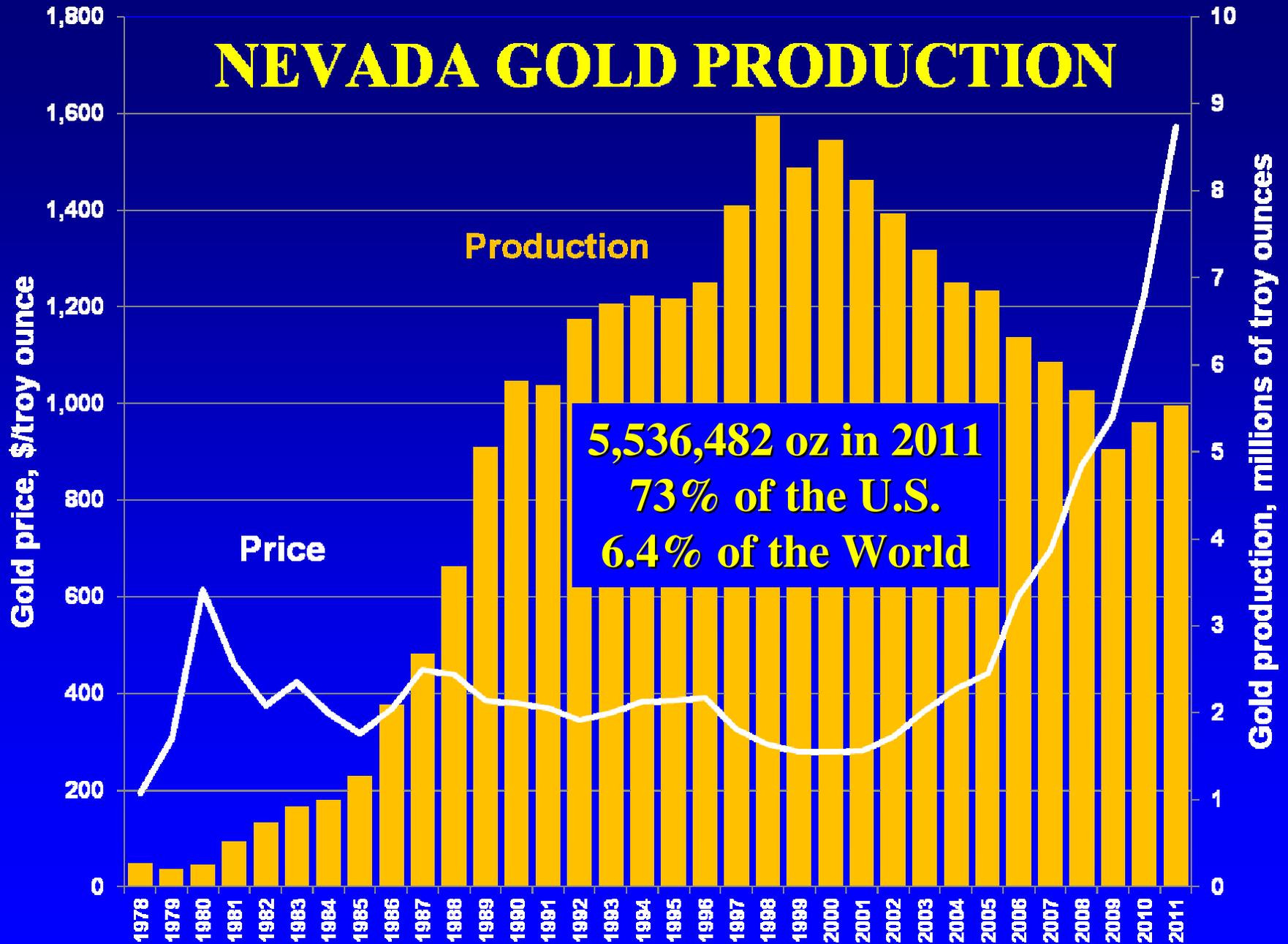
www.kitco.com

Based on New York Close

GOLD PRODUCTION 1835-2011



NEVADA GOLD PRODUCTION

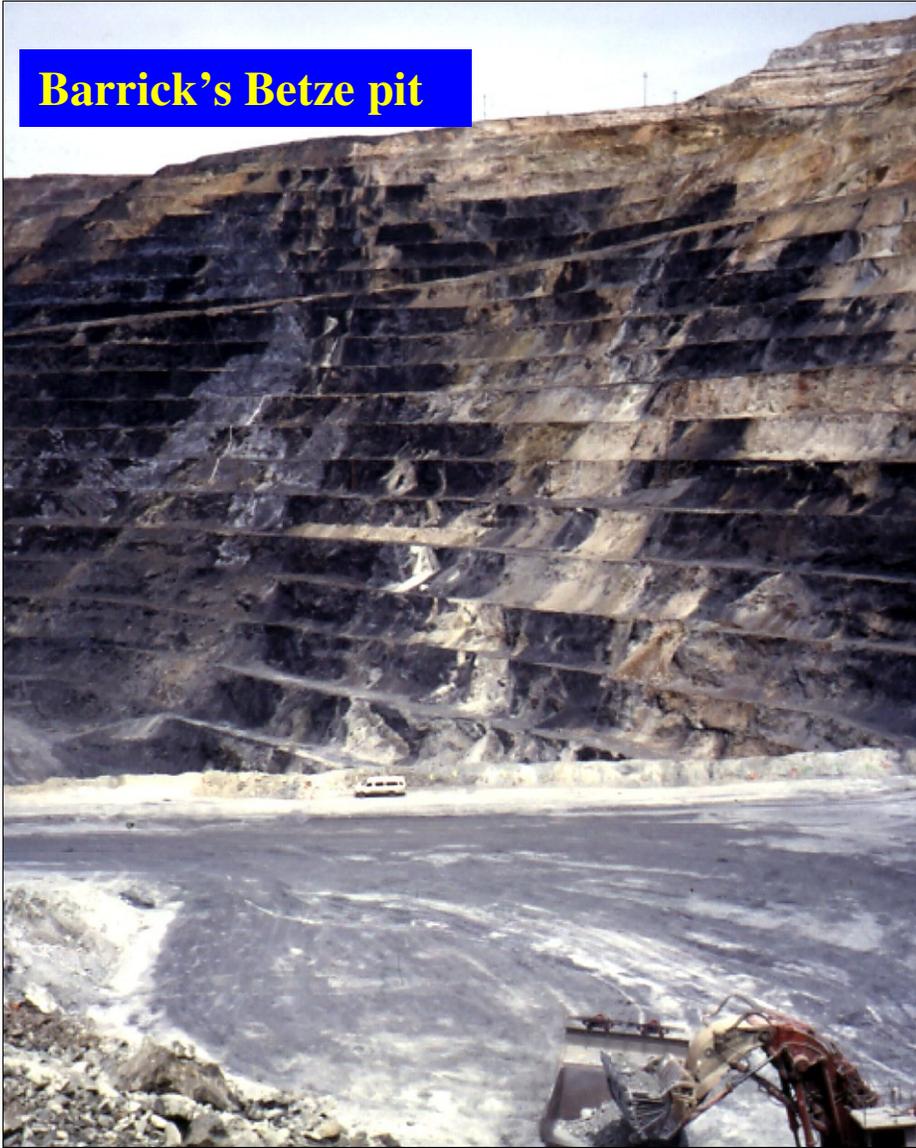


NEVADA VS. THE WORLD 2011

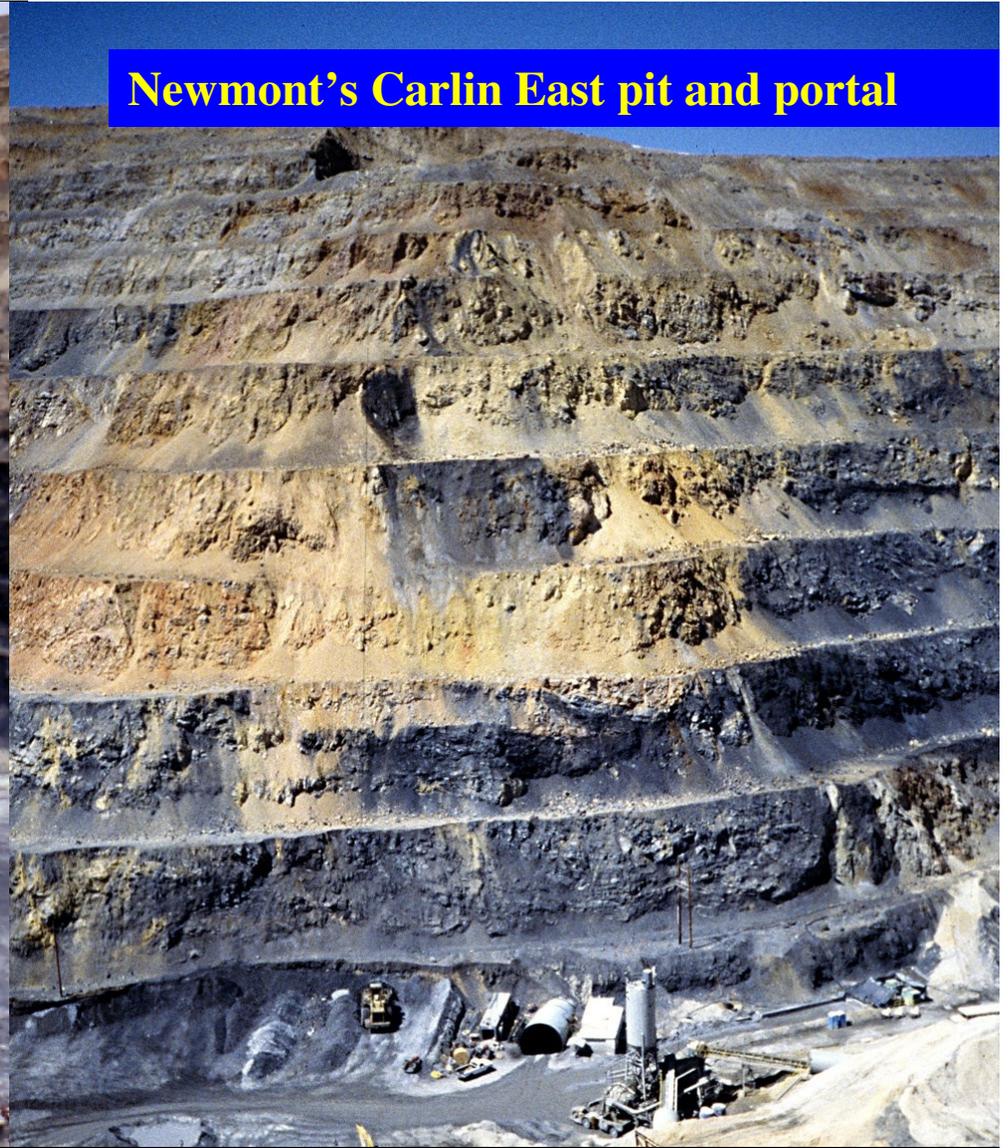
	Country	Gold Production (metric tons)
1	China	362
2	Australia	258
3	United States	234
4	Russia	200
5	South Africa	181
6	NEVADA	172
7	Peru	164
	WORLD	2,660

Data from USGS Mineral Commodity Summary 2013

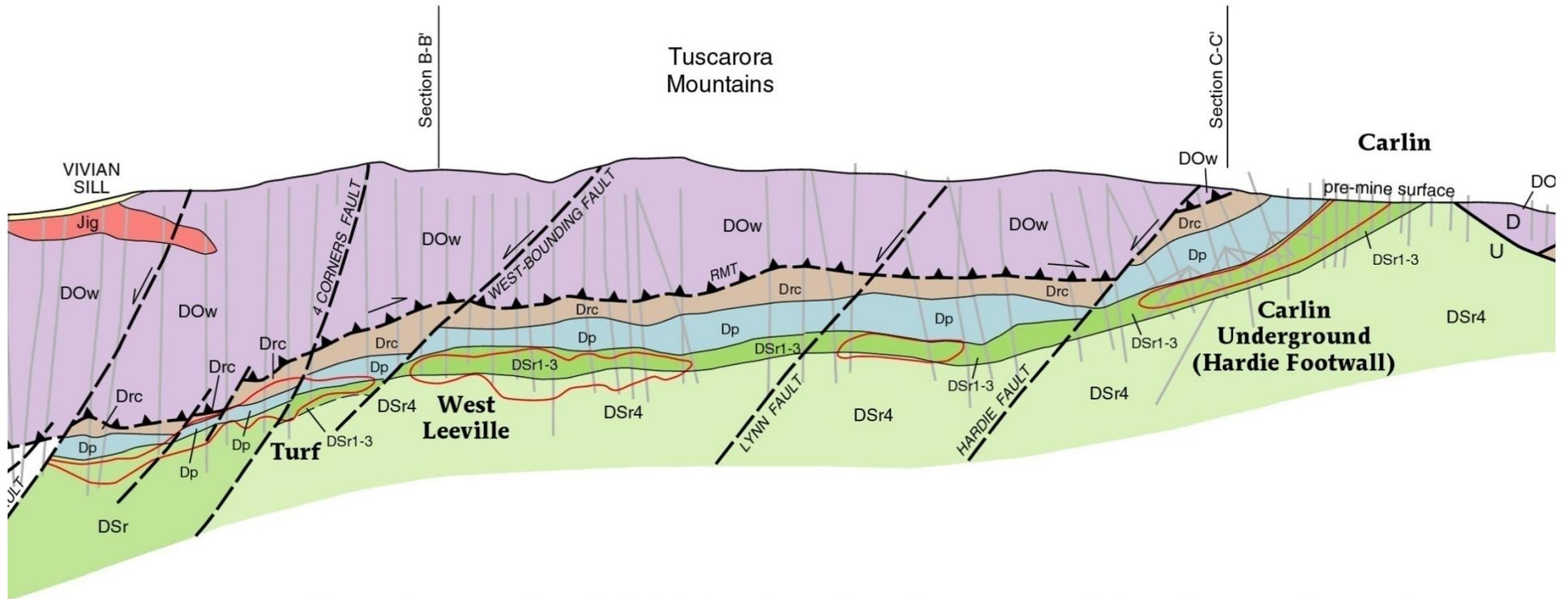
Barrick's Betze pit



Newmont's Carlin East pit and portal



**Global gold production in 2011 (2,660 metric tons) exceeded the cumulative production from the Carlin trend (2,436 tons).
The world mines the equivalent of a Carlin trend every year.**



By the end of 2011, the Carlin trend had produced a total of 78.3 million ounces of gold (2,436 tonnes). If production levels hold, the trend will produce a cumulative amount of 100 million ounces by 2022.

Section by Steve Moore & others, Newmont, NBMG Bulletin 111 - *Gold Deposits of the Carlin Trend*, edited by Tommy Thompson, Lew Teal, and Dick Meeuwig (204 pages, with detailed geologic maps and sections – \$35 from www.nbmge.unr.edu)

**17 major gold operations
in Nevada in 2011**

**(11 with production
>100,000 ounces)**

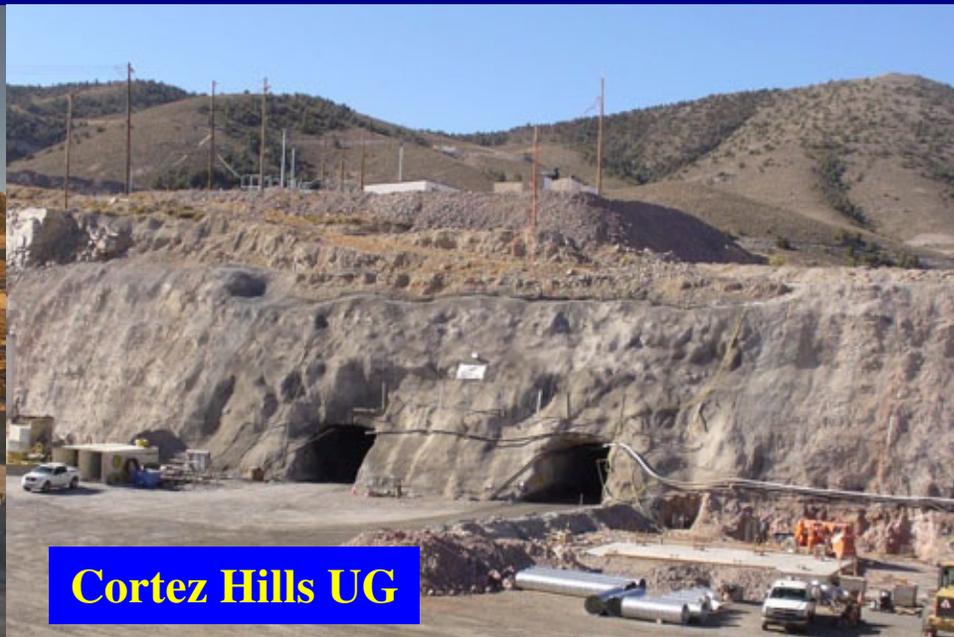
Major Mines, Oil Fields, and Geothermal Plants



NEVADA'S TOP GOLD PRODUCERS 2011

OPERATION	PRODUCTION (oz)
Barrick Cortez	1,421,039
Barrick Goldstrike	1,000,883
Newmont Carlin Operations	917,973
Newmont Twin Creeks	484,449
Barrick/Kinross Round Mountain	360,020
Newmont Phoenix	205,658
Barrick/Newmont Turquoise Ridge	178,283

BARRICK CORTEZ



**Barrick Cortez mined
1,421,039 oz Au in 2011
(1,119,910 OP and 301,129 UG)
Cortez property reserve is
14.488 M oz at 0.047 oz/ton
(proven and probable)**



BARRICK GOLDSTRIKE



Meikle



Betze-Post

Gold	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Betze-Post	721,534 oz	30.0 M oz	9,342,000 oz	0.096 oz/ton
Meikle	279,349 oz	8.5 M oz	3,035,000 oz	0.255 oz/ton
Total	1,000,883 oz	38.5 M oz	12,377,000 oz	0.113 oz/ton

NEWMONT CARLIN OPERATIONS



Gold Quarry



Leeville

Gold	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Open Pits	? oz	? M oz	12,620,000 oz	0.038 oz/ton
Underground	? oz	? M oz	5,090,000 oz	0.282 oz/ton
Total	917,973 oz	43,714,34 oz	17,710,000 oz	0.051 oz/ton

NEWMONT TWIN CREEKS



Gold	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Open Pit	484,449 oz	11,766,443 oz	3,780,000 oz	0.078 oz/ton

BARRICK/KINROSS ROUND MOUNTAIN

50%

50%



	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Gold Open Pit	360,020 oz	13.5 M oz	2,822,000 oz	0.017 oz/ton

NEWMONT PHOENIX



Gold	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Open Pit	205,658 oz	1,062,498 oz	7,250,000 oz	0.016 oz/ton

BARRICK/NEWMONT TURQUOISE RIDGE

75%

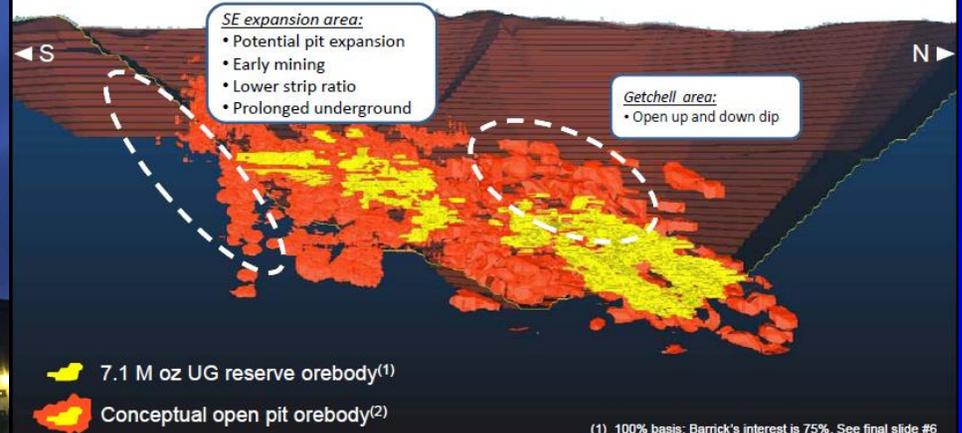
25%



Turquoise Ridge- Open Pit Evaluation



- Confirming OP expansion target in southeast
- In-fill drilling upgrading and adding resources and inventory
- New high-grade UG zones, open up-dip



(1) 100% basis; Barrick's interest is 75%. See final slide #6
 (2) See final slide #13

Gold	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Underground	178,283 oz	1,541,392 oz	7,059,000 oz	0.442 oz/ton

TOP UNDERGROUND GOLD PRODUCERS



Barrick's Cortez Hills Underground surpassed Barrick Goldstrike's Meikle as the top underground gold producer in 2011

Cortez Hills
301,129 oz

Meikle
279,349 oz

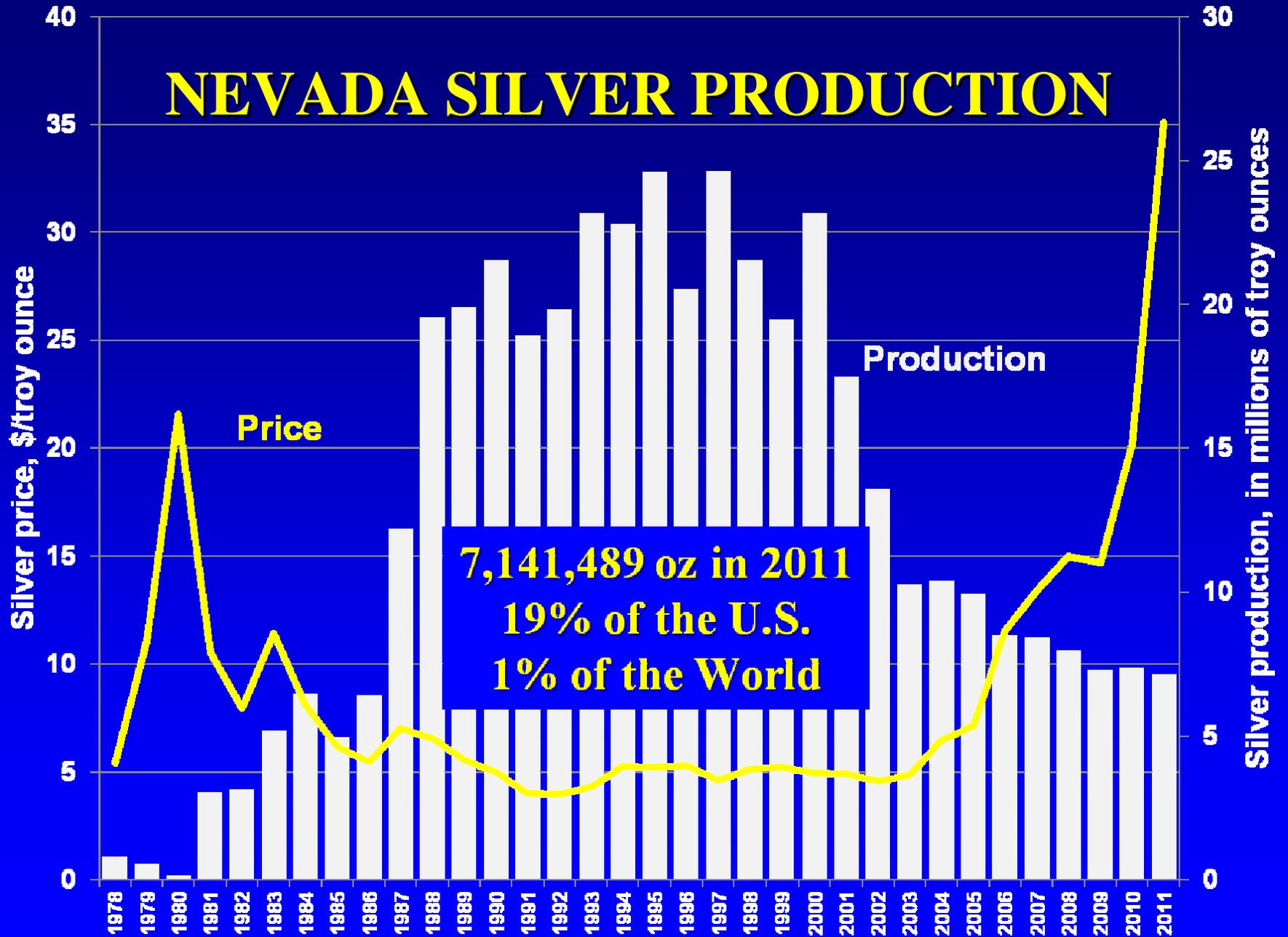
OTHER NEVADA GOLD PRODUCERS 2011

OPERATION	PRODUCTION (oz)
Goldcorp/Barrick Marigold	153,471
Barrick Homestake Ruby Hill	127,089
Newmont Midas	111,476
Allied Nevada Hycroft	104,002
Barrick Bald Mountain	92,818
Rodeo Creek Hollister	86,518
Barrick Goldstrike Storm	86,508
Jipangu Florida Canyon/Standard	41,161
KGHM International Robinson	31,969
Rawhide Mining Denton-Rawhide	24,828

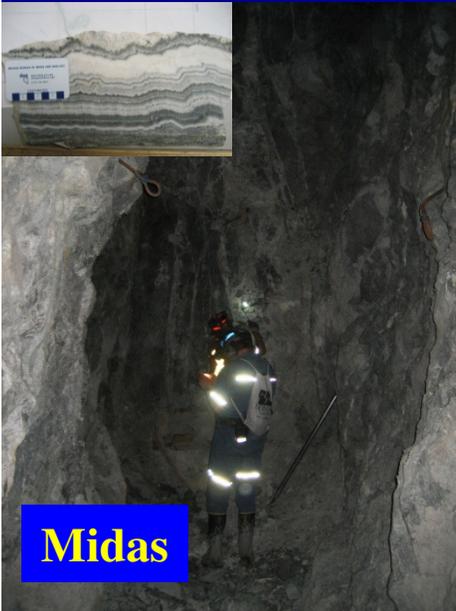


"Forget gold. Strategic metals are where it's at."

NEVADA SILVER PRODUCTION



NEVADA'S TOP SILVER PRODUCERS 2011



Midas



Rochester

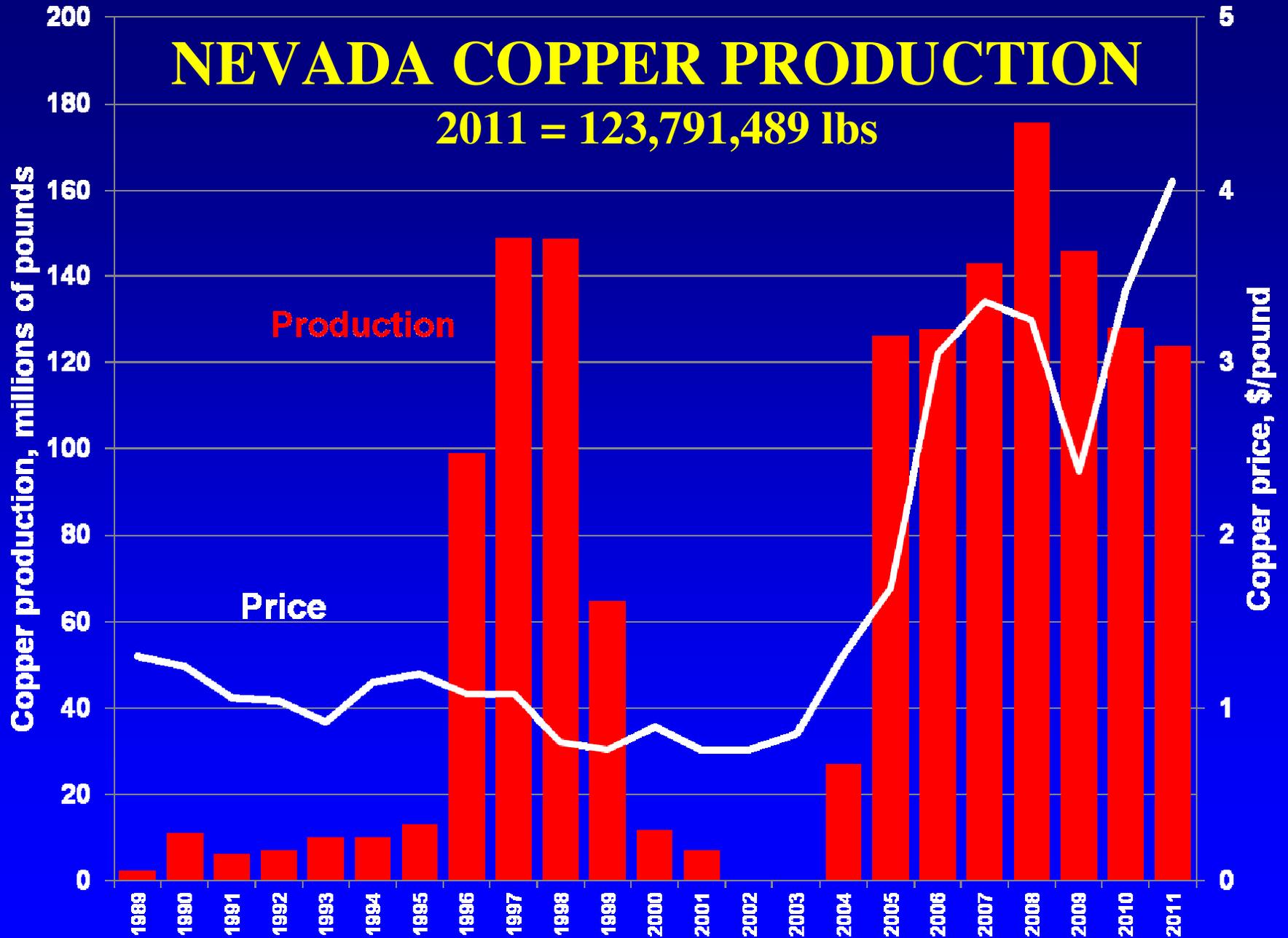


Phoenix

Silver	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
Newmont Midas	1,512,287 oz	19,619,277 oz	5.3 M oz	7.201 oz/ton
Coeur Rochester	1,392,433 oz	133,795,827 oz	29.6 M oz	0.630 oz/ton
Newmont Phoenix	1,152,312 oz	5,036,330 oz	110.0 M oz	0.244 oz/ton

NEVADA COPPER PRODUCTION

2011 = 123,791,489 lbs



NEVADA'S COPPER PRODUCERS 2011



Robinson



Phoenix

Copper	2011 Production	Cumulative Production	Reserve (P&P)	Reserve Grade
KGHM Robinson	99,893,372 lbs Cu	5.3 B lbs	4.728 B lbs	N/A
Newmont Phoenix	23,897,865 lbs Cu	99,537,082 lbs	1.640 B lbs	0.18%

OTHER NEVADA MINERAL PRODUCTION

- **Nevada led the nation in nonfuel mineral commodities by value – followed by AZ, MN, UT, AK, FL, CA, and TX**
- **Only producer in the U.S. of magnesite, lithium, and specialty clays sepiolite and saponite**
- **Led the U.S. in production of gold and barite**
- **Other commodities produced include: aggregate, lime, cement, silica sand, diatomite, gypsum, clays, molybdenum, perlite, iron ore, dimension stone, salt, semiprecious gemstones (turquoise and opal), and mercury**
- **Total value of the non-metallic minerals was \$188 M in 2011(excluding aggregates)**

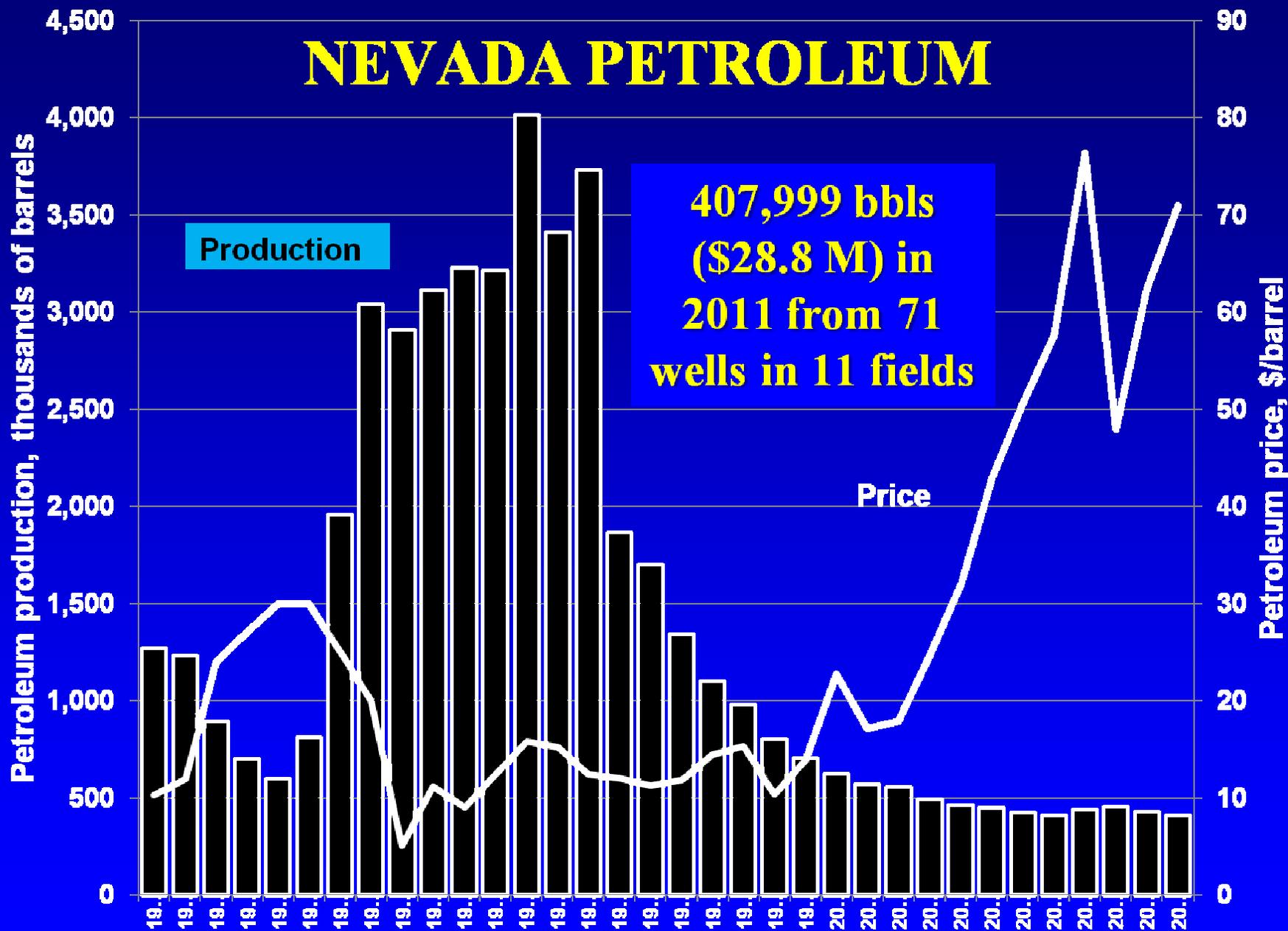
NEVADA MINING FINANCIAL ASSURANCE

(in millions)

	2003	2005	2007	2008	2009	2010	2011	2012	2013
Bonds	\$272	\$248	\$210.6	\$214.0	\$328.2	\$393.0	\$998.9	\$1,165.6	\$1,444.4
Letters of Credit		\$254	\$412.7	\$618.1	\$654.5	\$629.9	\$413.4	\$489.8	\$500.6
CD / Cash		\$4	\$4.7	\$9.3	\$3.9	\$6.1	\$7.0	\$11.7	\$12.9
Corp Guarantee	\$271	\$204	\$187.3	\$182.0	\$179.7	\$183.7	\$183.0	\$180.5	\$194.3
USFS	\$14	\$10	\$12.3	\$12.5	\$13.5	\$13.3	\$13.3	\$16.0	\$19.9
Bond Pool (NDOM)	\$1	\$1	\$2.3	\$2.7	\$4.1	\$4.0	\$4.3	\$5.3	\$3.5
Total	\$558	\$721	\$829.9	\$1,038.6	\$1,184.0	\$1,230.0	\$1,619.9	\$1,868.9	\$2,175.6

NOTE: Data from the Nevada Division of Environmental Protection

NEVADA PETROLEUM



PETROLEUM EXPLORATION



Railroad Valley

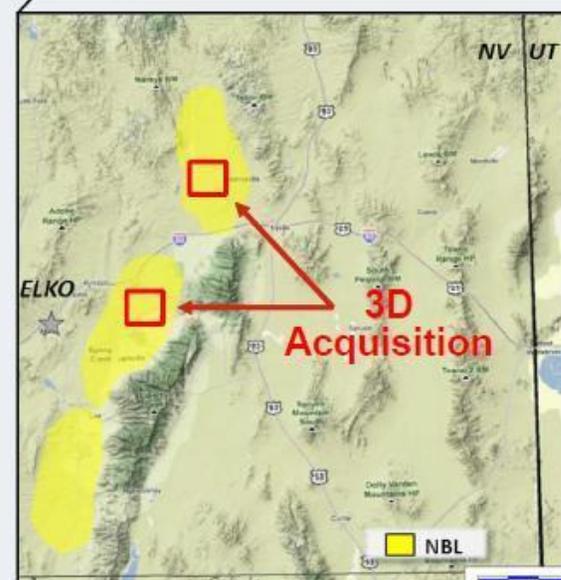
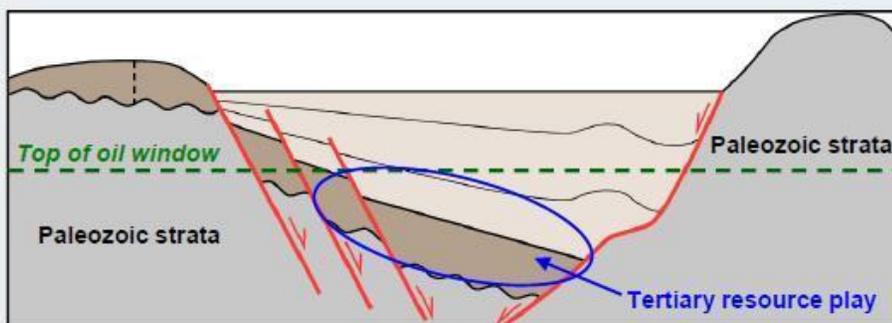
	2007	2008	2009	2010	2011	2012
Wells permitted	14	12	3	4	5	14
Wells drilled	7	7	4	2	4	9

NOBLE ENERGY

Elko County, N.E. Nevada

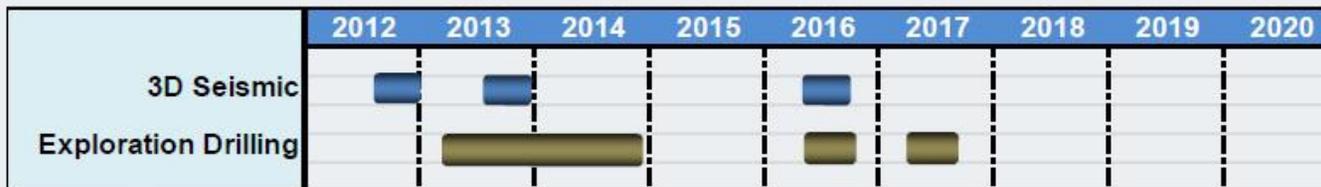
Next growth possibility in U.S.

- ▶ **Tight Oil Play with Core Area Scale**
- ▶ **350,000 Net Acres Located in Elko County, N.E. Nevada**
- ▶ **Phased Pilot Test Program to Determine Viability**
 - ▲ 5 – 8 vertical wells in 2013
 - ▲ Production results in less than 12 months
- ▶ **Favorable Full-Cycle Economics**
- ▶ **Two 3D Surveys Completed to Date**



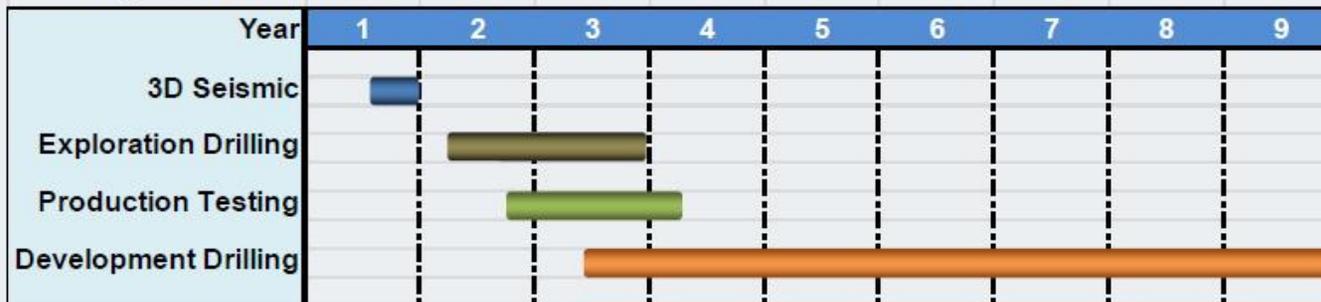
NOBLE ENERGY

Elko County, N.E. Nevada Exploration Plan *Success case*



Gross \$130 MM Exploration Investment over Four Years – Land, seismic, first 8 wells

Development Scenario



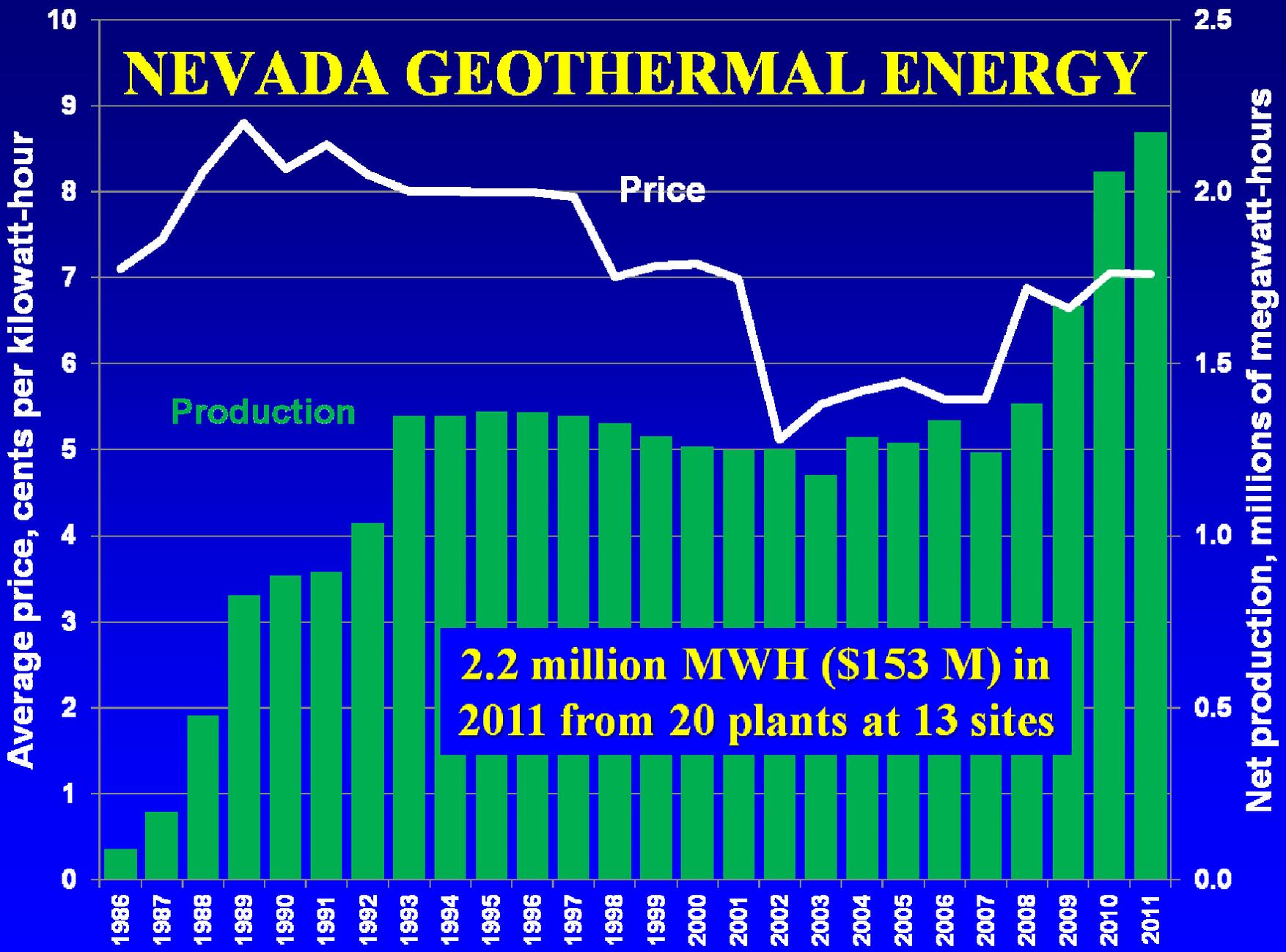
► Initial Production Late 2014

- ▲ Peak production 50 MBbl/d

► Success Metrics (full-cycle)

- ▲ 100% working interest
- ▲ \$13/BOE F&D
- ▲ BT ROR 35% – 45%, BT NPV10 \$5 – 8 B

NEVADA GEOTHERMAL ENERGY



2.2 million MWH (\$153 M) in 2011 from 20 plants at 13 sites

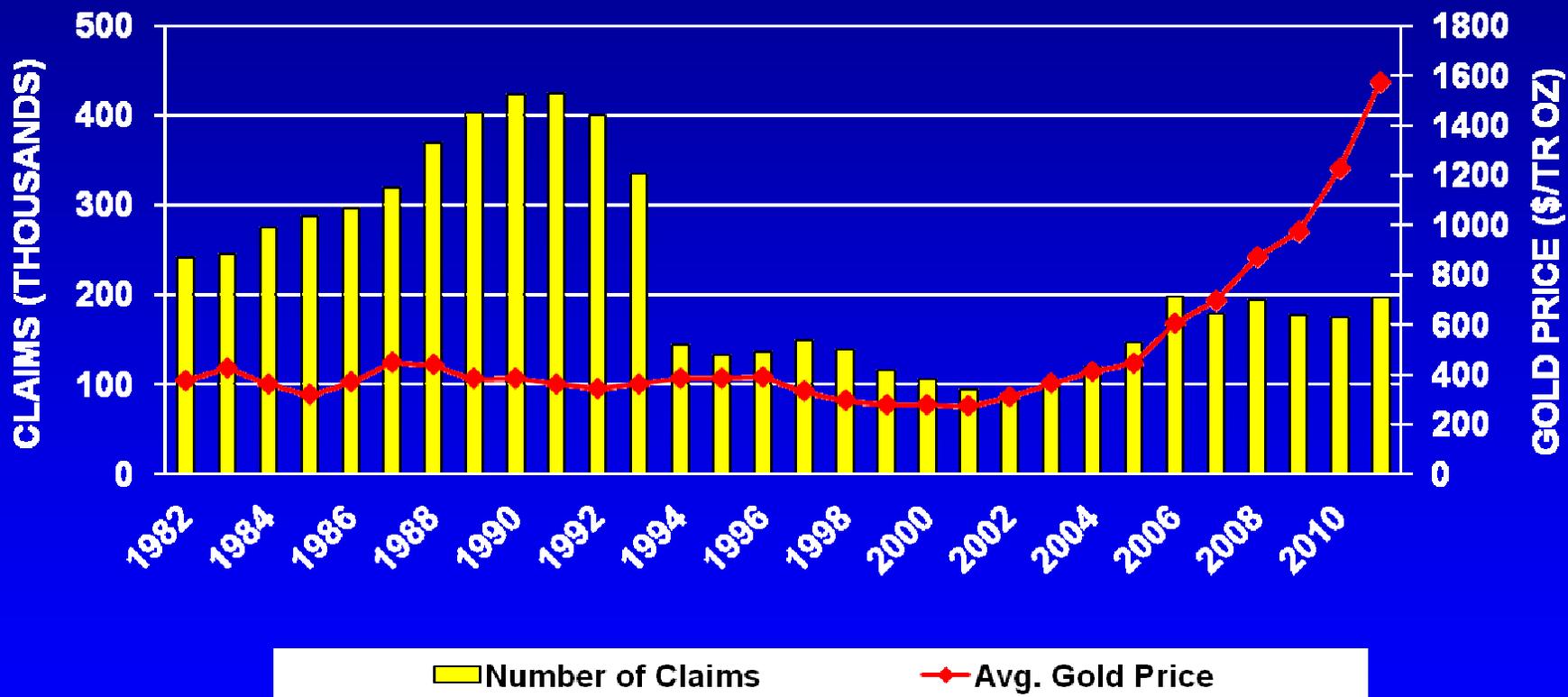
GEOHERMAL EXPLORATION



Patua Project near Hazen

	2007	2008	2009	2010	2011	2012
Wells permitted	59	116	195	119	85	51
Wells drilled	36	47	71	72	42	23

ACTIVE CLAIMS & GOLD PRICES 1982-2011



NOTE: Claim data from the BLM Public Land Statistics

NEVADA MINERAL AND ENERGY RESOURCE EXPLORATION SURVEY 2011

by

NEVADA DIVISION OF MINERALS

and

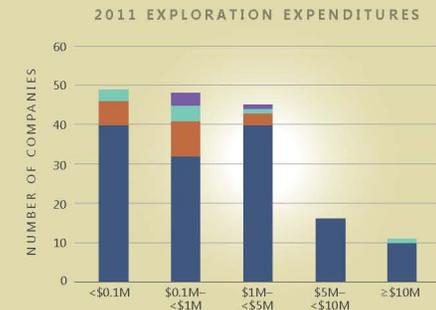
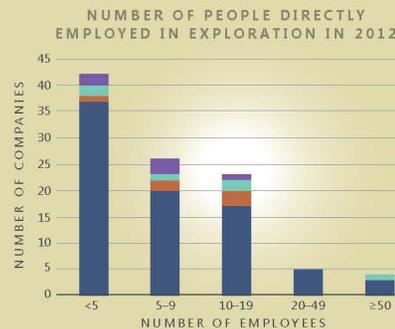
NEVADA BUREAU OF MINES AND GEOLOGY

2011 SURVEY OF NEVADA'S MINERAL AND ENERGY EXPLORATION INDUSTRY



- ▶ A minimum of \$675 million was spent on exploration in Nevada in 2011. Exploration for metals accounted for 90% of the expenditures.
- ▶ 13 companies spent \geq \$10 million for 67% of the expenditures.
- ▶ 84% of the companies had exploration budgets of $<$ \$5 million.
- ▶ Projected expenditures for 2012 are equal with or slightly higher than 2011.
- ▶ 1,040 people were directly employed by companies exploring in Nevada in 2011.
- ▶ The number of employees in 2012 is projected to increase by 9.5%.
- ▶ Actual exploration (mainly drilling) accounted for 69% of the expenditures, whereas 13% was spent on corporate overhead, 9% on permitting, and 8% on land holding costs.
- ▶ About 67% of expenditures was on exploration aimed at expanding known resources and 33% was spent on grassroots exploration aimed at discovering new resources.
- ▶ Nevada's favorable geology and access to public lands are the most important factors that attract companies to explore in Nevada.
- ▶ The time and cost of permitting are the most negative impacting factors.

The Nevada Division of Minerals funded the Nevada Bureau of Mines and Geology to survey 262 companies exploring for metals (mainly gold), industrial minerals, geothermal energy, and oil and gas. Of those companies 113 completed the survey. Expenditure amounts, based on data for 185 companies, were derived from a combination of survey responses and Internet research. Amounts of expenditures and number of employees are minimum estimates. The results of the survey are published in *Nevada Mineral and Energy Resource Exploration Survey 2011*, available from the Nevada Bureau of Mines and Geology at www.nbmng.unr.edu.



■ OIL & GAS
 ■ GEOTHERMAL
 ■ INDUSTRIAL MINERALS
 ■ METALS



University of Nevada, Reno



Nevada Commission on Mineral Resources
Division of Minerals



Nevada Land Withdrawals from Mineral Entry A Historical Perspective

Dennis Bryan
Nevada Commission
on Mineral Resources
(Senior VP of Development
Western Lithium Corporation)

&

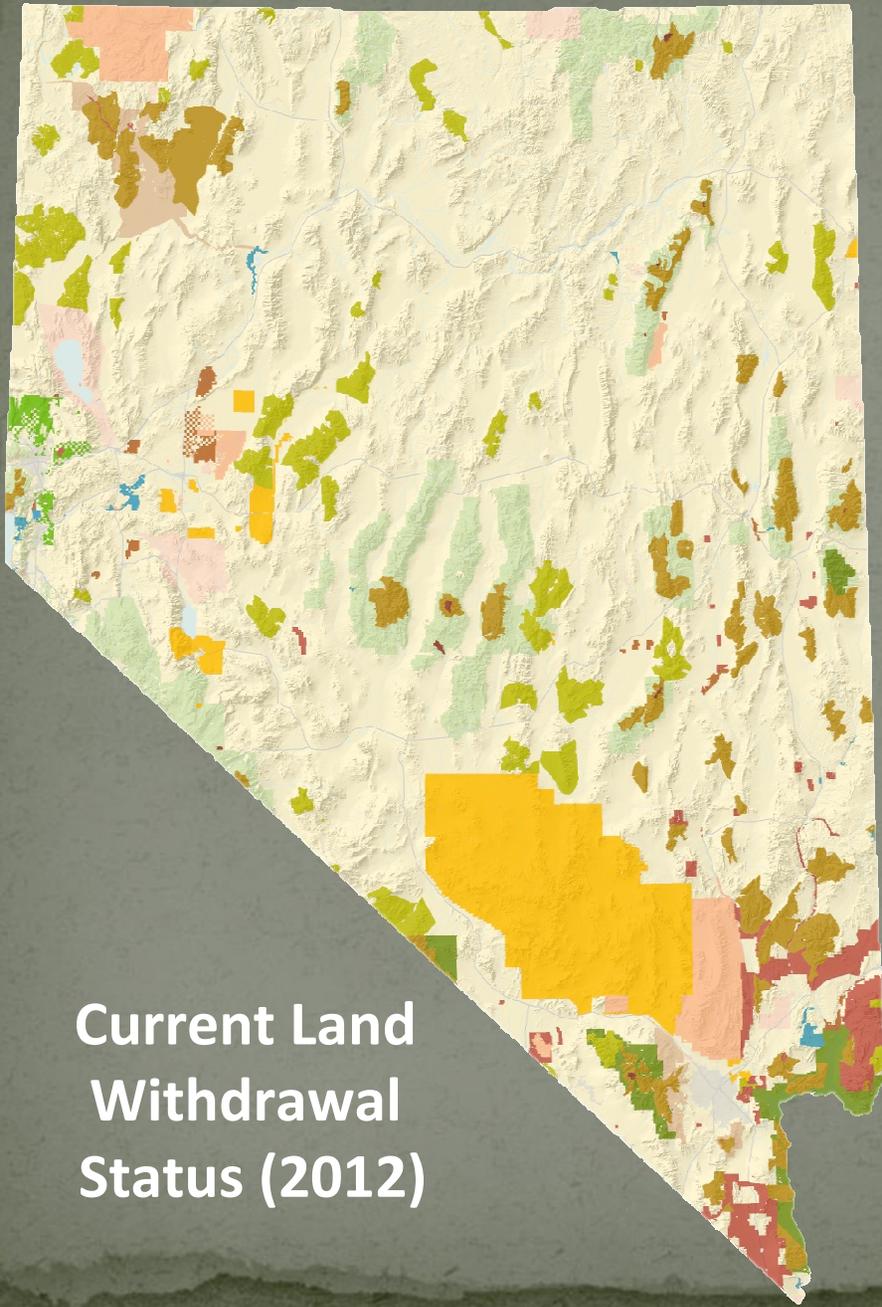
Alan Coyner
Administrator
Nevada Division
of Minerals

Presentation at:
Northwest Mining Association's
118th Annual Meeting
December 5, 2012

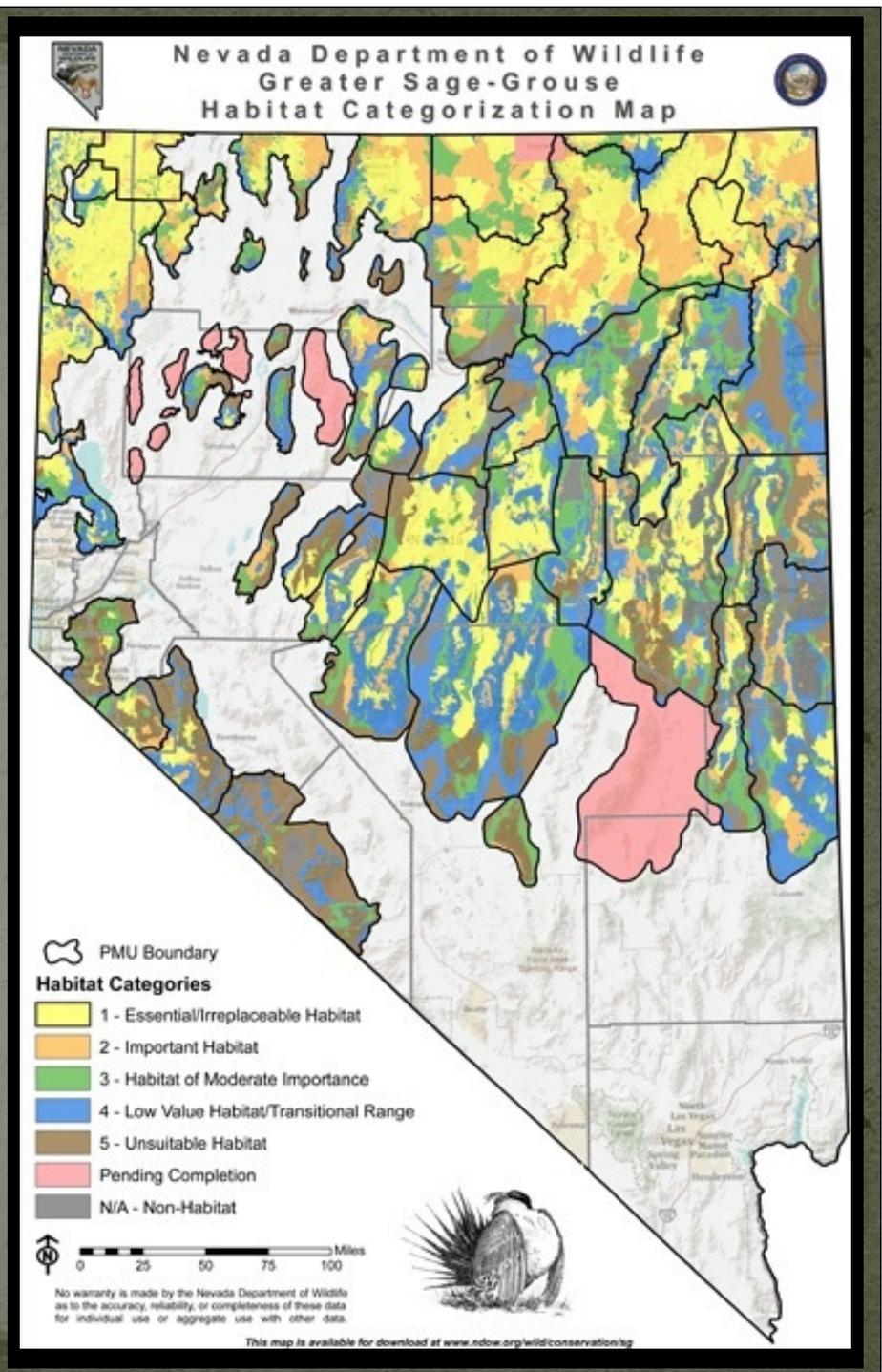
Modified from original study in 2011 by:
S. Bassett, I. Morrison, and K. Berry
Department of Geography
Mackay School of Earth Sciences and
Engineering, College of Science
University of Nevada, Reno

NEVADA
University of Nevada, Reno

Nevada Commission on Mineral Resources
Division of Minerals



Current Land
Withdrawal
Status (2012)



NEVADA LEGISLATIVE ISSUES

- **S.J.R. 15**

- Proposes to amend the Nevada Constitution to remove the separate tax rate and manner of assessing and distributing the tax on mines and the proceeds of mines.
- “It is the opinion of this office that if S.J.R. 15 becomes effective, patented and unpatented mines and mining claims will have to be assessed and taxed as other real property is assessed and taxed pursuant to the property tax in NRS Chapter 361.”

Kevin C. Powers

Chief Litigation Counsel

Legislative Counsel Bureau

NEVADA LEGISLATIVE ISSUES

- **S.B. 400 and S.B. 401**
 - Revises certain provisions governing taxes imposed on mines and mining claims (contingent upon the approval of S.J.R. 15, 400 makes claims taxable, 401 does not)
- **A.B. 346**
 - Revises provisions governing mining reclamation including a provision for the reclamation of a pit lake must provide for the reclamation for safe public access to and beneficial and recreational use of the pit lake
- **S.B. 390**
 - Requires a permit from NDEP to engage in hydraulic fracturing, also commonly known as “fracking”.

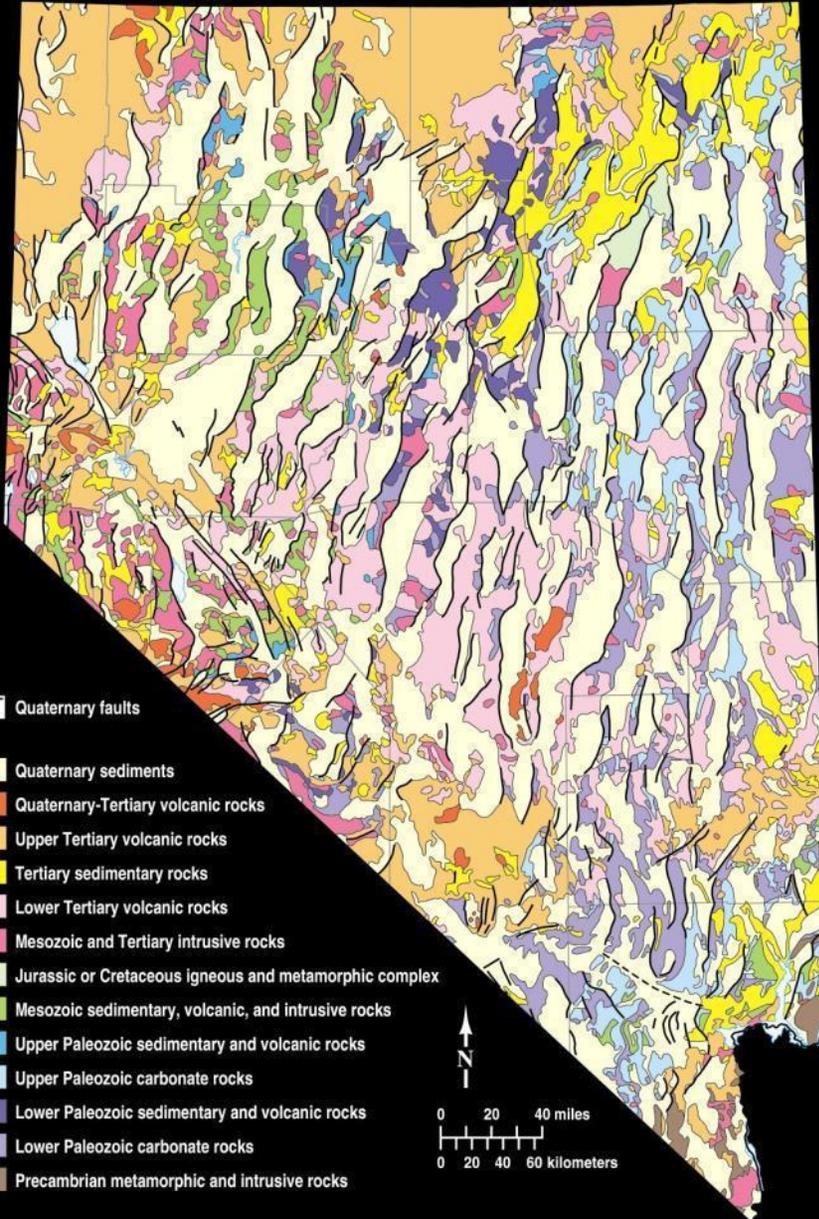
NEVADA'S TOP TEN EXPLORATION PROJECTS 2013



NEVADA'S TOP 10 PROJECTS - 2013

Gemfield	International Minerals	Au
Gibellini Hill	American Vanadium	V
Goldrush	Barrick	Au, Ag
Kings Valley	Western Lithium	Li
Long Canyon	Newmont	Au, Ag
Mt. Hope	General Moly	Mo
Pan	Midway Gold	Au
Pumpkin Hollow	Nevada Copper	Cu, Au, Fe
Spring Valley	Midway Gold	Au
Wilco	Rye Patch Gold	Au

Nevada Bureau of Mines and Geology



Generalized Geologic Map of Nevada

Ten Top Reasons to Explore in Nevada

1. Great geology and mineral potential
2. Many large producing mines, including high-grade, underground mines
3. Mines operated by leading international companies



- 4. Regulatory system with recent examples of timely permitting**
- 5. Good infrastructure (roads, drillers, hotels supplies, assayers, etc.)**
- 6. Large areas of public land open to exploration**
- 7. Dry climate and year round access**



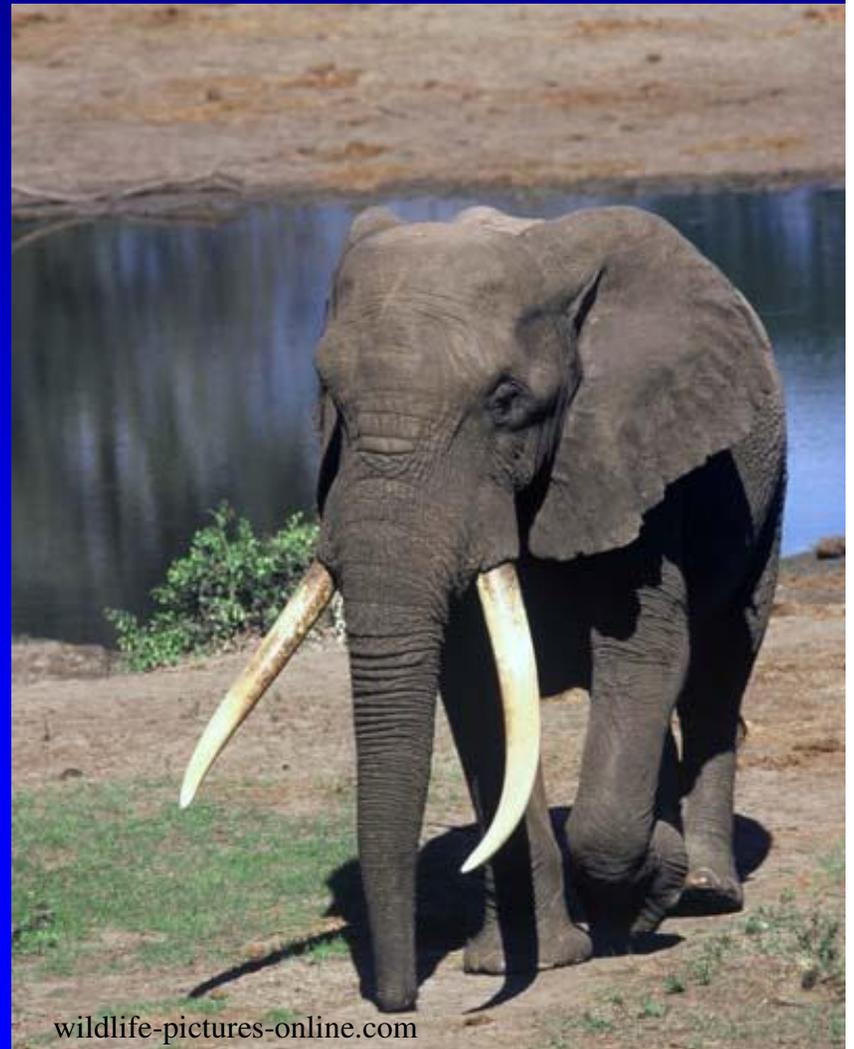
8. Network of knowledgeable exploration geologists, organizations, and agencies

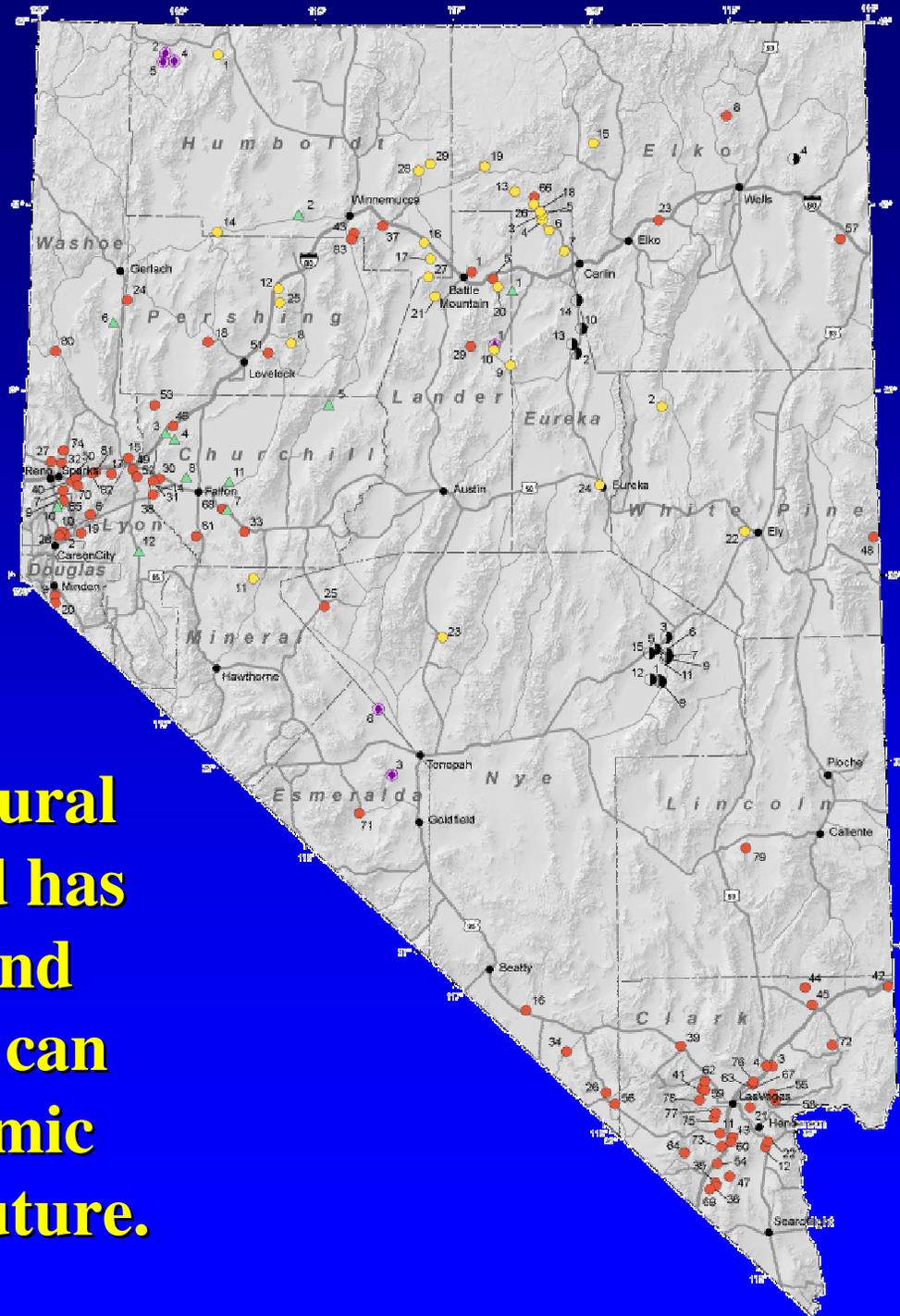
(Nevada Division of Minerals, Nevada Division of Environmental Protection, Geological Society of Nevada, Nevada Mining Association, Nevada Mineral Exploration Coalition,, Bureau of Mines & Geology, Ralph Roberts Center for Research in Economic Geology, and other units of the Mackay School of Earth Sciences and Engineering at UNR)

9. Recent discoveries and new mines

Ten Top Reasons to Explore in Nevada (continued)

10. No malaria,
black flies, moose,
polar bears, desert
death adders, or
crocodiles;
just elephants!





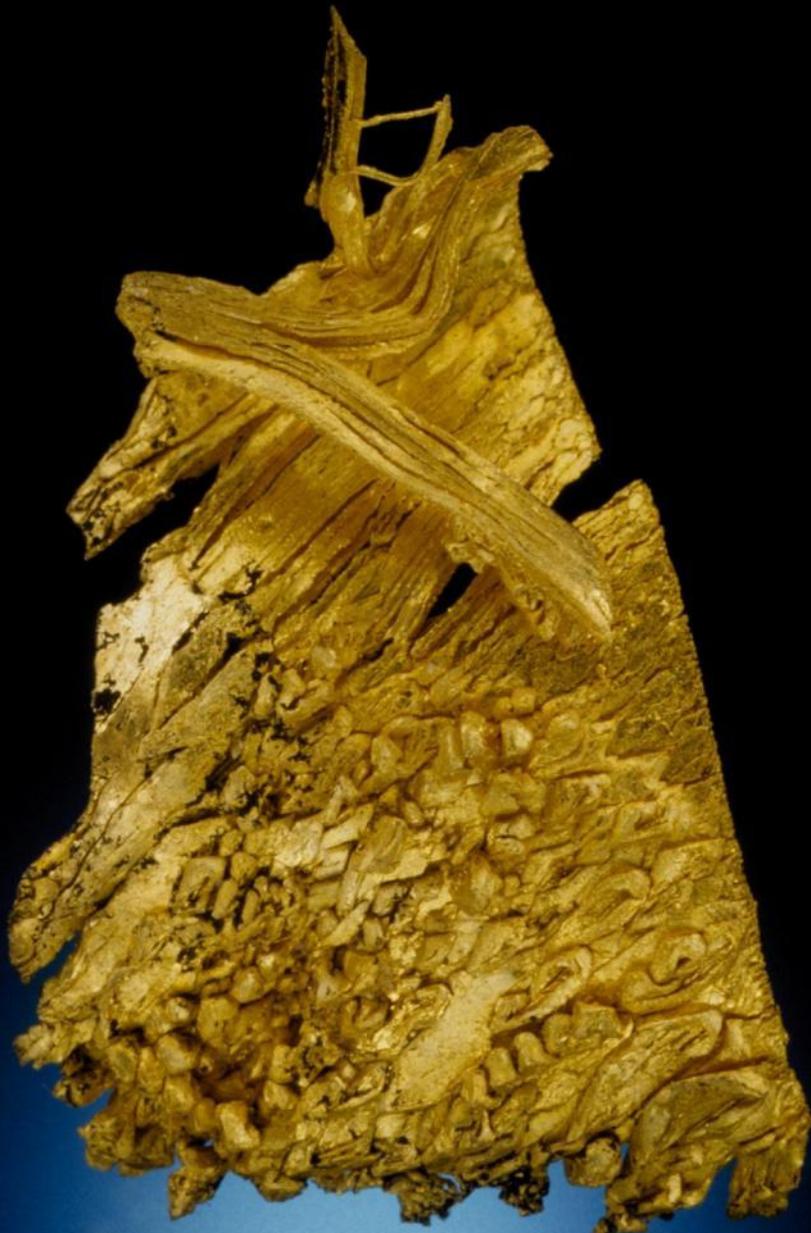
Nevada is a major natural resource producer and has significant mineral and energy resources that can provide strong economic development into the future.

**THANK
YOU!**



**Round Mountain
55 pounds (802 troy oz)
@\$1,616/oz =
\$1.296 million**

05/18/2006



Gold, Round Mountain

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Opal, Virgin Valley