

GLAMIS GOLD LTD  
Form 6-K  
August 04, 2006

**SECURITIES AND EXCHANGE COMMISSION**

**Washington, D.C. 20549**

**FORM 6-K**

**Report of Foreign Private Issuer  
Pursuant to Rule 13a-16 or 15d-16  
of the Securities Exchange Act of 1934**

For the month of August, 2006

Commission File Number 001-11648

**Glamis Gold Ltd.**

(Translation of registrant's name into English)

**5190 Neil Rd., Suite 310, Reno, Nevada 89502**

(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F

Form 40-F

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1):

**Note:** Regulation S-T Rule 101(b)(1) only permits the submission in paper of a Form 6-K if submitted solely to provide an attached annual report to security holders.

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7):

**Note:** Regulation S-T Rule 101(b)(7) only permits the submission in paper of a Form 6-K if submitted to furnish a report or other document that the registrant foreign private issuer must furnish and make public under the laws of the jurisdiction in which the registrant is incorporated, domiciled or legally organized (the registrant's home country), or under the rules of the home country exchange on which the registrant's securities are traded, as long as the report or other document is not a press release, is not required to be and has not been distributed to the registrant's security holders, and, if discussing a material event, has already been the subject of a Form 6-K submission or other Commission filing on EDGAR.

Indicate by check mark whether by furnishing the information contained in this Form, the registrant is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes

No

If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): 82-

\_\_\_\_\_

**Signatures**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

GLAMIS GOLD LTD.  
(Registrant)

Date: August 2, 2006

By: /s/ Cheryl A. Sedestrom  
Cheryl A. Sedestrom  
Chief Financial Officer

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GLAMIS GOLD LTD.  
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Volume I

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A Professional Qualifications  
 Certificate of Qualified Person and Consent of Author  
 Résumés of Principal Authors

Responsibility	Qualified Person	Registration	Company
Resource Modeling	James S. Voorhees	P.E.	Glamis
Mine Planning	James S. Voorhees	P.E.	Glamis
Reserves	James S. Voorhees	P.E.	Glamis
Geology	Charlie Ronkos	Corporate	Glamis
Metallurgical Testing	Jerry Hanks	P.E.	Independent
Flow Sheets	Tom Drielick	P.E.	M3 Engineering
Pit Geotechnical	Tom Wythes	P.E.	Golder Assoc.
Process Plant and Costing	Conrad Huss	P.E.	M3 Engineering
Foundation Design	Michael Pegnam	P.E.	Golder Assoc.
Tailings	Jim Johnson	P.E.	Golder Assoc.

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## **1 EXECUTIVE SUMMARY**

### **1.1 Title Page**

This report is prepared in accordance with the Canadian Standard NI 43-101. The first two items of this 26-item outline are the Title Page and Table of Contents. For ease of cross-referencing during review, the first two subsections of this report (1.1 and 1.2) are incorporated into the format for this report.

### **1.2 Table Of Contents**

See discussion in subsection 1.1.

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**1.3 Summary (Synopsis)**

## 1.3.1 Abstract of Base Case

The following metrics outline the polymetallic project into various gold equivalencies context. These metrics provide a reference framework for comparison to other Glamis Gold Ltd. (Glamis) properties. A more conventional polymetallic summary follows this abstract.

Mine life (years)		17		
Mill throughput (tonnes per day)		100,000(50,000 initial)		
Initial capital cost (\$US millions)	\$	882		
Sustaining capital (\$US millions)	\$	327		
Average Annual Payable Metal:				
Gold (troy ounces)		387,500		
Silver (troy ounces)		22,846,000		
Lead (tonnes)		71,125		
Zinc (tonnes)		137,400		
Total production as gold equivalent (troy ounces):		1,339,300(for scale comparison only)		
Unit operating costs:				
Mining cost per total tonne	\$	0.81		
Milling cost per ore tonne	\$	2.98		
G&A cost per ore tonne	\$	0.22		
Average total cash costs per unit (lead as by-product):				
Gold (per ounce)	\$	125		
Silver (per ounce)	\$	4.91		
Zinc (per pound)	\$	0.44		
Total cash cost per ounce gold production (utilizing all other metals as by-products)	\$	(378)		
Metals price assumptions:				
		Base case	Low Case	High Case
Gold (per ounce)		\$532.74	\$ 450	\$ 650
Silver (per ounce)	\$	8.84	\$ 7.00	\$10.00
Zinc (per pound)	\$	0.787	\$ 0.60	\$ 0.86
Lead (per pound)	\$	0.424	\$ 0.30	\$ 0.43
Project IRR (after tax)				
		18.7%	10.2%	23.4%
After Tax NPV 0% Discount (\$US millions)	\$	3,256	\$1,560	\$4,334
After Tax NPV 5% Discount (\$US millions)	\$	1,521	\$ 514	\$2,161
Payback (years)		5.6	7.6	4.8

The following page highlights information used to develop the preceding summary.

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**Abstract of Key Financials**

Life of Mine Total	2006	2007	2008	2009	2010	2011	2012	2013	2014
564,016			10,514	24,397	39,148	22,918	43,077	40,779	38,284
2,121,342			36,000	99,000	99,000	139,000	179,000	179,000	179,000
2.76			2.42	3.06	1.53	5.07	3.16	3.39	3.68
6,239			38	107	203	132	369	331	405
368,083			2,546	8,104	14,657	10,105	23,136	21,226	23,089
1,138				13	40	39	74	69	70
2,199				23	65	61	150	127	124
21,496			67	295	660	590	1,236	1,245	1,298
\$ 11,451,521		\$	35,545	\$ 173,183	\$ 384,513	\$ 312,209	\$ 728,533	\$ 650,063	\$ 701,639
\$ 5,772,843	\$	50	\$ 62,803	\$ 139,366	\$ 229,800	\$ 233,696	\$ 406,777	\$ 394,318	\$ 408,797
\$ 881,844	\$ 82,131	\$ 209,476	\$ 254,358	\$ 94,768	\$ 120,156	\$ 120,955			
\$ 327,438			\$	46,279	\$ 40,892	\$ 62,007	\$ 66,302	\$ 57,600	\$ 2
\$ 870,654									
\$ 3,256,200	\$ (82,131)	\$ (209,526)	\$ (256,775)	\$ (111,373)	\$ (49,833)	\$ (100,449)	\$ 171,454	\$ 210,145	\$ 281,840
	\$ (82,131)	\$ (291,657)	\$ (548,432)	\$ (659,805)	\$ (709,638)	\$ (810,087)	\$ (638,633)	\$ (428,489)	\$ (146,648)

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\$	0.81		\$	1.14	\$	0.65	\$	0.69	\$	0.69	\$	0.70	\$	0.74	\$	0.84
\$	2.98		\$	1.13	\$	1.67	\$	2.13	\$	2.88	\$	2.93	\$	3.03	\$	3.16
\$	0.22		\$	0.70	\$	0.30	\$	0.18	\$	0.31	\$	0.17	\$	0.18	\$	0.19
\$	125.41		\$	784	\$	318	\$	157	\$	219	\$	139	\$	163	\$	181
\$	4.91		\$	13.02	\$	7.37	\$	5.84	\$	7.92	\$	5.43	\$	5.98	\$	5.69
\$	0.44		\$	0.68	\$	0.52	\$	0.66	\$	0.49	\$	0.53	\$	0.51	\$	
\$	(377.90)		\$	1,165	\$	181	\$	(244)	\$	(14)	\$	(344)	\$	(239)	\$	(189)
	2016	2017	2018	2019	2020	2021	2022	2023	2024							
	36,753	36,500	36,500	38,584	39,806	42,884	40,645	29,216	7,239							
	179,000	179,000	179,000	162,300	97,200	74,800	95,024	58,047	7,971							
	3.87	3.90	3.90	3.21	1.44	0.74	1.34	0.99	0.10							
	677	640	687	464	629	554	357	49	24							
	25,433	23,302	26,167	27,342	28,766	33,950	30,976	33,719	8,819							
	79	77	84	98	107	101	75	110	20							
	156	152	179	193	225	251	155	153	46							

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1,724	1,672	1,817	1,741	1,976	2,097	1,606	1,337	512
\$ 929,338	\$ 883,564	\$ 985,000	\$ 914,495	\$ 1,079,929	\$ 1,123,178	\$ 801,463	\$ 697,083	\$ 189,003
\$ 440,192	\$ 444,069	\$ 449,995	\$ 451,731	\$ 438,752	\$ 431,090	\$ 374,493	\$ 342,900	\$ 89,593
\$ 26,758	\$ 11,755	\$ 3,695	\$ 9,160					
\$ 129,618	\$ 170,247	\$ 191,205	\$ 134,031	\$ 103,371	\$ 50,515	\$ 3,816		
\$ 320,621	\$ 313,627	\$ 369,432	\$ 337,987	\$ 438,930	\$ 491,883	\$ 357,939	\$ 271,811	\$ 164,695
\$ 481,084	\$ 794,711	\$ 1,164,143	\$ 1,502,129	\$ 1,941,059	\$ 2,432,942	\$ 2,790,881	\$ 3,062,692	\$ 3,227,387
\$ 0.85	\$ 0.90	\$ 0.81	\$ 0.79	\$ 0.89	\$ 0.80	\$ 0.93	\$ 1.09	\$ 1.17
\$ 3.24	\$ 3.24	\$ 3.24	\$ 3.14	\$ 3.08	\$ 2.94	\$ 3.05	\$ 3.82	\$ 4.04
\$ 0.20	\$ 0.20	\$ 0.20	\$ 0.19	\$ 0.18	\$ 0.17	\$ 0.18	\$ 0.25	\$ 0.99
\$ 166	\$ 179	\$ 151	\$ 93	\$ 80	\$ 53	\$ 75	\$ (1,769)	\$ (506)
\$ 4.54	\$ 4.84	\$ 4.38	\$ 4.85	\$ 3.95	\$ 3.69	\$ 4.53	\$ 5.13	\$ 4.66
\$ 0.41	\$ 0.43	\$ 0.39	\$ 0.43	\$ 0.35	\$ 0.33	\$ 0.40	\$ 0.45	\$ 0.41
\$ (190)	\$ (153)	\$ (246)	\$ (467)	\$ (487)	\$ (718)	\$ (666)	\$ (6,651)	\$ (3,600)

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1.3.2 Scope

This feasibility study has been prepared by M3 Engineering & Technology Corporation (M3) to: a) summarize the work performed to date on the Glamis Minera Peñasquito project, and b) evaluate the economics of the plant operating at 100,000 MTPD versus the previously envisioned 50,000 MTPD. The ore body is polymetallic with the precious metals of silver and gold providing over one-half the revenue and the base metals of lead and zinc providing the remainder. The study sets forth conclusions and recommendations, based on M3's experience and professional opinion, which result from their analysis of work and data collected. Glamis has provided all information for the resource model and mining, as well as reviewing and determining more conservative metallurgical recovery rates than established in prior studies. M3 concurs with this approach.

Minera Peñasquito, S.A. de C.V. is a wholly owned subsidiary of Glamis Gold Ltd. (Glamis). The project is located in the state of Zacatecas, Mexico.

1.3.3 Base Case Definition

The financials for this project are based on the following:

Oxide plant in full production July 1, 2008. (Initially 30,000 MTPD run-of-mine, peaking at 50,000 MTPD, and averaging 25,000 MTPD for the first seven years; thereafter, only a nominal amount.)

Sulphide SAG Line 1 start up July 1, 2009, with two-thirds production (33,300 MTPD) for the last six months of 2009. Thereafter, SAG Line 1 will operate at 50,000 MTPD.

Sulphide SAG Line 2 starts up October 1, 2011, with full production of 50,000 MTPD starting January 1, 2012. Thereafter, between SAG Lines 1 and 2, the sulphide plant will operate at 100,000 MTPD.

Metal pricing for determining resources are as follows:

Gold	\$650.00/ounce
Silver	\$10.00/ounce
Zinc	\$0.86/pound
Lead	\$0.43/pound

Metals pricing for determining reserves approximates a 36 month historical average, i.e., the geometry for the pit and ore blocks within the geometry were based on the following:

Gold	\$450.00/ounce
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Silver \$7.00/ounce

Zinc \$0.60/pound

Lead \$0.30/pound

Metals pricing for the financial model is based on a 60/40 blend of three years historical and two years future, i.e., the following were applied to the geometry as determined above:

Gold \$532.74/ounce

Silver \$8.84/ounce

Zinc \$0.787/pound

Lead \$0.424/pound

Unless otherwise stated, metals revenue and associated metrics (unit costs, average annual payable metal, etc.) are based on payable units after smelter deductions.

1.3.4 Capital Cost Estimate Cases

As part of this effort, M3 has developed process plant capital cost estimates for the following main two cases.

Case 100,000 MTPD plant July 2006 costing.

1:

This is the Base Case for this report.

Case 50,000 MTPD plant modifiable to 100,000 MTPD July 2006 costing.

2:

Owner's costs have been outlined by Glamis and are included.

1.3.5 Mining Reserves Metrics

The following life-of-mine tonnages have been identified

Oxide Ore 87,000,000 tonnes

Sulphide Ore 477,000,000 tonnes

Waste 1,557,000,000 tonnes

Total 2,121,000,000 tonnes

1.3.6 Resources

Measured and Indicated Resources 872,500,000 tonnes

Inferred Resources 2,576,600,000 tonnes

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1.3.7 Metallurgical Recoveries for Sulphide Ores

	Lead Concentrate			Zinc Concentrate		
	Breccia	Intrusive	Sedimentary	Breccia	Intrusive	Sedimentary
<b>Peñasco Mill Recoveries</b>						
Lead	75.0%	72.0%	60.0%	0.0%	0.0%	0.0%
Zinc	0.0%	0.0%	0.0%	78.0%	60.0%	50.0%
Silver	65.0%	63.0%	40.0%	16.0%	16.0%	10.0%
Gold	66.0%	65.0%	25.0%	14.0%	12.0%	10.0%
Concentrate Grade	52.0%	51.0%	45.0%	50.0%	50.0%	50.0%
<b>Chile Colorado Mill Recoveries</b>						
Lead			63.0%			0.0%
Zinc			0.0%			60.0%
Silver			58.0%			13.0%
Gold			20.0%			7.0%
Concentrate Grade			50.0%			55.0%

Composition of Sulphide Ore in Peñasco:

Breccia	77%
Intrusives	10%
Sedimentary	13%

1.3.8 Oxide Recoveries

	Gold	Silver
Peñasco	50%	28%
Chile Colorado	50%	22%

1.3.9 Ore Grades

Oxide Ore:

Gold	0.28 grams/tonne
Silver	23.8 grams/tonne

Sulphide Ore:

Gold	0.60 grams/tonne
Silver	33.2 grams/tonne
Lead	0.35 %
Zinc	0.76 %

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1.3.10 Capital Cost Estimate Summaries

The total project capital cost for the base case is estimated as follows:

**CAPITAL COST ESTIMATE SUMMARY 100,000 MTPD**

	<b>Initial</b>	<b>Sustaining</b>
Camp and Roads	\$ 25 million	
Mine Equipment	\$131 million	\$327 million
Pre-Stripping	\$ 55 million	
Power Setup	\$ 48 million	
SAG Line #1 and Infrastructure	\$270 million	
Tailing Dam and Reclaim	\$ 28 million	
Merrill-Crowe Plant and Pad	\$ 26 million	
SAG Line #2	\$217 million	
Port	\$ 28 million	
Owner's Costs	\$ 54 million	
	<b>\$882 million</b>	<b>\$327 million</b>

**CAPITAL COST ESTIMATE SUMMARY 50,000 MTPD**

Camp and Roads	\$ 25 million	
Mine Equipment	\$ 84 million	\$312 million
Pre-Stripping	\$ 55 million	
Power Setup	\$ 48 million	
SAG Line #1 and Infrastructure	\$270 million	
Tailing Dam and Reclaim	\$ 28 million	
Merrill-Crowe Plant and Pad	\$ 26 million	
Port	\$ 28 million	
Owner's Costs	\$ 44 million	
	<b>\$608 million</b>	<b>\$312 million</b>

1.3.11 Operating Cost Estimate

The following life-of-mine costs are anticipated where ore is defined as the combination of oxide and sulphide ore:

Mining Costs	=	\$3.05/tonne ore
Sulphide Process Costs	=	2.80/tonne ore
Oxide Process Costs	=	0.18/tonne ore
G&A Costs	=	0.22/tonne ore
Lead Concentrate Shipping and Smelting	=	1.13/tonne ore
Zinc Concentrate Shipping and Smelting	=	2.50/tonne ore
Doré Shipping and Refining	=	0.02/tonne ore
<b>Total</b>		<b>\$9.90/tonne ore</b>

The above listing indicates the significance of shipping and smelter charges.



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The following indicates costing on a different per unit basis:

Chile Colorado Process Costs	=	\$3.81/tonne CC sulphide ore
Peñasco Process Costs	=	\$3.24/tonne PN sulphide ore
Mine Costs	=	\$0.81/tonne mined
Heap Leach Process Costs	=	\$1.18/tonne of oxide ore
1.3.12 Schedule		

Engineering and procurement activities began immediately following issuance of the November 2005 Feasibility Study. Starting in the second quarter 2006, critical purchase orders were placed for major, schedule critical process equipment. Mine equipment has not yet been ordered.

Preconstruction activities including roads, camps, and air strip will occur during the last two quarters of 2006 and the first quarter of 2007.

Permits, surface rights negotiations, and financing are assumed to be in place by the first quarter of 2007, leading to full release of the project (NTP). At this time all purchase orders will be released for full fabrication and delivery.

Mobilization to the field for the process facilities will commence at NTP and early field work will be comprised of stripping, roads, leach pad, ponds, power supply and the Merrill-Crowe plant.

*Schedule on Which Financials Are Based*

Mobile mine equipment (e.g., shovels and trucks) will arrive for assembly in the 4th quarter of 2007. Stripping of mine overburden will begin in the first quarter of 2008. Placement of crushed overliner material will commence in the second quarter of 2008 and continue throughout 2009.

The Merrill-Crowe plant will be completed by the second quarter of 2008 leading to full doré production in the last half of 2008.

The sulphide concentrator (SAG Line No. 1) pre-operational testing will be completed at the end of June 2009. Mill start up and commissioning will commence in July 2009, with ramp up through the remainder of 2009.

SAG Line No. 2 will be engineered in 2009 and built in 2010/2011. Start up begins October 1, 2011. Full production starts January 1, 2012.

Figure 1-16 is the Project Development Summary Schedule.

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1.3.13 Financial Model Metrics and Sensitivities

Metrics for Base Case

IRR	=	18.7% after Mexican income taxes
NPV (at 0% discount rate)	=	\$3,256,200,000
NPV (at 5% discount rate)	=	\$1,521,378,000
Payback	=	5.6 years

Revenue:	Gold	=	28%
	Silver	=	28%
	Lead	=	9%
	Zinc	=	35%

		=	100%
NSR (Life-of-Mine)		=	\$18.95 / tonne of ore
Gross Margin		=	\$9.05 / tonne of ore

1.3.14 Sensitivities

See Figure 1-20 for a graphical representation of the following table.

Sensitivity	Variance	IRR (%)	NPV @ 5% (\$000s)	Pay Back (Years)
Metal Prices	Increase 20%	25.5	2,477,072	4.0
	Increase 10%	22.2	2,000,231	5.8
	Decrease 10%	14.9	1,045,275	6.3
	Decrease 20%	10.6	562,892	8.3
Metal Recoveries	Increase 20%	24.3	2,304,027	4.3
	Increase 10%	21.6	1,915,894	5.3
	Decrease 10%	15.6	1,133,202	5.8
	Decrease 20%	12.2	736,683	7.1
Operating Costs	Increase 20%	15.8	1,209,764	5.9
	Increase 10%	17.3	1,365,572	6.2
	Decrease 10%	20.1	1,676,586	5.6
	Decrease 20%	21.5	1,831,266	5.2
Capital Costs	Increase 20%	16.1	1,366,719	6.5
	Increase 10%	17.3	1,444,357	6.0
	Decrease 10%	20.2	1,597,296	4.9
	Decrease 20%	22.0	1,672,991	5.3
Compressed Schedule	SAG #1 starts 1/1/09 SAG #2 starts 1/1/11	20.7	1,616,726	4.8
Base Case Ref	Total Metal Production	18.7	1,521,378	5.6

Over the 17 year mine life, the sulphide ore mill is expected to produce approximately 5.12 million tonnes of zinc concentrate and 2.36 million tonnes of lead concentrate containing a total of 387.6 million ounces of

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silver, 6.60 million ounces of gold, 1.2 million tonnes of lead and 2.59 million tonnes of zinc. The oxide ore leach plant is expected to produce a further 17.9 million ounces of silver and 396,000 ounces of gold.

**Total Metal Production**

The metals contained in concentrate are subject to smelter deductions, resulting in a payable metals quantity slightly lower than metals produced in concentrate. Figures 1-21 through 1-24 illustrate payable metals by year.

**1.3.15 Peñasquito Project Operating and Production Cost**

	<b>Co-Product Accounting</b>		
	<b>Gold (\$/ounce) Net of Lead</b>	<b>Silver (\$/ounce)</b>	<b>Zinc (\$/pound)</b>
Unit Total Cash Cost (Includes taxes and royalty)	125.41	4.91	0.44
Unit Total Cost (Also includes reclamation and depreciation)	185.36	5.91	0.53

The unit total cash cost of payable gold ounces is \$(378), treating all other metals as by products.

**1.3.16 Property Description and Location**

Glamis owns 100% of the mineral rights to a large area covering approximately 39,000 hectares located in the north-eastern portion of the State of Zacatecas (Figures 1-1 and 1-2) in north-central Mexico. As shown on Figures 1-3 and 1-4, the portion of this area referred to as the Peñasquito property lies approximately 27 km west of the town of Concepción del Oro in a wide, generally flat valley covered by coarse grasses and cacti.

Investigations on this property have identified several major sulphide mineralization zones with significant values of silver, gold, zinc and lead (Figure 1-9). This study considers the economic development of two zones, the Peñasco and the Chile Colorado, which have been the subject of most of the geological and metallurgical investigations to date. Preliminary resource investigation has been performed on two additional zones, Azul Breccia and El Sotol, but no development plan has yet been evaluated. In addition to the sulphide mineralization, the Peñasco and the Chile Colorado zones also have substantial oxide ore and mixed ore (oxide/sulphide transition material) caps which contain recoverable gold



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and silver. The gold and silver recovered from the oxide and mixed ores have been included in the project economic evaluation.

1.3.17 Development Plan

The sulphide ore bodies will be developed in sequence beginning with the Peñasco pit followed by the Chile Colorado pit. Overburden and oxide ore will be stripped to allow access to the sulphide ore. Oxide ore, as it is encountered during the stripping, will be placed on a leach pad. The run-of-mine oxide material will be leached with sodium cyanide solution and gold and silver will be recovered through a Merrill-Crowe processing facility. The rate at which oxide ore is placed on the leach pad varies from about 10,000 metric tonnes per day (MTPD) to 50,000 MTPD during the first seven years of operation and at a diminished rate over an additional nine years.

The sulphide ore will be mined as follows:

- a) Peñasco Pit (50,000 MTPD nominal) operating Years 1 through 2.
- b) Peñasco Pit (100,000 MTPD nominal) operating Years 3 through 12.
- c) Peñasco Pit (50,000 MTPD) and Chile Colorado Pit (40,000 MTPD) operating Years 13 and 14.
- d) Chile Colorado Pit (80,000 MTPD nominal) operating Years 15 through 16.

As indicated above, during Years 13 and 14, both pits will be mined simultaneously.

The Azul zone is contiguous with the northern edge of the Chile Colorado pit. For this report, the Azul resources are not included in any technical or financial analyses. El Sotol is a zone of mineralization to the west of Peñasco. Like Azul, its tabulated resources are not included in any technical or financial evaluation.

1.3.18 Resources Tabulation

Glamis with Independent Mining Consultants (IMC) developed block models for both the Peñasco (including El Sotol) and Chile Colorado (including Azul) deposits based on exploration drilling performed by Glamis and predecessor companies. Data through Drilling Campaign 17 in March 2006 was used.

Reported resources are based on a floating cone geometry that used reasonably foreseeable long term metals prices. These prices are: \$650/oz gold, \$10/oz silver, \$0.43/lb lead and \$0.86/lb zinc. This defines a

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resource that has the potential of being mined by open pit methods and is not the total block model contained mineralization, i.e., higher metal prices would define a still larger resource than reported herein.

An explanation of Net Smelter Return (NSR) is included here for reference. For mineral deposits whose value is tied up in one commodity, mining ore cut-offs are customarily defined in terms of the grade of that commodity, e.g., less than 0.2 grams/tonne gold defined as waste, greater than or equal to 0.2 grams/tonne gold defined as ore. In the case of mineral deposits containing two economic metals, such as gold-silver deposits, it is common to report mineral resources at a cut-off grade in equivalent gold or equivalent silver, depending on which metal has greater financial contribution. In polymetallic deposits, such as lead-zinc-silver-gold deposits, the definition of ore is commonly described in terms of Net Smelter Return (NSR), the difference between revenues for the summation of the metals minus the costs downstream from the mining property.

Definitions bear repeating here.

1. NET SMELTER RETURN (NSR) equals the amount paid by the smelter and is calculated as the value of metals content minus the summation of smelter and refinery charges (including penalty elements) plus shipping costs (including inland transportation, port handling fees, etc.) plus any broker transaction costs. Glamis is paying Kennecott a royalty based on this definition. A mine's gross NSR must be higher than the mining property's operating and maintenance costs plus a prudent profit margin.
2. The BREAKEVEN CUT-OFF for pit configuration is determined by cone economics using an algorithm that takes into account NSR, mining costs, lift costs, stripping costs, royalties, G&A and mill process costs. This will be a higher number than the Internal NSR Cut-off.
3. The INTERNAL NSR CUT-OFF grade is equal to the G&A plus mill processing costs. Any material that is mined and hauled to the rim of the pit (and as such the costs can be considered to be sunk), will be directed to the mill if its NSR exceeds the G&A plus mill processing costs or to a waste dump if its value is less than G&A plus mill processing costs. The INTERNAL NSR CUT-OFF would imply mining marginal material at a loss, but it would be less of a loss than sending the material to a waste dump. Obviously, enough high Internal NSR material must be present to offset the marginal material.

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An NSR value for the sulphide, mixed and oxide materials was calculated using input data on operating costs, metallurgical recoveries, metal pricing and smelter terms effective the end of the second quarter of 2006. A flotation milling process has been defined for the sulphide material with an Internal NSR Cut-Off of \$3.60 for Peñasco and a \$4.18 NSR for Chile Colorado. A run-of-mine, heap leach process for gold and silver has been defined for the oxide and mixed materials with an Internal NSR Cut-Off calculated at \$1.30 for both pits.

The mineral resources inventory has increased significantly since the late 2005 report, and continued drilling to convert these resources is expected to provide the basis for future reserve growth. The current mineral resources are summarized in the following Tables 1-1 and 1-2:

**Table 1-1 Peñasquito Mineral Resources Summary Data June 21, 2006**

	<b>Feasibility November 2005</b>	<b>Update June 2006</b>	<b>% Change</b>
<b>Measured &amp; Indicated Resource</b>			
(inclusive of proven and probable reserves)			
Tonnes (millions)	671.3	872.5	30%
Contained Metals			
Gold (troy ounces millions)	8.7	12.8	47%
Silver (troy ounces millions)	614	822	34%
Lead (tonnes millions)	1.8	2.4	33%
Zinc (tonnes millions)	4.1	5.3	29%
<b>Inferred Resource</b>			
Tonnes (millions)	246.7	2,577.0	945%
Contained Metals			
Gold (troy ounces millions)	2.8	14.3	411%
Silver (troy ounces million)	192	882	359%
Lead (tonnes million)	0.6	2.4	300%
Zinc (tonnes millions)	1.4	7.1	407%

In accordance with NI 43-101 guidelines, only material in the measured and indicated categories has been used in the economic evaluation of these deposits. In addition, only the Peñasco and Chile Colorado deposits have been used.

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**Table 1-2a Peñasquito Project Mineral Resources Measured Category**

MEASURED CATEGORY	Tonnes (Millions)	Gold	Gold	Silver	Silver	Lead	Lead	Zinc	Zinc
		Grade (gpt)	(Ounces)	Grade (gpt)	(Ounces)	Grade (%)	Tonnes (Millions)	Grade (%)	Tonnes (Millions)
Peñasco Oxide Resource	53.9	0.28	480,000	24.9	43,101,000				
Peñasco Sulfide Resource	242.6	0.65	5,095,000	31.1	242,693,000	0.33	0.8	0.74	1.8
Chile Colorado Oxide Resource	30.4	0.18	176,000	17.3	16,950,000				
Chile Colorado Sulfide Resource	139.6	0.28	1,258,000	35.6	159,592,000	0.37	0.5	0.80	1.1
Combined Oxide Measured Resources	84.3	0.24	656,000	22.2	60,051,000				
Combined Sulfide Measured Resources	382.3	0.52	6,353,000	32.7	402,285,000	<b>0.34</b>	<b>1.3</b>	<b>0.76</b>	<b>2.9</b>
<b>Combined Measured Resources</b>	<b>466.6</b>	<b>0.47</b>	<b>7,009,000</b>	<b>30.8</b>	<b>462,336,000</b>				

**Table 1-2b Peñasquito Project Mineral Resources Indicated Category**

INDICATED CATEGORY	Tonnes (Millions)	Gold	Gold	Silver	Silver	Lead	Lead	Zinc	Zinc
		Grade (gpt)	(Ounces)	Grade (gpt)	(Ounces)	Grade (%)	Tonnes (Millions)	Grade (%)	Tonnes (Millions)
Peñasco Oxide Resource	20.8	0.31	208,000	21.8	14,569,000				
Peñasco Sulfide Resource	263.3	0.58	4,941,000	29.2	246,957,000	0.29	0.8	0.67	1.8
Chile Colorado Oxide Resource	19.1	0.14	89,000	17.5	10,776,000				
Chile Colorado Sulfide Resource	102.7	0.16	517,000	26.4	87,233,000	0.32	0.3	0.64	0.7
Combined Oxide Indicated Resources	39.9	0.23	297,000	19.7	25,345,000				
Combined Sulfide Indicated Resources	366.0	0.46	5,458,000	28.4	334,190,000	<b>0.30</b>	<b>1.1</b>	<b>0.66</b>	<b>2.4</b>
<b>Combined Indicated Resources</b>	<b>405.9</b>	<b>0.44</b>	<b>5,755,000</b>	<b>27.5</b>	<b>359,535,000</b>				

**Table 1-2c Peñasquito Project Mineral Resources Inferred Category**

INFERRED CATEGORY	Tonnes (Millions)	Gold	Gold	Silver	Silver	Lead	Lead	Zinc	Zinc
		Grade (gpt)	(Ounces)	Grade (gpt)	(Ounces)	Grade (%)	Tonnes (Millions)	Grade (%)	Tonnes (Millions)
Peñasco Oxide Resource	22.9	0.14	101,000	10.7	7,900,000				
Peñasco Sulfide Resource	1,041.7	0.28	9,365,000	14.5	485,522,000	0.13	1.4	0.38	4.0
Chile Colorado Oxide Resource	149.1	0.06	287,000	5.0	23,793,000				
	1,362.9	0.10	4,514,000	8.3	364,539,000	0.08	1.0	0.23	3.1

Chile Colorado Sulfide Resource									
Combined Oxide Inferred Resources	172.0	0.07	388,000	5.7	31,693,000				
Combined Sulfide Inferred Resources	2,404.6	0.18	13,879,000	11.0	850,061,000	<b>0.10</b>	<b>2.4</b>	<b>0.29</b>	<b>7.1</b>
<b>Combined Inferred Resources</b>	<b>2,576.6</b>	<b>0.17</b>	<b>14,267,000</b>	<b>10.6</b>	<b>881,754,000</b>				

## Notes:

- 1) The terms Mineral Resource and Reserves as used herein conform to the definitions contained in the National Instrument 43-101 which adopts those published by the Canadian Institute of Mining, Metallurgy, & Petroleum (CIM). These resource and reserves estimates have been prepared under the supervision of James S. Voorhees, Executive Vice President and Chief Operating Officer of Glamis Gold Ltd., who is a Qualified Person as defined in National Instrument 43-101.

- 2) Reserves have been calculated using assumed long-term metals prices as follows: Gold \$450 per ounce; Silver \$7.00 per ounce; Zinc \$0.60 per pound and Lead \$0.30 per pound.  
Mineral Resources have been calculated using assumed long-term metals

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prices as follows: Gold \$650 per ounce; Silver \$10.00 per ounce; Zinc \$0.86 per pound and Lead \$0.43 per pound.

- 3) Measured plus Indicated (M&I) Resources are defined as being inside an optimized floating cone geometry that was developed using the Mineral Resource metal prices set forth above and all classifications of material. This defines a resource that has the potential of being mined by open pit methods and is not the total block model contained mineralization. In the Peñasco deposit, Measured Resources are defined as any block within the reasonably foreseeable open pit that is within 35 meters of two or

more drill holes.  
In the Peñasco  
deposit,  
Indicated  
Resources are  
defined as any  
block within the  
reasonably  
foreseeable  
open pit not  
defined as  
Measured that is  
within 70  
meters of two or  
more drill holes.  
In the Chile  
Colorado  
deposit,  
Measured  
Resources are  
defined as any  
block within the  
reasonably  
foreseeable  
open pit that has  
five or more  
holes within 135  
meters of the  
block with the  
closest hole no  
more than 50  
meters distance.  
In the Chile  
Colorado  
deposit,  
Indicated  
Resources are  
defined as any  
block within the  
reasonably  
foreseeable  
open pit not  
defined as  
Measured that  
has two or more  
holes within 135  
meters of the  
block with the  
closest hole no  
more than 70  
meters distance



- 4) The M&I Resources have been calculated using NSR (Net Smelter Return) cut-off grades and assuming the long-term Mineral Resource metals prices set forth above. For oxide M&I resources, an NSR cut-off grade of \$1.30 was applied. For sulfide M&I Resources, an NSR cut-off grade of \$3.60 was applied.
  
- 5) In the Peñasco deposit, Inferred Resources are defined as any block within the computer model not defined as Measured or Indicated that is located within a manually defined mineralized grade domain. The grade domain was developed using geologic interpretation of drill hole assays, lithology and alteration data. In the Chile Colorado deposit, Inferred Resources are defined as any

block within the computer model not defined as Measured or Indicated that is located within 135 meters of a drill hole.

- 6) The Inferred Resources have been stated using NSR cut-off grades and assuming the long-term Mineral Resource metals prices set forth above. For oxide Inferred Resources, an NSR cut-off grade of \$0.70 was applied and for sulfide Inferred Resources, an NSR cut-off grade of \$1.60 was applied, with both cut-off grades being based on reserve metal prices.

- 7) Reserves are a subset of Measured and Indicated Resources.

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Exploration drilling at Peñasquito is currently underway, concentrating on three key areas:

**Conversion of In-Pit Resources** Within the two open pits, 75 million tonnes of mineralization contained in the inferred resource category are currently classified as waste rock for the purposes of the economic analysis. In-fill drilling is expected to increase confidence in these areas and should result in a conversion of a portion of the resource into reserves and a corresponding reduction in the stripping ratio.

**Extension of Mineralized Zones** The known mineralization remains open, both at the southern end of the Peñasco deposit and the northern end of the Chile Colorado deposit, toward and including the Azul target. Step-out drilling will continue in an effort to extend the deposits and ultimately join the currently separate open pits.

**Underground Opportunity** In the Peñasco deposit, intersections of high grade mineralization have been identified beneath the designed pit. A portion of the drilling program in 2006 will test deeper targets to investigate the possibility of future bulk underground mining.

1.3.19 Reserves Tabulation

A Net Smelter Return (NSR) value for the sulphide, mixed and oxide materials was calculated using input data on operating costs, metallurgical recoveries, metal pricing and smelter terms effective the end of the second quarter of 2006. A flotation milling process has been defined for the sulphide material with an Internal NSR Cut-Off calculated at \$3.60 for Peñasco and a \$4.18 for Chile Colorado. A run-of-mine, heap leach process for gold and silver has been defined for the oxide and mixed materials with an Internal NSR Cut-Off calculated at \$1.30 for both pits.

The proven and probable reserves for the deposits are contained within engineered pit designs based on a floating cone analysis of the resource block models using only the measured and indicated sulphide, mixed and oxide resources.

Inferred resources are not included in the reserve estimations. Tables 1-3 and 1-4 summarize the data.

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**Table 1-3 Peñasquito Proven and Probable Reserves Summary Data June 21, 2006**

	<b>Feasibility November 2005</b>	<b>Update June 2006</b>	<b>% Change</b>
<b>Ore Tonnes (millions)</b>			
Oxide (heap leach)	77.3	87.1	13%
Sulfide (flotation)	257.8	476.9	85%
Total Ore Tonnes (millions)	335.1	564.0	68%
<b>Oxide Ore Grade</b>			
Gold (grams per tonne)	0.29	0.28	-3%
Silver (grams per tonne)	24.0	23.8	-1%
<b>Sulfide Ore Grade</b>			
Gold (grams per tonne)	0.51	0.60	18%
Silver (grams per tonne)	30.2	33.2	10%
Lead (%)	0.31	0.35	13%
Zinc (%)	0.69	0.76	10%
<b>Contained Metals</b>			
Gold (troy ounces millions)	4.93	9.98	102%
Silver (troy ounces millions)	310	575	86%
Lead (tonnes millions)	0.79	1.67	111%
Zinc (tonnes millions)	1.78	3.62	103%
<b>Stripping Ratio</b>	1.95	2.76	42%

(tonnes waste: oxide ore plus sulfide ore)

The pit shell geometry was designed using the following metal prices: gold at \$450/ounce, silver at \$7.00/ounce, lead at \$0.30/pound, and zinc at \$0.60/pound. Having developed a conservative geometry, end of June 2006 M3 prices were then used in the economic evaluation.

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**Table 1-4a Peñasquito Project Reserves Proven Category**

<b>PROVEN CATEGORY</b>	<b>Ore Tonnes (Millions)</b>	<b>Gold Grade (gpt)</b>	<b>Gold Ounces</b>	<b>Silver Grade (gpt)</b>	<b>Silver Ounces</b>	<b>Lead Grade (%)</b>	<b>Lead Tonnes (Millions)</b>	<b>Zinc Grade (%)</b>	<b>Zinc Tonnes (Millions)</b>
Peñasco Pit Oxide	51.6	0.28	471,000	25.4	42,136,000				
Peñasco Pit Sulfide	221.2	0.67	4,733,000	32.2	228,967,000	0.35	0.8	0.77	1.7
Chile Colorado Pit Oxide	16.7	0.22	120,000	20.3	10,878,000				
Chile Colorado Pit Sulfide	46.7	0.29	442,000	50.9	76,372,000	0.56	0.3	0.97	0.5
Combined Pits Oxide Proven Reserves	68.2	0.27	591,000	24.2	53,014,000				
Combined Pits Sulfide Proven Reserves	267.9	0.60	5,175,000	35.4	305,339,000	0.38	1.0	0.81	2.2
Combined Pits Proven Reserves	336.2	0.53	5,766,000	33.2	358,353,000				

**Table 1-4b Peñasquito Project Reserves Probable Category**

<b>PROBABLE CATEGORY</b>	<b>Ore Tonnes (Millions)</b>	<b>Gold Grade (gpt)</b>	<b>Gold Ounces</b>	<b>Silver Grade (gpt)</b>	<b>Silver Ounces</b>	<b>Lead Grade (%)</b>	<b>Lead Tonnes (Millions)</b>	<b>Zinc Grade (%)</b>	<b>Zinc Tonnes (Millions)</b>
Peñasco Pit Oxide	16.6	0.35	186,000	23.4	12,465,000				
Peñasco Pit Sulfide	207.3	0.60	3,999,000	30.2	201,405,000	0.31	0.6	0.70	1.5
Chile Colorado Pit Oxide	2.2	0.22	16,000	14.7	1,060,000				
Chile Colorado Pit Sulfide	1.7	0.25	14,000	28.9	1,578,000	0.34	0.0	0.65	0.0
Combined Pits Oxide Probable Reserves	18.8	0.33	202,000	22.4	13,525,000				
Combined Pits Sulfide Probable Reserves	209.0	0.60	4,013,000	30.2	202,983,000	0.31	0.6	0.70	1.5
Combined Pits Probable Reserves	227.8	0.58	4,215,000	29.6	216,508,000				

**Table 1-4c Peñasquito Project Reserves Proven + Probable Totals**

<b>PROVEN + PROBABLE TOTALS</b>	<b>Ore Tonnes (Millions)</b>	<b>Gold Grade (gpt)</b>	<b>Gold Ounces</b>	<b>Silver Grade (gpt)</b>	<b>Silver Ounces</b>	<b>Lead Grade (%)</b>	<b>Lead Tonnes (Millions)</b>	<b>Zinc Grade (%)</b>	<b>Zinc Tonnes (Millions)</b>
Peñasco Pit Oxide	68.2	0.30	657,000	24.9	54,601,000				
Peñasco Pit Sulfide	428.5	0.63	8,732,000	31.2	430,372,000	0.33	1.4	0.74	3.2
Chile Colorado Pit Oxide	18.9	0.22	136,000	19.6	11,938,000				
Chile Colorado Pit Sulfide	48.4	0.29	456,000	50.1	77,950,000	0.55	0.3	0.96	0.5
Combined Pits Oxide P+ P Reserves	87.1	0.28	793,000	23.8	66,539,000				
Combined Pits Sulfide P+ P Reserves	476.9	0.60	9,188,000	33.2	508,322,000	0.35	1.7	0.76	3.6
Combined Pits P+ P Reserves	564.0	0.55	9,981,000	31.7	574,861,000				



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The combined life-of-mine stripping ratio is 2.76 if oxide, mixed, and sulphide ores are taken into account. The stripping ratio is 3.44 if only the sulphide ore is used, i.e., the oxide and mixed ore is considered waste.

Major and support mine equipment are tabulated in Tables 1-5 and 1-6.

**Table 1-5 Major Mine Equipment**

	<b>**Units</b>
P&H 250XP Diesel Blast Hole Drill **	8
P&H 4100 Shovel, 41 Cum Bucket	4
LeTourneau L-1850 Hi Lift, 25 Cum Bucket**	2
Komatsu 930E Series III Haul Truck**	75
Cat D9T Track Dozer (Stockpile/Tailing Pond)	2
Cat D10T Track Dozer**	6
Cat 854G Wheel Dozer	2
Cat 16H Motor Grader**	5
Cat 777D Water Truck**	5
Cat 988H Wheel Loader, Concentrate Loading	1
IR ECM 590/YH Rock Drill	1
Cat 325BL Excavator (W-hammer)	3
<b>Subtotal Major Equipment</b>	<b>114</b>

\*\* Replacement  
units not  
included in  
totals

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**Table 1-6 Mine Support Equipment**

	<b>Units</b>
Fuel/Lube Truck (18,500 ltr.)	2
Blast Hole Stemmer	3
Blasters Flatbed Truck (2 T)	2
ANFO/Slurry Truck (18mt)	3
Cable Reeler	2
Crane Truck (25T)	1
Shop Forklift (Hyster H100XM)	2
R T Forklift (Sellick SD-100)	2
Mechanics Truck	3
Welding Truck	3
Grove 120 Crane	1
CAT 160H Motor Grader, Road Crew	1
CAT 420 Backhoe, Road Crew	1
4000 gal Water Truck, Road Crew	1
2660 Trailer for Backhoe, Road Crew	1
Dump Truck, 10 yd, Road Crew	1
Skidsteer Loader	1
Cat IT38 IT with Tire Handler	2
Crew Bus	6
Pickup Truck (4x4)	40
Portable Light Towers	14
Mine Communications System	1
Mine Radios	173
Water Pipe-Dewatering	8
Mine Pumps	5
Mine Dispatch System	2
Generator on Trailer (Shovel Movement)	1
<b>Subtotal Mine Support Equipment</b>	<b>282</b>

#### 1.3.20 Facilities

Ore and waste will be mined using four electric shovels and two large front end loaders, and a fleet of diesel/electric haul trucks; the number of haulage units will vary from 15 in Year 1 (2007) to 75 in Year 11 (2017) depending on the phase of the development.

Run-of-mine oxide and mixed ore will be hauled for placement on the leach pad. The heap leach system will treat the ore with sodium cyanide solution to produce a pregnant solution bearing the precious metals. A Merrill-Crowe zinc precipitation process will be used to recover gold and silver from pregnant solution. Precipitate containing precious metals will be de-watered with plate-and-frame filter presses, treated in a retort furnace, and poured into doré molds. The sulphide ore will be processed through a conventional crushing, milling and flotation facility. Haul trucks will deliver ore to a primary crusher; crushed ore will be conveyed to a SAG mill, dual ball mill setup,



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and pebble crusher facility. Ground and classified sulphide ore will be piped to the flotation circuit where the ore will be processed to produce a lead concentrate and zinc concentrate. In the later years of the Chile Colorado development, carbonaceous materials must be floated prior to lead flotation. The concentrate slurries will first be thickened and then dewatered using pressure filters. The dewatered concentrates will be stockpiled before loading onto highway road vehicles for transport to in-country smelters or to the ports for export to foreign smelters.

1.3.21 Utilities

Process water will be initially obtained from wells to be developed on site and supplemented during later development from pit dewatering. Process design will highlight water conservation. Section 1.7 includes further discussion on water rights.

As a result of several productive meetings with Comisión Federal de Electricidad (CFE), the federal government utility company, the Feasibility Study assumes that power will be available from a 400kV power line tapped in reasonable proximity to the site. (Figure 1-4). From this location, power will be transmitted at 400kV from the 400kV/400kV switchyard tap in via a new overhead power line to the mine site main 400kV/69kV substation. The power rate of \$0.06/kWhr used in the feasibility study is based on CFE's published interruptible power rates with limited power shedding during peak hours (approximately 15 hours on average per week). Power shedding is accomplished mainly by operating only one of the two ball mills during these peak hours and performing scheduled maintenance on the off-line unit.

1.3.22 Infrastructure

The mine site is located 27 km west of Concepción del Oro (Figures 1-3 and 1-4) which is situated on Highway 54, a well maintained, major highway. A new road is being constructed by the State of Zacatecas from just east of the mine site to Highway 54 which will provide good road access for the mine. Currently, construction is stymied for lack of state funds. The road is completed to both sides of a pass. This pass needs to be completed prior to the start of construction. Glamis has allowed \$2.5 million for this road construction.

A rail head is located some 100 km west of the mine site at Estación Camacho. This sparsely populated area is easily accessed by a gravel road directly from the site. The rail line represents an opportunity for transportation, but this study is based on truck haulage to ocean ports or domestic smelters.

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1.3.23 Metallurgy Test Program

Three hundred and sixty-eight development metallurgical tests were undertaken on sulphide ore, and a further 99 were undertaken on oxide ore. Locked cycle tests on ore from both the Peñasco and Chile Colorado deposits were performed as part of the flotation test program in order to provide a basis for the projected plant recoveries. These tests revealed that recoveries in the Peñasco Pit correlated with three basic lithologic categories: breccia, intrusive and sedimentary. Recoveries in the Chile Colorado tests have not yet revealed an obvious correlation. Work is ongoing to provide additional data for prediction of metal recoveries. Based on the most recent results, the metallurgical recoveries reported in Section 1.3.7 were determined.

1.3.24 Smelters and Refineries

Concentrates from the plant are expected to be custom processed at both local and overseas smelters. For the purpose of this study it has been assumed that the lead concentrate sales will be largely processed locally within Mexico. Alternatively, lead concentrate could be smelted in Canada, Asia or Europe. Such alternatives may provide for competition in the negotiation of smelter terms. Zinc concentrate treatment will most probably be split between Mexican and overseas markets in Canada, Asia or Europe. Concentrate destined for overseas markets will be hauled to the appropriate port; on the west coast for Asian and Canadian sales and the east coast for European and Canadian sales.

Smelter terms and transportation costs assumed for the project are considered typical and are not the result of negotiations with any particular smelter. The terms and cost assumptions are based on payable metals, deductions and payment terms.

Doré will likely be shipped to either Salt Lake City, Utah or Torreon, Mexico for refining.

1.3.25 Conclusions

This project has a number of favorable characteristics:

Established threshold for NPV and IRR with economics that withstand sensitivity tests.

Recoveries used for financial analysis are less than those achieved in laboratory testing for Peñasco and Chile Colorado ores. The likelihood exists that laboratory recoveries will eventually be realized by operations.

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Minimum mine life of 17 years. This life significantly exceeds metal pricing cycles. The payback period is 5.6 years.

Opportunity to improve financials by compressing project schedule.

High daily tonnage production.

Early revenue from leaching oxide ore to produce silver/gold doré.

Favorable site with relatively low earthwork costs.

Potential for more conversion of waste to ore with infill drilling, i.e., reduced stripping ratio.

Significant opportunity to develop the Azul deposit as a connector of Chile Colorado and Peñasco pits.

Reasonable opportunity to develop underground deposits.

Reasonable opportunity to improve the threshold Chile Colorado recoveries that have already been established by laboratory testing.

Favorable business atmosphere in the setting of long established mining district heritage.

Ideal technical power provider situation, i.e., tap off of 400 kV national grid.

#### **1.4 Introduction & Terms Of Reference**

In 1998 Western Silver acquired the entire Peñasquito property from Kennecott. Glamis acquired Western Silver on May 3, 2006. Since 2002 Western Silver and Glamis have undertaken a continuous series of drilling campaigns on the property. Initially, attention focused on Chile Colorado but more recently attention shifted to Peñasco. Figure 1-7 shows the claims in the immediate area affected by this development.

In March of 2003 Western Silver completed an internal scoping study on the development of the Chile Colorado deposit. Western Silver requested that M3 review this document and produce a scoping level document of its own. This led to the production in March 2004 of a Pre-feasibility Study which also focused on the development of Chile Colorado.

In April 2004 following the encouraging results of the Pre-feasibility Study, Western Silver requested M3 continue to work on the Peñasquito Project to produce a comprehensive Feasibility Study suitable for financing purposes. With the exception of geology, drilling and assay data, which Western Silver would provide, M3 was assigned full responsibility for all other aspects of the study. The Feasibility Study would consider the development of both the Chile Colorado and

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Peñasco deposits including the oxide caps that had not been evaluated in the Pre-feasibility Study.

During the course of their work on the Peñasquito Project, M3 has authored the following previous studies for the Peñasquito site:

In July 2003 M3 Engineering and Technology Corporation completed and issued a Scoping Study and Capital Cost Estimate for the Chile Colorado ore body on behalf of Western Silver. The study was based upon a Preliminary Mineral Resource Estimate prepared by SNC-Lavalin Engineers and Constructors, Inc. The study demonstrated that the project was economically viable at the prevailing metal prices, but approximately 20% of the material in the pit at the time was still categorized as inferred.

In September of 2003, Western Silver authorized M3 to commence work on a Pre-Feasibility Study for the project. At the same time, Western Silver commenced work on an in-fill drilling program on the Chile Colorado deposit with a view to upgrading the confidence level of the material in the pit to the point where it could all be reported in the measured and indicated category as required by NI 43-101.

In March 2004, M3 completed and issued this Pre-feasibility Study for the Chile Colorado deposit. This study confirmed the apparent economic viability of the project and the report summary was made public by Western Silver.

In October of 2004, M3 produced a confidential Scoping Study for Western Silver's internal use only. The purpose of the Scoping Study was to consider the impact of mining the Peñasco and Chile Colorado ore bodies in combination. It was based on the pre-feasibility resource model of Chile Colorado and an early version of the Peñasco resource model developed by Western Silver. Various financial analyses were developed for different pit development scenarios. The study also looked at heap leaching oxide ore from both the Chile Colorado and the Peñasco deposits. This study concluded that mining both ore bodies potentially yielded a higher IRR and NPV than the March 2004 Pre-feasibility Study and warranted further study.

In November 2004, M3 Engineering completed a confidential Heap Leach Study for the Peñasquito Project for Western Silver's internal planning use. This study concluded that the oxide ore bodies were not sufficient on their own to justify a project, but that processing oxide ore in concert with the development of the sulphide ore could add value.

As part of these ongoing earlier efforts, SNC-Lavalin Engineers and Constructors, Inc. (SNC) prepared a report entitled, Peñasquito Deposit - Mineral Resource Estimate for the Chile Colorado Zone, March 2004, which was an update to the Minera Peñasquito S.A. de C.V. Peñasquito Preliminary

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Mineral Resource Estimate, March 2003. In addition, SNC prepared a report outlining the mineral resource estimate for the Peñasco zone. In an independent effort during the last quarter of 2004, and to provide further assurance, M3 reviewed the base data and validated and accepted the SNC findings in M3's Amended and Restated Peñasquito Pre-Feasibility Study, December 10, 2004.

In February 2005, M3 Engineering completed a confidential Capital Cost Update for the Heap Leach Study, which included a mine fleet cost analysis. This study further substantiated the findings of the November 2004 study, and verified the potential financial worthiness of processing oxide ore given the facilities already being in place for sulphide ores.

In March 2005, M3 completed an Interim Feasibility Study for internal use, based on developing both the Peñasco and Chile Colorado pits. This report concluded that if Peñasco inferred resources could be advanced to the measured and indicated categories, the project NPV would increase. Accordingly, an infill drilling campaign was initiated by Glamis.

In November 2005, M3 completed the Feasibility Study for the 50,000 MTPD plant and recommended that the project go forward.

The study at hand was authorized by the prospective new owner, Glamis, on April 2, 2006. Glamis and its consultants have developed all resource and reserve models, i.e., qualifying persons for this Feasibility Study are Glamis personnel.

Other data and information used in the study has been collected independently by M3 and is explained and/or referenced in further detail in the subsequent sections.

Personnel from the M3 Tucson office and M3 sub-consultants (Huss, Gonzalez, Austin, Nacif, Teyechea, Oliver, Hanks, Welhener, Ayala, A. Bennett, J. Bennett, Gomez, Griego, Hensley, and Wythes) have made visits to the site for the purpose of collecting information and gaining an understanding of the local conditions. In addition, several Glamis personnel have visited the site.

**1.5 Disclaimer**

All resource modeling, metallurgy, process development, environmental program, initial groundwater investigations, archaeological reviews, mine design, metals pricing, and plant design have been directed by Glamis, M3, or under their direction by one of their consultants.

Glamis has provided information on Land Position & Status and Geology.

Glamis has taken the lead role in environmental, water, resources, and mine planning.

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Information on underground potential has been generated by Wardrop Engineering, Inc. of Vancouver, B.C. and provided to M3 by Glamis.

**1.5 Property Description & Location**

Peñasquito is situated in the western half of the Concepción del Oro district in the northeast corner of Zacatecas State, Mexico, approximately 200 km northeast of the city of Zacatecas, approximately 24°45' N latitude/101°30' W longitude. Figure 1-1 shows the general location in Mexico. The closest major town is Concepción del Oro which lies on Mexican highway 54, a well maintained, paved highway which links the major cities of Zacatecas (in the state of Zacatecas), approximately 250 km to the southwest with Saltillo (in the state of Coahuila) approximately 125 km to the northeast. Figure 1-2 shows its location in the state.

Some 20 km to the northeast, on the north side of Sierra el Mascaron, is the Tayahua Mine at Terminal and Concepción del Oro is the site of the Macocozac Mine. The following table lists claims affected by the development of the Peñasquito Project. This table is not a complete list of Glamis claims in the area.

**Table 1-7 List of Pertinent Claims**

CLAIM	TYPE	TITLE	FILE NO.	AREA HECTARES	DATE ISSUED	EXP. DATE
EL PEÑASQUITO	EXPLOIT.	196289	43/885	2.000	1993-07-16	2011-07-11
LA PEÑA	EXPLOIT.	203264	07/1.3/547	58.000	1996-06-28	2046-06-27
LAS PEÑAS	EXPLOIT.	212290	8/1.3/00983	40.000	2000-09-29	2050-09-28
ALFA	EXPLOIT.	201997	7/1.3/485	1100.000	1995-10-11	2045-10-10
BETA	EXPLOIT.	211970	8/1.3/01137	2054.761	2000-08-18	2050-08-17
SEGUNDA RED. CONCHA	EXPLOR.	218920	8/2/00018	23304.691	2000-11-07	2006-11-06
MAZAPIL 3 F. I	EXPLOR.	217001	007/13852	1950.702	2002-06-14	2008-06-13
MAZAPIL 10	EXPLOR.	223327	93/26975	1073.555	2004-10-02	2010-10-01

M3 has not verified Glamis title to the mineral rights covered by the Chile Colorado and Peñasco deposits. However, a qualified Mexican attorney, Dr. Francisco Heiras Mancera, has issued an opinion dated December 23, 2004, stating that Glamis legally owns the mineral rights and is in full compliance with its legal obligations.

Based on Glamis acquisition agreement, a 2% NSR royalty is owed to Kennecott on production from both the Chile Colorado and Peñasco locations. A further 3% NSR royalty is owed to Grupo Industrial de Coahuila S.A. de C.V. as assignee from Minera Catasillas, S.A. de C.V., on the El Peñasquito, Las Peñas, La Peña,

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Mazapil and Mazapil 2 concessions. This obligation has been purchased by Glamis.

In addition to the Chile Colorado, Peñasco Azul, and El Sotol deposits, further mineralization is known to exist in areas known as Las Palmas, Chamisal, and Northeast Azul targets, some of which are also shown on Figure 1-9.

Limited information has been obtained on these latter deposits.

There is no previous mine development of any form in the immediate area of Chile Colorado or Peñasco deposits and as such no environmental liabilities are attached to the property. All drilling pads are cleaned and rehabilitated on an ongoing basis.

Glamis is currently in possession of valid exploration permits for the drill work being performed in the area. The development of a mine at this location will require additional permits from state and federal authorities. These permits are listed in detail in Volume II of the Feasibility Study and are addressed in the EIA.

**1.7 Accessibility, Climate, Local Resources, Infrastructure And Physiography**

**1.7.1 Physiography**

The deposits occur in a wide valley bounded to the north by the Sierra El Mascarón and the south by the Sierra Las Bocas. Except for one small outcrop, the area is covered by up to 30 meters of alluvium. The terrain is generally flat, rolling hills; vegetation is mostly scrub, with cactus and coarse grasses. The prevailing elevation of the property is approximately 1900 m above sea level.

**1.7.2 Infrastructure**

An adequate network of road and rail services exists in the region. Road access to the site is presently gained west out of Concepción del Oro approximately 15 km to the town of Mazapil and then a further 12 km west from Mazapil. The road is very steep immediately west of Concepción del Oro with numerous tight switch-backs. It is either paved or cobbled and maintained to approximately 6 km west of Mazapil. After that, the road is gravel but well maintained. The Chile Colorado deposit is within 2 km of this main road and the Peñasco deposit lies directly beneath the road. Figures 1-4 and 1-5 show the project site plan. A system of gravel roads to the east connects to Cedros and eventually to Torreon and the Torreon/Fresnillo highway.

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Additionally there is one railhead close to the site approximately 100 km to the west. Figure 1-3 shows some of the regional corridors.

The State of Zacatecas is in the process of building a new road east from Mazapil to join Highway 54 approximately 25km south of Concepción del Oro. The road is approximately 70% complete with only about 3.5 km yet to be completed over the mountain pass north of La Laja. This road will provide superior grade and alignment to the old road from Concepción del Oro. However, some minor improvements to this road will be needed on sections already completed to accommodate large construction loads. Use of this new road will eliminate the rather steep switchback sections of cobblestone road just west of Concepción del Oro and the town of Concepción del Oro itself. Final work completion is characterized by 400,000 cubic meters of ripped and blasted rock.

1.7.3 Climate

The climate is generally dry with precipitation being limited for the most part to a rainy season in the months of June and July. Annual precipitation for the area is approximately 700 mm, most of which falls in the rainy season.

Temperatures range between 30 deg C and 20 deg C in the summer and 15 deg C to 0 deg C in the winter. Minera Peñasquito has maintained an automatic weather station in the area since August 2003; however, some data has been lost due to power supply problems.

1.7.4 Surface Rights

Surface rights in the vicinity of the Chile Colorado and Peñasco pits are held by one private individual and three Ejidos. Signatures indicating agreement have been obtained for two of the Ejidos and the private owner.

Glamis currently is in negotiations to finalize surface rights to the land required for the project, assisted by a Mexican legal firm.

An Ejido is a communal ownership of land recognized by the Federal laws in Mexico. While mineral rights are administered by the Federal government through federally issued mining concessions, an Ejido controls surface rights over communal property through a Board of Directors which is headed by a president. An Ejido may also allow individual members of the Ejido to obtain title to specific parcels of land and thus the right to rent or sell the land.

Relations with the Ejidos through the exploration process have been positive.

Negotiations for the high voltage power line right-of-way are in progress.



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The project site is generally flat with a gradual fall of 1.5 – 2.5% to the west. There is adequate space for development of the process facilities and the tailings and waste areas. The tailings disposal will be constructed as a four-sided containment area using mine waste for a starter dam and tailings for raising the embankment. In general, this is a very favorable site for development.

Given the mining experience in the area and the high unemployment rate, there is expected to be an adequate pool of mining personnel available.

#### 1.7.5 Water

By Mexican federal law, water encountered as the result of mining operations (e.g., open pits or underground workings) is available to the mining operation without subscription so long as mining continues. Such water must be purchased in accordance with published Federal rates that are updated annually. Again, although this water must be metered and purchased, it is casual water and as such does not credit against any subscribed amount.

The pits will intercept both the upper alluvial portion of the aquifer and the more massive lower fragmented rock portion of the aquifer.

A study has been conducted to confirm the presence of adequate capacity. Reportedly, such a general study was not previously carried out and as such, by Mexican regulations, the general report was the first step in process. This summary report was prepared for M3 entitled, Study for an Integral Hydrogeological Evaluation of Cedros Aquifer and Adjoining Basins, Mazapil County, Zacatecas. Its analysis concludes that the unsubscribed water availability from the Cedros aquifer is 17.3 million m<sup>3</sup>/year, evaluated according to NOM-011-CNA-2000 which is more than adequate for the project.

This report was submitted to CNA authorities on December 15, 2004 in regional offices of Torreon Coahuila. Within this report Western Silver indicated its intent to apply for water rights. Typically, the multi-department CNA review takes between 8 to 12 months. Upon completion of the review, the report and associated CNA findings are published in the official Diary of the Federation (DOF). During the CNA review for this report, a letter of intent was prepared for a concession to pump up to 10 million m<sup>3</sup>/year to be used for the operation of Peñasquito. This letter was initially transmitted to CNA in April 2005. In subsequent communications, CNA has indicated that it will post the report in 2006. CNA has given preliminary indication that it will permit an allocation of 5 million m<sup>3</sup>/year from this upper portion of the aquifer. Additional drilling is ongoing to support an application for the remaining 5 million m<sup>3</sup>/year to

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support the 50,000 MTPD first line. Additional work will continue to secure rights for the full 100,000 MTPD throughput.

## 1.8 History

The region has a strong tradition of mining going back to the mid 1500 s when silver mining first started in the region and the city of Zacatecas was founded. On a historical note, up until the 19th century, 20% of all silver mined in the world was reportedly mined from the City of Zacatecas Region.

Mining remains active in the State of Zacatecas. M3 has provided Engineering & Procurement and Start Up services for the recent Peñoles Fresnillo expansion as well as the greenfields Peñoles F.Y. Madero project. Both of these ongoing operations have polymetallic ore bodies.

Perhaps of greater interest is the recently mined out Real de Angeles property near the city of Zacatecas. This open pit mine operated from June 1982 to November 1998, averaged 17,000 MTPD ore, and had life-of-mine ore grades of 0.58% lead, 0.9% zinc, 70 grams/tonne of silver and no appreciable gold. Life-of-mine stripping ratio was approximately 5 to 1. Values of metal contained are similar to the Peñasquito deposit, taking into account the gold prevalent at Peñasquito.

Focusing on the Peñasquito project under consideration, some limited exploration of the project area had taken place previously with a short shaft and two shallow drill holes in the 1950 s. However, it was not until 1994 when Kennecott initiated a comprehensive exploration program that the size and potential of the mineralized system were recognized.

Beginning in 1994, Kennecott consolidated the land position and completed extensive geochemical, geophysical and drilling programs to evaluate the area, primarily for large tonnage porphyry copper/skarn deposits.

During 1996, drilling along the southern edge of the Azul pipe resulted in the discovery of the Chile Colorado silver-lead-zinc-gold zone, which was not of interest to Kennecott on a stand-alone basis.

Western Silver acquired 100% of the Peñasquito project from Kennecott in March 1998. The acquisition was driven by the large size of the alteration-mineralization system (in excess of 9 km sq), the two large breccia pipes, the zone of probable economic Ag-Pb-Zn-Au mineralization at Chile Colorado, and numerous untested targets with potential similar to Chile Colorado. During 1998 Western Silver completed nine core holes (3,185 meters) and 13.4 line kilometers of Tensor CSAMT. Most of the work was focused on Chile Colorado and the adjacent Azul breccia pipe.

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During the fourth quarter of 2000, Hochschild completed a 14 hole, 4,601 meter drill program, with 11 holes drilled in the Chile Colorado area. However, they returned Peñasquito to Western Silver after spending more than \$1 million on drilling and land payments. Hochschild decided not to tackle a bulk tonnage target with potentially large capital costs.

In 2002, Western Silver began actively drilling the Peñasquito property. In 2006, Glamis acquired the Peñasquito property from Western Silver.

Section 1.13 has summaries of the drilling effort.

## 1.9 Geological Setting

Figure 1-9 shows the local geology.

The regional geology of the area is well understood and has been extensively mapped. Concepción del Oro lies within the Mexico Geosyncline, a 2.5 km thick series of marine sediments deposited during the Jurassic and Cretaceous Periods and consisting of a 2000 meter thick sequence of carbonaceous and calcareous turbidic siltstones and interbedded sandstones underlain by a 1200 meter thick limestone sequence.

The two sierras in the area are separated in the western half of the district by the Mazapil Valley which is a synclinal valley underlain by the Upper Cretaceous Caracol Formation. The Caracol siltstone-sandstone section is generally flat lying in the valley with occasional small parasitic anticlines and drag folds along faults.

The local geology is dominated almost entirely by the rocks of the Mexico Geosyncline. The oldest rocks in the area are the Upper Jurassic aged limestones and cherts of the Zuloaga Limestone.

These rocks are overlain by the La Caja Formation, a series of thinly bedded phosphatic cherts and silty to sandy limestones that may be fossiliferous.

The La Caja Formation is overlain by the limestones and argillaceous limestones of the Taraises Formation, which in turn are overlain by the limestones of the Cupido Formation, one of the more favorable host rock units for much of the mineralization previously mined in the area.

The Cupido limestones are overlain by the cherty limestones of the La Pena Formation, deposited during the Lower Cretaceous Period. These rocks are in turn overlain by the Cuesta del Cura limestone.

The Indidura Formation, a series of shales, calcareous siltstones and argillaceous limestones, overlies the Cuesta del Cura limestone.

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Upper Cretaceous Period rocks of the Caracol Formation, consisting primarily of interbedded shales and sandstones, overlie the Indidura Formation. These rocks dominate the geology in the Peñasquito Project area and are overlain by the Tertiary aged Mazapil Conglomerate.

A large granodiorite stock is believed to underlie the entire area and the sediments described above are cut by numerous intrusive dykes, sills and stocks of intermediate to felsic composition. The intrusives are interpreted to have been emplaced from the late Eocene to mid-Oligocene Epochs and have been dated at 30-40 million years in age.

### 1.10 Deposit Types And Mineralization

Both the Caracol sediments and the granodiorite are believed to have been intruded along the western and southern margins of the granodiorite by one or two quartz-feldspar porphyry stocks. The porphyry stocks did not reach surface but are at depth. They are represented at the bedrock surface by two hydrothermal diatreme breccia pipes, the Azul and Outcrop breccia pipes. There is a single outcrop of silicified breccia of the Outcrop breccia, the *Peñasco*. It is the only outcrop on the property.

Both breccia pipes are believed to have erupted and breached the surface. Their eruption craters and ejecta aprons have since been eroded away, and the current bedrock surface at Peñasquito is estimated to be on the order of 50-75 meters below the paleo-eruption surface. Both of the breccia pipes sit within a hydrothermal alteration shell of propylitic alteration that has largely been overprinted by weak phyllic alteration that intensifies at depth.

### 1.11 Mineralization

Sulphide mineralization occurs in the Chile Colorado deposit, in the Peñasco deposit hosted in the Outcrop breccia, in the Luna Azul and Azul NE deposits hosted in the Azul Breccia, and at other smaller targets on the Peñasquito project. Exploration drilling has recently focused on the large Peñasco deposit.

The Peñasco deposit is in the east half of the Outcrop breccia directly above the projected throat of the breccia pipe. In plan view, it is ovoid in shape, at least 500 meters wide in an east direction and 1000 meters long in a north direction, and has formed around a complex series of small quartz-porphyry stocks and dikes with some felsite dikes. It is composed of disseminations and veinlets of medium to coarse-grained sphalerite-galena-argentite, other unidentified silver sulfosalts, minor tetrahedrite-polybasite and common gangue of calcite-rhodochrosite-quartz-fluorite.

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The intrusive rocks themselves are also often mineralized. Mineralization also extends upwards along the north and south contacts of the Outcrop breccia. At the south contact, it extends upwards in the mixed clast breccia adjacent to the northwest faults that cut the breccia pipe.

The most common mineral host is the intrusive hydrothermal breccia. This breccia is the dominant rock below the 1,600-meter level. It also is widely distributed as a halo around the porphyry stocks and dikes. The porphyry often appears to brecciate into the intrusive hydrothermal breccia as it passes upwards. Mineralization is present in the upper mixed clast breccia along the south contact, the quartz-feldspar porphyry intrusive breccia and, to a lesser extent, the quartz-porphyry dikes. The felsite dikes are at times also good mineral hosts.

The Chile Colorado Ag-Zn-Pb mineralization normally occurs as both veining and narrow fracture filling, hosted in weakly silicified sandstone, siltstone or shale. The mineralization has been interpreted to represent stockworks, localized by a north-south trending fracture zone, extending south from the Azul diatreme.

Sphalerite and galena associated with carbonate and pyrite occur as massive veins. Pyrite, sphalerite and galena have also been observed as discrete crystals and disseminations within sandstone units. Late state carbonates and pyrite fracture fillings occur throughout the sediments.

## 1.12 Exploration

Kennecott completed numerous air and ground based geophysical surveys on the Peñasquito claim groups between 1994 and 1997. The aeromagnetic survey of the region defined an 8 km x 4 km, N-S trending magnetic high centered roughly on the Outcrop Breccia. These surveys provided coverage of the area including the Peñasco zone and confirmed the area as a suitable target for drilling.

In 2004, Western Silver initiated additional CSAMT and IP surveys that extended coverage on the older lines, and extended coverage to the east of the pre-existing coverage. The geophysical database for the Peñasquito project area now provides a detailed electric cross-section that images changes in geology, and appears to identify specific targets of interest.

Kennecott completed an extensive rapid air blast ( RAB ) drilling campaign across much the Peñasquito project area after the discovery of the Chile Colorado deposit. This program, designed to systematically test the entire project area, consisted of 250 holes. The holes penetrated the extensive overburden cover and collected chip samples from anomalies, which had been discovered during the numerous geophysical surveys as well as outlining other, previously unknown anomalies. Twenty-eight of the RAB holes in this campaign by Kennecott were drilled within and immediately adjacent to the Peñasco zone breccia pipe. The

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geochemical survey results indicated that further exploration was warranted in this area. Exploration drilling results have subsequently confirmed significant mineralization in the Peñasco zone.

**1.13 Drilling**

Drilling at the Peñasquito property has focused on the exploration of three principal areas: Chile Colorado, Azul (Azul Breccia, Azul NE and Luna Azul) and Peñasco including El Sotol adjacent to Peñasco (Figures 1-10A and 1-10B). Work is presently concentrated on both in-fill and step-out exploration drilling of the Peñasco zone.

The Peñasquito property has been drilled by different operators over several campaigns and phases beginning in 1995 under Minera Kennecott S.A. de C.V.

The following tables summarize exploration drilling performed and assayed to date on the Peñasquito property. This data has been used in the preparation of the resource estimates used in this report.

The summaries of the drilling through Campaign 17 are in Tables 1-8, 1-9, and 1-10. Additional extensive drilling is ongoing.

**Table 1-8 Summary of Project Drilling at Peñasquito Through Campaign 17**

<b>HOLE PURPOSE</b>	<b>TOTAL DRILL HOLES</b>	
	<b>Number</b>	<b>Meters</b>
Resource Estimate Peñasco & El Sotol	328	175,500
Resource Estimate Chile Colorado & Azul	122	48,900
Subtotal Holes Used for Resource Estimate <sup>(1)</sup>	450	224,400
Chile Colorado Hochschild Holes Excluded for Resource Estimate	14	4,601
Condemnation	11	4,559
Metallurgy	13	4,016
Pit Geotechnical	11	4,126
Outside Exploration	29	7,721
<b>Total</b>	<b>528</b>	<b>249,423</b>

(1) 15,135 meters are reverse circulation drilling; the balance is core.

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**Table 1-9 Summary of Exploration Drilling Campaigns at Peñasquito\***

<b>Campaign</b>	<b>Period</b>	<b>Drilling Type</b>	<b>Hole IDs</b>	<b>Number of Drill Holes</b>	<b>Meters of Drilling</b>	<b>Average Hole Length (m)</b>
Kennecott	1994-1997	Reverse Circulation & Diamond Drilling	PN01 - PN71	71	23,929	337
Western Copper	1998	Diamond Drilling	WC01 - WC09	9	3,185	354
Mauricio	2000	Diamond Drilling	MHC01 - MHC14	14	4,601	329
Hochschild						
Western Copper	2002	Diamond Drilling	WC10 - WC54	45	19,795	440
Western Copper	2003	Reverse Circulation Diamond Drilling	S01 - S57 S09Ext*,S24Ext*,S30Ext*	51	12,090	237
Western Copper	2003	Diamond Drilling	WC55 - WC100 WC67A, PN26Ext* WC53Ext**	48	14,605	304
Western Silver Phase 9	2004	Diamond Drilling	WC101 - WC130	31	14,842	479
			WC119A			
Western Silver Phase 10	2004	Diamond Drilling	WC131 - WC179 WC131A,WC137A WC138A,WC146A WC150A,WC154A WC156A	56	20,241	361
Western Silver Phase 11	2004	Diamond Drilling	WC180 - WC211 WC99Ext**, WC189A	33	21,968	666
Western Silver Phase 12	2005	Diamond Drilling	WC212 - WC227	16	11,460	716
Western Silver Phase 13	2005	Diamond Drilling	WC228 - WC256	32	21,005	656
Western Silver Phase 14	2005	Diamond Drilling	WC257 - WC278	22	14,226	647
Western Silver Phase 15	2005	Diamond Drilling	WC279 WC309	31	19,601	632
Western Silver Phase 16	2005	Diamond Drilling	WC310 WC346	37	24,928	674
Western Silver Phase 17	2006	Diamond Drilling	WC347 WC377	32	22,944	717
Totals				528	249,420	472

\* - Feasibility  
Study grade

modeling  
excludes all  
MHC drilling,  
WC277, the  
latter part of  
WC276.

Ext\*- diamond  
drill extension  
of reverse  
circulation hole

Ext\*\*- diamond  
drill extension  
of diamond drill  
hole

**Table 1-10 Summary of Drilling Activity at the Peñasquito Property**

<b>Calendar Year</b>	<b>Number of Drill Holes</b>	<b>Meters of Drilling</b>	<b>Average Hole Length (m)</b>
1994-1997 Drilling	71	23,929	337
1998 Drilling	9	3,185	354
2000 Drilling	14	4,601	329
2002 Drilling	45	19,795	440
2003 Drilling	99	26,695	270
2004 Drilling	120	57,051	475
2005 Drilling	138	91,220	661
2006 Drilling to June 30	32	22,944	717
<b>Drilling Total</b>	<b>528</b>	<b>249,420</b>	<b>473</b>

1-35



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#### **1.14 Sampling Method And Approach**

Due to the alluvial cover at Peñasquito, the vast majority of resource sampling has been done using either reverse circulation or diamond core drilling. All drilling in 2004 and most other drilling has been primarily HQ size core drilling, but narrowing to NQ diameter at depth in the longer holes.

Minera Peñasquito reports that it samples drill holes from bedrock to final depth. The standard sample interval is 2.0 meters. Some samples are limited to geological boundaries and are less than 2.0 meters in length. A senior geologist examines the core, defines the primary sample contacts, and designates the axis along which to cut the core. Special attention in veined areas is taken to ensure representative splits are made perpendicular and not parallel to veins.

Geological logging is very detailed and follows the geological legend on a regional scale. Once the core has been measured, marked, photographed, and logged geotechnically and geologically the core boxes are brought to the diamond saw cutting stations. The core is sawed in half. One-half of every sample is placed into a heavy plastic bag. The Splitter's Helper has previously marked the drill hole and sample number on the plastic bag and inserted the relative sample tag in the plastic bag.

Standard Reference Material samples and blanks are inserted into the sample stream going to the assay laboratory in a documented sequence on a frequency of approximately 1 in 20 samples.

A Minera Peñasquito truck transports the sacks to the ALS Chemex laboratories in Guadalajara approximately once per week, where the samples are prepped and pulped. Pulps are sent to ALS Chemex labs in Vancouver where they are assayed and checked. At present ALS Chemex is Minera Peñasquito's primary assay lab. Check samples are sent to Acme Labs of Vancouver.

The sample preparation procedures on site prior to shipment to the laboratory have been independently reviewed and deemed secure and adequate.

An independent sampling, preparation and assaying audit has not been performed.

#### **1.15 Sample Preparation And Analyses And Security**

The quality assurance and quality control procedures employed by Minera Peñasquito ( QA/QC ) have been independently reviewed and no significant concerns noted. Approximately 90% of the data base assays were run on Minera Peñasquito samples, and Minera Peñasquito generally used ALS Chemex as the primary lab and Acme as the check lab. Both Chemex and Acme are ISO9002-certified. Both labs use industry standard sample preparation procedures.

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No independent samples have been taken and assayed, but comparisons between Minera Peñasquito and Kennecott drilling results show no biases (see Section 1.16).

The samples assayed are under the control of Minera Peñasquito or either ALS Chemex or Acme as described in Section 1.14.

### **1.16 Data Verification**

Based on a review of Minera Peñasquito's sample preparation, analysis, security, and QA/QC procedures to date with respect to database verification, the database used for the resource estimates is deemed to be accurately compiled and maintained, and is suitable for use in mineral resource estimation.

No significant problems were identified during reviews of the drilling data. The holes appear to have been properly located and downhole-surveyed and to have recovered an adequate sample (core recovery during the later Minera Peñasquito campaigns averaged 97.8%).

Almost all of the drilled intervals are assayed for gold, silver, lead and zinc. The average assay interval is slightly over 2 m. Approximately 90% of the data base assays were run on Minera Peñasquito samples, and Minera Peñasquito generally used ALS Chemex as the primary lab and Acme as the check lab. Both Chemex and Acme are ISO9002-certified. Data entry errors should be minimal because IMC re-compiled the bulk of the assay data base directly from the original lab's electronic files of assay certificates.

Several thousand gold, silver, lead and zinc check assays run by a check laboratory (usually Acme) on pulps prepared by the primary laboratory that ran the data base assays (usually Chemex) are available for the Kennecott campaign and for Minera Peñasquito Phases 1, 2, 3, 5, 6, 7, 8, 9, 10 and 11. These assays act as a check on the analytical procedures used by the primary lab. A few hundred gold, silver, lead and zinc assays run by a check lab (Acme, M3/Hazen Research or Davis Metallurgical Laboratories) on fresh pulps prepared by the check lab are available for Minera Peñasquito Phases 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, and 14. These assays act as a check on both the analytical and the sample preparation procedures used by the primary lab. No check assays are available for the Hochschild, 1998 and Minera Peñasquito Phase 4 campaigns, and as of the time of writing the check assaying for Minera Peñasquito Phases 15, 16, and 17 was in progress.

The check assay comparisons show generally acceptable overall agreement between the primary and check labs for all of the campaigns/phases for which check assays are available. Standard and blank assaying results also appear to be generally acceptable. There are indications that some of the data base silver

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assays run by Chemex during the later Minera Peñasquito phases may be biased 5-15% low as a result of analytical factors, but this bias cannot presently be confirmed, and the errors introduced into NSR value estimates would be minimal even if it did exist.

IMC supplemented the check assay data by performing numerous paired comparisons of grades from different drilling and assaying campaigns, including those for which no check assays are available. The results show no evidence to indicate that any of the Minera Peñasquito and Kennecott data base assays are affected by large analytical or sample preparation biases. However, they do suggest that the Hochschild grades are quite heavily high-biased relative to the Kennecott and Minera Peñasquito grades for gold, silver, and zinc. No Hochschild samples were available for re-assay, so the precautionary decision was taken not to use the Hochschild assays when estimating grades in the model.

The paired-comparison reviews did not detect any biases between core and reverse circulation drilling. (About 10% of the exploration drilling is RC.)

No significant problems were identified with other data supplied to IMC, which included sulfur assays (used to define oxidized zones) and lithology, alteration, and oxidation data base codings. Drill logs were of excellent quality. Density data were obtained from core sample measurements and the values are reasonable relative to sample lithology.

### **1.17 Adjacent Properties**

There are no adjacent properties from which exploration and/or mining activities would lead to better understanding of the Chile Colorado or Peñasco open pit deposits.

The Tayahua underground mine operates in the foothills to the northeast of the Peñasquito property. This is a polymetallic zoned Cu-Pb-Zn-Ag-Au skarn ore body hosted in carbonates adjacent to a quartz monzonite intrusion. As such, it might become of interest as Glamis pursues its potential underground deposit beneath the Peñasco Pit.

### **1.18 Mineral Processing And Metallurgical Testing**

Metallurgical test work initiated since the 2004 Pre-feasibility Study was completed includes: comminution testing, flotation testing, modal analyses, and gravity testing, all for the sulphide process. For the oxide process, bottle roll and column leach tests have been performed. Additional work is in progress for both the sulphide and oxide mineralization. Samples from both Chile Colorado and the Peñasco areas are being tested. Most of the work now in progress and planned for

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the near future utilizes metallurgical diamond drill hole (DDH) samples produced in late 2004 and early 2005. A program consisting of 13 DDHs was completed in February 2005. The program produced approximately 3,400 meters of PQ (83 mm) and 600 meters of HQ (64 mm diameter). The core from the sulphide zone was shrink-wrapped to prevent oxidation. Crushed sulphide samples are also being stored in freezers until they can be tested. Additionally, bulk samples for run-of-mine testing of the oxide ore were extracted from four hand-dug wells in the Peñasco deposit.

The following tests have been run on Chile Colorado and Peñasco ores. This program has been used to determine the recoveries employed in this study.

**Table 1-11 Summary of Metallurgical Testing**

<b>Sulphide Tests</b>		<b>Peñasquito Process Development Tests 2004-2006</b>		<b>Oxide Tests</b>	
Flotation Tests	280				
Comminution Tests	73	Bottle Rolls		47	
Process Mineralogy	13	Column		46	
Leach	5	Small Column		42	
Settling	27	Intermediate Column		1	
Pulp Rheology	8	Large Column		3	
Filtration	4	Miscellaneous		6	
Analyses	2				
Pilot Plant	1				
Tailing Cyclone Test	2				
<b>Total Number of Tests</b>	<b>368</b>	<b>Total Number of Tests</b>	<b>99</b>	<b>=&gt;</b>	<b>467</b>

## 1.18.1 Sulphide Metallurgical Testing

Comminution test work was performed on 19 samples from the Chile Colorado deposit and 24 samples from the Peñasco deposit. During the first quarter of 2006 an additional 49 samples from Peñasco were tested, making a total of 73 Peñasco samples tested. The tests were performed by Minnovex of Toronto, and included the SAG Power Index (SPI), Crusher Index (CI), and the Minnovex Modified Bond Work Index (WI). Three full Bond Work Index determinations were also performed to calibrate the modified procedure, Progressive Grinding Circuit Design for the Western Silver Peñasquito Project, Minnovex Technologies, Inc., June 2005. Using data from these tests and additional input parameters provided by M3, Minnovex used their proprietary grinding circuit simulation program, CEET, to estimate mill sizes. The CEET data were used by mill vendors to recommend sizing as follows:

SAG mill: One mill @ 18,690 kW, 11.6 m x 6.1 m (38' x 20')

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Ball Mill: Two mills @ 14,317 kW each, 7.6 m x 10.4 m (25' x 34.5')

Pebble Crusher: One @ 600 kW, 2.4 m (8') (For this report M3 has selected one MP800 crusher.)

Tests were also performed by SGS Lakefield using the JK Tech drop-weight test method. The JKSimMet simulation method was used to estimate mill sizing, which generally agreed with the Minnovex results.

The primary crusher was sized from the 2004 test work and the required capacity of 100,000 MTPD of Peñasco ore. The crusher is a gyratory type, 1524 mm x 2870 mm (60' x 113') in size.

Following completion of the pre-feasibility test work, a new campaign of flotation test work was performed in two laboratories, Dawson Metallurgical Laboratories in Salt Lake City and G&T Laboratories in Kamloops BC. In total these test programs resulted in 24 variability scheme tests on Chile Colorado and 34 tests on Peñasco ore. A further 40 tests, approximately, were performed to examine the grind-grade-recovery relationship and to improve the reagent scheme from that developed for the 2004 Pre-Feasibility Study.

Since the Feasibility Study work, five flotation tests have been conducted on Chile Colorado ore including one locked cycle test, and four tests in which dextrin was tested as a carbon depressant. The Peñasco ore has had an additional fifty-six flotation tests, which include 51 variability tests, four locked cycle tests on specific lithology composites, and a large scale locked cycle test to produce concentrates for dewatering tests.

Locked cycle tests on ore from both deposits were performed as part of the flotation test program in order to provide a basis for the projected plant recoveries. These tests revealed that recoveries in the Peñasco Pit correlated with three basic ore categories: breccia, intrusive and sedimentary. Recoveries in the Chile Colorado tests have not yet revealed an obvious correlation. Work is ongoing to determine if any correlation exists and to improve recoveries. Based on the most recent results, the following metallurgical data has been used for flow sheet development.

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**Table 1-12 Projections of Concentrate Grades and Recoveries****MINE HEAD GRADES**

<b>Resource Category</b>	<b>Tonnes</b>	<b>Au</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>
Peñasco Intrusive	42,147,000	0.78 g/t	25.1 g/t	0.24%	0.54%
Peñasco Breccia	328,260,000	0.64	32.7	0.34	0.77
Peñasco Sedimentary	58,141,000	0.56	27.3	0.30	0.70
Chile Colorado	48,414,000	0.29	50.1	0.56	0.96

**LEAD CONCENTRATES**

<b>Resource Category</b>	<b>Grades</b>				<b>Recoveries</b>			
	<b>Au</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>	<b>Au</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>
Peñasco Breccia	40 g/t	3,250 g/t	52%	5%	66%	65%	75%	4%
Peñasco Intrusive	72	2,600	51	8	65	63	72	5
Peñasco Sedimentary	15	2,500	45	15	25	40	60	10
Chile Colorado	8	3,050	50	5	20	58	63	4

**ZINC CONCENTRATES**

<b>Resource Category</b>	<b>Grades</b>				<b>Recoveries</b>			
	<b>Au</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>	<b>Au</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>
Peñasco Breccia	5 g/t	220 g/t	2%	50%	14%	16%	4%	78%
Peñasco Intrusive	7	350	4	50	12	16	10	60
Peñasco Sedimentary	3	450	4	50	10	10	12	50
Chile Colorado	0.8	360	1	55	7	13	4	60

In the first part of 2006 more tests have been carried out on the Peñasco ore. There have been nine new settling, eight Pulp Rheology, and four filtration tests. All of these tests are described in the report, Flocculant Screening, Gravity Sedimentation, Pulp Rheology, Pressure Filtration, and Vacuum Filtration, prepared by Pocock Industrial, Inc., Salt Lake City, dated May 2006.

A small scale pilot plant test was performed on samples of the Peñasco ore. The plant capacity was approximately 100 kg/hr and was run intermittently over a period of four days. The purpose of the run was to provide concentrate samples for smelter testing as well as tailing samples for geotechnical and environmental testing. Due to the low grade of the ore relative to the size of the pilot plant equipment and the short duration of the test it was not possible to optimize test conditions. The lead first and second cleaners were operated in a locked cycle mode and the zinc concentrate was re-cleaned in the laboratory after the pilot plant run. The pilot plant generally confirmed that the recoveries predicted by locked cycle testing were achievable at larger scale and yielded approximately 9 kg of zinc concentrate and 7 kg of lead concentrate.

Modal analyses and liberation analyses were also performed to support the test work through a better understanding of the mineralogy and liberation characteristics of the samples.

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One small scale gravity test was performed on a sample from Peñasco, high in gold and silver. The test products were assayed and evaluated using an Automated Digital Imaging System (ADIS.) The results indicated that any free gold occurs as particles finer than about 10 microns, meaning gravity recovery of gold is not likely to be successful.

An ADIS analysis of the occurrence of gold in the rougher and cleaner tailing from a locked cycle test on a sample from the Peñasco deposit revealed very little visible gold in either product. In the rougher tailing 275 slides, approximately  $30 \times 10^6$  particles, were examined, and only four gold particles were found at an average mean diameter of 7.2 microns. In the cleaner tailing examination of 75 slides,  $11 \times 10^6$  particles, found 3 particles with an average mean diameter of 15.4 microns.

A gold model was constructed using multiple regression techniques on the locked cycle test products. These results suggest that, for Peñasco the gold and silver track galena in the flotation process. A small amount of the silver tracks sphalerite. For Chile Colorado most of the gold tends to track pyrite, with a small fraction behaving like copper sulphide and galena. Most of the silver tends to track copper sulphide and galena.

#### 1.18.2 Sulphide Process Plant

The process plant selected for the project is conventional. Figure 1-6 outlines the plant. The following is a simplified process description for the sulphide ore process:

Run-of-mine ore is discharged from haul trucks into the crusher pocket.

The crusher is a single 60 x 113 (1524 x 2870 mm) gyratory crusher.

Crusher product is conveyed to a 91,700 tonne live capacity stockpile (45,850 tonne per line).

Crushed ore from the stockpile will be reclaimed via five variable speed belt feeders per line located in the reclaim tunnel.

Ore from the stockpile will be conveyed to a one SAG mill/two ball mill circuit designed to produce an average of 50,000 MTPD of Peñasco ore or 40,000 MTPD of Chile Colorado ore at 80% passing 125 micron.

One pebble crusher in closed circuit with the SAG mill will crush pebbles to minus 19 mm and return the material to the SAG mill feed conveyor.

The slurry from the grinding circuit will first pass to the lead flotation circuit.

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Lead flotation consists of two banks of five each rougher flotation cells in parallel followed by regrinding and three stages of cleaner flotation cells.

The first cell of each row in the lead flotation circuit may be used for carbon pre-float when treating carbonaceous ore from Chile Colorado. Space will be provided to install carbon cleaner flotation cell when needed.

The zinc flotation circuit consists of two banks of five each rougher flotation cells in parallel followed by regrinding and three stages of cleaner cells.

Concentrate from the lead and zinc circuits will be pumped to respective thickeners followed by pressure filters.

Concentrate filter cake from the pressure filters will be discharged to stockpiles from which the material will be reclaimed by loader and loaded onto highway trucks for transport to rail, port, or smelter.

### 1.18.3 Oxide Metallurgical Testing

Preliminary metallurgical testing of oxide ore has been performed. Process flow sheets were developed based on results of the test work. All test work on oxide ore to date has been completed by METCON, Research located in Tucson, Arizona.

Initial testing of the oxide ore was performed by means of bottle roll tests. A total of 13 bottle roll tests, of 72 hour duration, were performed using coarse reject material supplied from the Chemex sample preparation facilities in Guadalajara. The samples originated from the Peñasco Deposit diamond drill samples (DDH WC-102 from 16 to 68 m and DDH WC-108, Intervals from 16 to 80 m, downhole.) Test results indicated that the ore leached well with expected reagent consumptions.

Based on the results of the bottle roll tests two column leach tests were performed using the same original samples, but composited into shallow and deep fractions. The tests were performed by agglomerating the ore and curing with cyanide, lime, and Portland cement. These tests are described in Peñasquito Project Preliminary Cyanide Leach Tests, METCON Research Inc., December 2004.

A second series of bottle roll and column leach tests was completed on six trench samples taken from old dump sites in the Peñasco ore. One bottle roll test was done on each sample (six total). Two column leach tests were done on each sample at different crush sizes (P80=38 mm & P80=9.5 mm) to determine affect of size on recovery and reagent consumption. One bottle roll and one column leach test was completed on a seventh dump



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sample. This column test was run at as received size to determine impact to recovery with no crushing.

A third series of 21 bottle roll and 17 column leach tests were completed using the metallurgical DDH samples. Four of the column tests were run on Chile Colorado ore and 13 of the column tests were run on Peñasco ore. All columns were run on ore that was crushed to 38 mm.

A fourth series of tests, six bottle roll and six column leach, were completed on bulk samples taken from three wells in the Peñasco area. Two column leach tests were done on each sample, one at estimated run-of-mine (ROM) size and one at 38 mm. Results from these tests were used to develop the flow sheets, as well as estimates of extraction and cyanide and lime consumption for this study.

Because of the extremely high ratio of Ag to Au, the Merrill-Crowe (zinc precipitation) process was selected over the carbon adsorption method of recovering the precious metals from solution.

The recoveries for silver and gold from the heap leach are presently estimated for: 1) Peñasco oxide and mixed ores, gold 50%, silver 28%; and 2) Chile Colorado oxide and mixed ores, gold 50%, silver 22%.

#### 1.18.4 Oxide Process Plant

The following is a simplified process description for the oxide ore:

ROM ore is discharged from haul trucks onto a heap leach pile.

Lime is added to the ROM ore prior to being placed on the pad. The ore is placed in 10 m lifts.

The ore is leached with cyanide solution.

The pregnant leach solution is clarified, filtered, and de-aerated, then treated with zinc dust to precipitate the precious metals.

The precipitated metals are then pressure filtered.

The resulting filter cake is smelted to doré.

### 1.19 Mineral Resource And Mineral Reserve Estimates

#### Mineral Resource Estimate

Mineral resources for Chile Colorado and the Peñasco zones were calculated by Glamis and were classified according to the CIM Standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council November 14, 2004. A number of elements that represent the confidence in the

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geological interpretation, the database integrity, the spatial continuity of mineralization and the quality of estimation were utilized in the classification.

The model used for the Chile Colorado and Azul deposits in this report is the IMC March 2005 model based on drill hole information through the Phase 12 drilling completed in early 2005. No significant additional drilling has been done in this area after Phase 12. Thirteen Hochschild holes in the Chile Colorado area were not used in the modeling process as the assay values from these holes are inexplicably biased high. In addition, five Phase 13 and 14 holes (WC254, 261, 267, 272 and 275) and ten Phases 15 and 16 holes (WC281, 283, 287, 291, 295, 299, 302, 307, and 311), drilled after the model was completed in March 2005 were not used in the modeling process simply due to time constraints.

Since no additional drilling data or geologic interpretation of the Chile Colorado Azul deposit was considered, Glamis continued use of the IMC March 2005 model data for Chile Colorado resource and reserve calculations. However, it was not used directly as it was a 10 m bench based model. The 10 m model was mathematically converted from a 10 m bench to a 15 m bench height with every other bench being split and its values combined with the adjoining 10 m bench. Glamis then calculated updated Chile Colorado NSR values using more recent metal prices and metallurgical recovery factors.

The Chile Colorado Azul resource is based on a computer block model with a block size of 20 m by 20 m in plan and 15 m high. The silver, gold, lead and zinc grade are estimated into the model from 10 m composites of the drill data using ordinary kriging with a 135 m maximum spherical search. Geologic information (lithology, alteration and oxidization) are assigned to the model using a nearest neighbor approach from the drill hole composite data. Density values are based on test work on core samples and are assigned to the model based on the oxidization and lithology assignments: overburden, 2.20; oxide (all lithologies), 2.40; mixed (all lithologies), 2.475; sulphide, Caracol sediments, 2.60; sulphide, Azul breccia units, 2.50.

The model used for the Peñasco deposit is a Glamis June 2006 model developed from drill hole information through drill Phase 17. The Peñasco computer block model has a block size of 20 m by 20 m in plan and 15 m high. The silver, gold, lead and zinc grade are estimated into the model from 15 m composites of the drill data using ordinary kriging. The spherical search kriging used composites and blocks contained within a geologically defined mineralized grade domain. The grade domain and geologic information (lithology, alteration and oxidization) are assigned to the model using cross sectional based 3-Dimensional solids. Density values are based on test work on core samples and are assigned to the model based on the oxidization and lithology assignments: overburden, 2.20; oxide (all lithologies), 2.30; mixed (all lithologies), 2.40; sulphide, Caracol sediments, 2.60; sulphide, breccia units, 2.50.

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For both deposits, an NSR value for the sulphide, mixed and oxide materials was calculated using input data on costs and recoveries updated as of June 2006. A flotation mill process is assumed for the sulphide material with an Internal NSR Cut-Off calculated at \$3.60 for Peñasco and \$4.18 for Chile Colorado. A run-of-mine (ROM) heap leach for gold and silver is assumed for the oxide and mixed materials with an internal cut-off calculated at \$1.30 NSR.

The classification of the resources is based on the following criteria:

Chile Colorado Azul Deposits

Within 135 m of 5 or more holes and within 40 m of closest hole:	Measured
Within 135 m of 2 to 4 holes and within 50 m of the closest hole:	Indicated
Within 135 m of one hole:	Inferred

Peñasco Deposit

Within 35 m of 2 or more holes:	Measured
Within 36 m to 70 m of 2 or more holes:	Indicated
Greater than 70 m of one hole:	Inferred

In addition, Measured and Inferred Resources are further constrained to be only those blocks of the model that are within an optimized open pit geometry defined by reasonable long term metals prices.

Constraints are much tighter at Peñasco because primary variogram ranges here are much shorter than at Chile Colorado/Azul (70 m versus 210 m), indicating lower grade continuity in the Peñasco deposit.

The grade of the block was not used as a determinant in resource classification.

Table 1-13 summarizes the Peñasquito resources by measured plus indicated (M&I) classifications. The M&I resource is within a geometry defined by reasonably foreseeable metal prices of: \$650 per ounce gold; \$10.00 per ounce silver; \$0.86 per pound zinc and \$0.43 per pound lead. This geometry bounds an M & I resource with reasonable expectation of potential extraction by open pit mining. In addition, the M & I resources meet the distance and sample density requirements stated above. The tabulation of M & I resources used NSR values based on the stated long-term metal prices.

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**Table 1-13 Estimated Measured Plus Indicated Resources by Open Pit**

	<b>Internal NSR Cut-off</b>	<b>Million Tonnes</b>	<b>Silver g/t</b>	<b>Gold, g/t</b>	<b>Lead %</b>	<b>Zinc %</b>
Sulphide, Peñasco	\$3.60	505.9	30.1	0.62	0.31	0.71
Sulphide, Chile Colorado	\$3.60	242.3	31.7	0.23	0.35	0.73
Combined Sulphide		748.2	30.6	0.49	0.32	0.71
Oxide/Mixed, Peñasco	\$1.30	74.7	24.0	0.29		
Oxide/Mixed, Chile Colorado	\$1.30	49.6	17.4	0.17		
Combined Oxide/Mixed		124.3	21.4	0.24		
Combined Types Peñasco		580.5	29.3	0.57	0.31	0.71
Combined Types Chile Colorado		291.9	29.3	0.22	0.35	0.73
Combined Types All Deposits		872.5	29.3	0.46	0.32	0.71

Table 1-14 summarizes the Peñasquito resources by inferred classification. These inferred resources are outside any defined pit geometry and are within the geologically defined mineralized grade domain.

**Table 1-14 Estimated Inferred Resources**

	<b>Internal NSR Cut off</b>	<b>Million Tonnes</b>	<b>Silver g/t</b>	<b>Gold, g/t</b>	<b>Lead %</b>	<b>Zinc %</b>
Sulphide, Peñasco	\$1.60	1,041.7	14.5	0.28	0.13	0.38
Sulphide, Chile Colorado	\$1.60	1,362.9	8.3	0.10	0.08	0.23
Combined Sulphide		2,404.6	11.0	0.18	0.10	0.29
Oxide/Mixed, Peñasco	\$0.70	22.9	10.7	0.14	0.13	0.38
Oxide/Mixed, Chile Colorado	\$0.70	149.1	5.0	0.06		
Combined Oxide/Mixed		172.0	5.7	0.07		
Combined Types Peñasco		1,064.6	14.4	0.28	0.13	0.38
Combined Types Chile Colorado		1,512.0	8.0	0.10	0.08	0.23
Combined Types All Deposits		2,576.6	10.6	0.17	0.10	0.29

Mineral Reserve Estimate (for Sulphides, Mixed and Oxides)

The proven and probable reserves for the Chile Colorado and Peñasco deposit are contained within an engineered pit design based on a floating cone analysis of the resource block model using the measured and indicated resources.

Proven and probable reserves are derived from measured and indicated resources respectively that fall within the pit boundary. The figures obtained for metallurgical recovery, revenue and costs were combined to assign NSR figures for each block in the resource model. The NSR values assigned to the block models for the purpose of developing the

reserve pit geometry are based on lower metal prices than those used to tabulate the resources described above. The prices used for the

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development of the reserve pit geometry were \$450/oz Au, \$7.00/oz Ag, \$0.30/lb Pb and \$0.60/lb Zn.

Based on the calculated operating costs from previous studies and an overall pit slope angles based on earlier pit designs and geotechnical studies, a number of theoretical pit shell runs were calculated. The final pit shell in both deposits was based on a \$0.80/tonne mining cost for rock and overburden, an additional mine cost of \$0.01 per bench of depth below the 1980 elevation to both ore and waste and a discount rate of 1% per bench. Overall slope angles ranged from 39° to 46° in Peñasco and 37° to 44° in Chile Colorado Azul. The floating cone runs did generate a pit shell in the Azul and El Sotol deposits, but for this study they were not included in the reserve or mine production schedule.

The reserve summary is the sum of a mine production schedule using the proven and probable tonnages from the two ultimate pit designs. The sulphide material reports to a flotation mill and the oxide plus mixed material reports to a run-of-mine, heap leach. The NSR values used to tabulate the reserves within the final pits are based on metal prices of: \$450/oz Au, \$7.00/oz Ag, \$0.30/lb Pb and \$0.60/lb Zn

**Table 1-15 Peñasquito Project Open Pit Reserve Summary**

		Grades				
		Ktonnes	Au, g/t	Ag, g/t	Pb, %	Zn, %
<b>Sulphides: Mill Ore (1)</b>						
Chile Colorado	Proven	46,700	0.29	50.9	0.56	0.97
Peñasco	Proven	221,200	0.67	32.2	0.35	0.77
Total, Proven Pit Reserve		267,900	0.60	35.4	0.38	0.81
Chile Colorado	Probable	1,700	0.25	28.9	0.34	0.65
Peñasco	Probable	207,300	0.60	30.2	0.31	0.70
Total, Probable Pit Reserve		209,000	0.60	30.2	0.31	0.70
<b>Mill Ore, Combined Proven and Probable</b>		<b>476,900</b>	<b>0.60</b>	<b>33.2</b>	<b>0.35</b>	<b>0.76</b>
<b>Oxides + Mixed: Leach ore (2)</b>						
Chile Colorado	Proven	16,700	0.22	20.3		
Peñasco	Proven	51,600	0.28	25.4		
Total, Proven Pit Reserve		68,200	0.27	24.2		
Chile Colorado	Probable	2,200	0.22	14.7		
Peñasco	Probable	16,600	0.35	23.4		
Total, Probable Pit Reserve		18,800	0.33	22.4		
<b>Leach Ore, Combined Proven and Probable</b>		<b>87,100</b>	<b>0.28</b>	<b>23.8</b>		

- 1) Sulphides are reported at a U.S. \$3.60/tonne Internal NSR Cut-off for Peñasco and \$4.18/tonne for Chile Colorado.

- 2) Leach tonnage  
is reported at a  
U.S.  
\$1.30/tonne  
NSR Cut-off.

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## 1.20 Other Relevant Data And Information

### 1.20.1 Geotechnical

#### a) Geotechnical Drilling and Sampling Program for Foundation Design

Initial geotechnical field investigation was performed by Golder Associates to collect the geotechnical data required to support the design of the heap leach facility, waste rock piles, tailings impoundment and process plant. The field investigation was performed from March 2, 2005 to March 23, 2005.

The first-portion of the field investigation included the drilling of thirty-four boreholes within the project site area. The second-portion of the field investigation included excavation of test pits to characterize the superficial foundation and construction materials. This work was performed during late May and early June 2005.

The drilling contractor utilized was Estudios Especializados de Mecánica de Suelos, S.A. de C.V. (EEMSSA) from Monterrey, Nuevo León, Mexico. The contractor used a Foremost Mobil Drill Model B-59 and a CME-55 to perform the drilling.

1.5 m long, 4.50-inch outside diameter (OD) continuous flight augers were used to advance the borehole through the alluvial soil. Standard Penetration Tests (SPT) were performed in each borehole. The SPT used a standard split-spoon sampler with a 2-inch OD; applicable American Society for Testing and Materials (ASTM) D1586 procedures were followed during the testing. Rock coring techniques were also performed with 1.5 m long, NQ size double barrel equipment to collect samples of the rock materials.

The boreholes were logged by geotechnical field technicians. Borehole logs associated with the field investigation, including sample descriptions, SPT blow counts, sample numbers and visual classifications according to the United Soil Classification System (USCS) were prepared.

Additional geotechnical data collection and analysis will be performed at the site as the project advances to final design, e.g., boreholes drilled at final locations of heavy equipment such as mills and crushers.

#### b) Geotechnical Oriented Core Drilling Summary for Pit Slope Stability

Pit slope angles are based on a progression of geotechnical analysis of the Peñasco and Chile Colorado deposits. Several phases of oriented



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core drilling, geotechnical logging and geotechnical modeling have occurred in support of pit slope recommendations over the last several years. This analysis has been detailed in the following 2 reports:

Peñasquito Project, Feasibility Pit Slope Design, prepared by Golder Associates dated July 2005.

Addendum to Peñasquito Project, Feasibility Pit Slope Design, prepared by Golder Associates, dated 24 August 2005.

In June 2006, Golder Associates was asked to review the updated design pits and assess whether the pit slope recommendations that were provided in the 2005 pit slope design reports remain valid for the new designs. The conclusions and recommendations of this recent work were:

The recommendations of pit slope angle for the Chile Colorado Pit are considered to be appropriate.

The recommendations for the Peñasco Pit are unreliable, particularly for the upper bench slopes; four additional oriented core holes are recommended and additional characterization be completed; for purposes of preliminary pit planning, an inter-ramp slope angle in the bedrock units of the Peñasco Pit be limited to 47 degrees for slopes above the 1700 meter elevation. The June 2006 Golder report was not received in time to incorporate their recommendations into the new pit design. Therefore, the July 2006 Peñasco Pit design incorporates the recommendations of the July 2005 Golder report. However, a review of the design as compared to the June 2006 Golder review indicates inter-ramp slope angles in the bedrock units above the 1700 meter elevation vary from 47 to 50 degrees. Glamis estimates reducing these slope angles in the areas above the 1700 meter elevation that are greater than 47 degrees would add 38.5 million tonnes of waste to the design. This represents an increase of 2.7% to the total waste tonnes of the Peñasco pit. This quantity is not felt significant enough to impact the pit optimization as it now stands.

The oriented core drilling was performed by Major Drilling Co. A geologist was present at the drill rig full-time during drilling. A total 4,126 m of oriented core drilling was completed in eight core holes in the Chile Colorado pit and three core holes in the Peñasco pit. Core hole diameters were typically HQ3 (61 mm ID) but were telescoped down to NQ3 (45 mm ID) if difficult drilling conditions were encountered. Core was recovered in a triple tube core barrel assembly.

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The holes were oriented at an angle of 60 degrees to the horizontal and were sited to intersect the November 2005 design basis pit wall one-third of the ultimate wall height above the base of the final pit level. Core orientation was accomplished using two independent methods: clay impression and a mechanical down hole system referred to as Corientor . Field point load tests were completed for each core run to estimate the unconfined compressive strength of the intact rock. Core runs and geotechnical logging were typically completed at 3 m intervals. A total of 20 samples were collected from the geotechnical core holes for laboratory testing.

An extensive geotechnical database was developed from the oriented core data as well as from exploration logging data (up to hole WC-250).

1.20.2 Tailings Design

The tailings impoundment is designed as a zero discharge facility with the capacity to store temporarily excess water from mill operations and expected climatic events including the design storm. Water will be reclaimed as needed from the tailings facility for use in the mill. The base of the dam and impoundment will rest on native alluvial soils including layers of caliche, silty sand and gravel, sandy silt and sandy clay. Fine tailings will be placed over the alluvial soils to reduce the potential for downward seepage from the tailings pool.

The starter dam will be constructed as an earthfill structure using Peñasco Pit overburden materials. The dam will be raised in a centerline or downstream configuration using cyclone underflow sand tailings. Underdrains will be placed to collect seepage from the sand placement operations and direct it to a seepage collection pond.

Physical properties of the pilot plant tailings have been determined and a subsequent phase of testing has been authorized.

Monitoring wells will be provided downstream from the dam seepage pond.

A tailings storage facility design report was published in June 2006. This recent tailings storage facility design will be finalized based on mine planning. Size, location, and operation of the facility will be updated as required. A future cell will likely be required and has been accounted for financially as an operating cost.

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1.20.3 Rock Piles

Rock piles will be placed close to the pit to minimize haulage costs. The lower layer of all piles will be constructed from benign overburden and oxide buffering material.

1.20.4 Leach Pad

The leach pad will be composite-lined in accordance with Mexican regulations. The pregnant solution pond will be designed and constructed with a double-geomembrane liner separated by a leak collection and recovery system. The emergency overflow pond, which would be used intermittently to contain dilute solution during a storm event, will be designed and constructed with a single geomembrane liner placed over a liner bedding layer. Monitoring wells will be provided downgradient from the leach facility. The design concepts proposed herein, are consistent with Mexican regulations and international design standards for heap leach facilities.

**1.21 Interpretation And Conclusions**

This project has considerable upsides as far as resources, reserves, and recoveries.

The availability of high voltage power is ideal.

Additional water must be secured.

Although negotiations with private owner and the Ejidos have involved the usual individual challenges, in general the area is socially stable with an available work force with hard rock mining heritage. The business climate is favorable.

This project will be good for both Glamis and the state's economy.

**1.22 Recommendations**

M3 recommends development of the Peñasquito project based on 100,000 MTPD.

Given current metal prices, M3 recommends that this project be placed into production as quickly as practical.

With the considerable expertise developed in the Mexico mining industry, M3 recommends that construction be by local and national contractors.

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### 1.23 References

The Feasibility Study is based in part on the findings of others as listed below:

Addendum to the Final Report (Issued September 30, 2005) on Flotation Test Work Conduction on Individual (Variability Tests) and Master, dated 20 March 2006, prepared by Dawson Metallurgical Laboratories.

Addendum to Peñasquito Project, Feasibility Pit Slope Design, dated 24 August 2005, prepared by Golder Associates.

An Assessment of Metallurgical Performance, Concepción del Oro District, Zacatecas State, Mexico, Western Silver, KM1652, dated October 2005, prepared by G&T Metallurgical Services, Ltd.

An Evaluation of Locked Cycle Test Data, Concepción del Oro District, Zacatecas State, Mexico, KM1816, dated 11 May 2006, prepared by G&T Metallurgical Services Ltd.

An Investigation into the Grindability Characteristics of Peñasquito Samples, Project 10044-163, Report 1, dated 21 March 2006, prepared by SGS Lakefield Research Ltd.

Analysis of Carbon Concentrate Peñasquito Project M3 Engineering KM1528, dated 24 July 2004, prepared by G&T Metallurgical Services Ltd.

Cyanide Leach of Peñasco Tailing Products, KM1774, dated 24 January 2006, prepared by G&T Metallurgical Services Ltd.

Comminution Testing, dated 5 May 2006, prepared by Hazen Research.

Chile Colorado and Peñasco Areas, Open Cycle Column Leach on Drill Core Samples, Document No. Q653-04-028.01, dated December 2005, prepared by METCON Research, Inc.

Environmental Impact Assessment, dated November 2005, prepared by M3 Engineering & Technology Corporation.

Estudio Regional De Evaluación Hidrogeológica del Acuífero Cedros, En El Municipio de Mazapil, En El Estado De Zacatecas, dated Diciembre del 2004, prepared by Universidad de Sonora, Departamento de Geología.

Estudio Regional De Evaluación Hidrogeológica del Acuífero Cedros, En El Municipio de Mazapil, En El Estado De Zacatecas, Informe Que Presenta, dated Diciembre del 2004, Revisión Febrero de 2006, prepared by Universidad de Sonora, Departamento de Geología.

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Feasibility Study Heap Leach Facility, Waste Rock Pile, Tailings Impoundment, and plant Site Foundation Recommendations, dated 22 September 2005, prepared by Golder Associates.

Final Report on Flotation Test Work Conducted on Individual (Variability Tests) and Master Composite Samples from the Chile Colorado and Peñasco Deposits within the Peñasquitos Property in Mexico, dated 30 September 2005, prepared by Dawson Metallurgical Laboratories, Inc.

Final Report on Percent Moisture, Bulk Density and Assays Results on Individual Samples from the Chile Colorado and Peñasco Deposits within the Peñasquitos Property in Mexico, dated 7 September 2005, prepared by Dawson Metallurgical.

Flocculant Screening, Gravity Sedimentation, Pulp Rheology, Pressure Filtration, And Vacuum Filtration Studies Conducted For Dawson Metallurgical Laboratories, Inc., dated May 2006, prepared by Pocock Industrial, Inc.

Flora and Fauna Study, dated November 2004, prepared by M3 Engineering & Technology Corporation.

Gold Occurrences in Peñasco Tailings Products, dated 2 November 2005, prepared by G&T Metallurgical Services, Ltd.

Grinding Circuit Design for the Western Silver Peñasquito Project, Peñasco Orebody, Based on Geostatistical Distribution of Hardness, dated March 2006, prepared by Minnovex Technologies, Inc.

Locked Cycle Column Cyanide Leach Oxide Bulk Samples, Document No. Q653-05-028, dated December 2005, prepared by METCON Research, Inc.

Marketing Input into Pre-Feasibility Study for the Peñasquito Project, dated February 2004, prepared by Neil S. Seldon and Associates.

Minera Peñasquito S.A. de C.V., Peñasquito Project Mineral Resource Estimate for Chile Colorado Zone, dated March 2004, prepared by SNC-Lavalin Engineers and Constructors.

Modal Analysis of Test Products, Peñasquito Project, Mexico, M3 Engineering, KM1445, dated 27 January 2004, prepared by G&T Metallurgical Services, Ltd.

Modal Analysis of Test Products, Peñasquito Project, Mexico, M3 Engineering, KM1483, dated 26 February 2004, prepared by G&T Metallurgical Services, Ltd.

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Mineral Liberation Assessments, Peñasquito Project, KM1808, dated 17 March 2006, prepared by G&T Metallurgical Services Ltd.

Mineral Liberation Assessments, KM1732, dated 14 October 2005, prepared by G&T Metallurgical Services, Ltd.

Open Cycle Column Leach Test on Oxide Dump Sample No., dated 7 January 2006, prepared by METCON Research, Inc.

Outstanding Work on Peñasquito Samples, Peñasquito Project, KM 1780, dated 10 February 2006, prepared by G&T Metallurgical Services Ltd.

Peñasquito Feasibility Study, Volumes 1, II and III, dated December 2005, prepared by M3 Engineering & Technology Corporation.

Peñasquito Grindability Evaluation, dated 19 January 2004, prepared by Hazen Research, Inc.

Peñasquito Pb/Zn/Au/Ag Project, Projected Metal Recoveries and Concentrate Grades Prepared for Glamis Gold Ltd., dated 13 July 2006, prepared by T. P. McNulty and Associates, Inc.

Peñasquito Project Crush Size Study Open Cycle Column Leach Oxide Dump Samples, dated July 2005, prepared by METCON Research.

Peñasquito Project, Feasibility Pit Slope Design, dated July 2005, prepared by Golder Associates.

Peñasquito Project Mineral Resource Estimate for the Chile Colorado Zone, dated March 2004, prepared by SNC-Lavalin Engineers and Constructors, Inc.

Peñasquito Project Preliminary Cyanide Leach Tests, dated December 2004, prepared by METCON Research, Inc.

Phase 1 Pit Slope Stability Evaluation Chile Colorado and Peñasco Pits, dated 3 November 2004, prepared by Golder Associates.

Phase II Pilot Plant Testing Program from the Peñasquito Deposit, dated 20 January 2004, prepared by Mountain States R&D International, Inc.

Progressive Grinding Circuit Design for the Glamis Gold Peñasquito Project, dated June 2005, prepared by Minnovex Technologies, Inc.

Proposed Grinding System for the Peñasquito Project Using Small-scale Data, dated 8 July 2005, prepared by SGS Lakefield Research Ltd.

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Report on Metallurgical Testwork Conducted on Composite Samples from the Peñasquito Property in Mexico, dated 15 March 2004, prepared by Dawson Metallurgical, Inc.

Report on Metallurgical Testwork Conducted on a Master Composite (HG + MF) Sample from the Chile Colorado Deposit Located on the Peñasquito Property, dated 26 August 2004, prepared by Dawson Metallurgical Laboratories, Inc.

Report on the Use of Cyanide in Milling and Leaching, dated February 2006, prepared by M3 Engineering & Technology Corporation.

Summaries of Variability Flotation Testing of 50 Samples and Testing of Selected Samples for Gold Recovery from the Peñasquito Project, dated 3 May 2004, prepared by Dawson Metallurgical, Inc.

Summary Report, Metallurgical Review, dated November 2005, prepared by M3 Engineering & Technology Corporation.

Tailings Storage Facility Conceptual Design Report (First Draft), Peñasquito Project, Zacatecas State, Mexico, dated 20 April 2006, prepared by Golder Associates.

Tailings Storage Facility Conceptual Design Report, Peñasquito Project, M3 Engineering & Technology Group, Zacatecas State, Mexico, (Golder has combined the finalized TSF conceptual design report with the geochemical characterization of tailings letter to form a single report.) dated June 2006, prepared by Golder Associates.

Tailings Storage Facility, Geochemical Characterization of Tailings Materials, Peñasquito Project, Zacatecas State, Mexico, dated 25 April 2006, prepared by Golder Associates.

Tailings Testing Information dated June, July and October 2005 prepared by Krebs Engineers.

**1.24 Date**

The information in this report is current as of July 2006.

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**1.25 Additional Requirements For Technical Reports On Development Properties And Production Properties**

**1.25.1 Mine Operations**

The Chile Colorado and Peñasco mine plan will provide sulphide ore to a mill flotation plant that will produce two concentrates for sale: a lead concentrate and a zinc concentrate. Both concentrates will have gold and silver credits. Likewise, the mine plan will provide oxide and mixed ores to a heap leaching facility that will produce a silver and gold doré.

Table 1-16 shows the combined production schedule for both sulphide and oxide ores from both the Peñasco and Chile Colorado deposits. The calendar year 2008, the start of mining operations, is taken as Year 0 in the mining schedule. Half way through Year 1, sufficient sulphide ore is available such that the mill operation can begin under a 6-month startup and commissioning mode. Commercial mill production begins in Year 2 and continues through Year 3 at an annual mining rate of 18.2 million tonnes of sulphide ore per year. Starting in Year 4, production of sulphide mill ore increases to a rate of 36.5 million tonnes per year. The total material mined per year increases over the first 5 years to peak at 179.0 million (511,430 TPD). The production rate increases correspond to significant increases in the equipment quantities of the mining fleet.

The current ore reserves are 476.9 million tonnes of sulphide ore, 87.1 million tones of leach ore with a life of mine waste to ore ratio of 2.76:1. Commercial sulphide production is scheduled for 17 years.

Mining begins in the Peñasco pit, which provides the only sulphide mill feed through Year 12, and continues to provide mill feed through Year 14. Waste stripping begins in Chile Colorado in Year 13 and sulphide ore is mined during Years 13 through 16. The sulphide mill feed is from both pits during Years 13 and 14.

Table 1-19 shows the parameters used to determine the mine equipment fleet requirements.



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**Table 1-16 Mine Production Schedule**  
**Glamis Gold Penasquito Project**  
**Penasco and Chile Colorado Combined Mine Production Schedule at 50,000 tpd Sulphide Ore Feed, Expand to 100,000 tpd in Year 4**

	MILL ORE, SULPHIDE					LEACH ORE					WASTE					Total
	NSR, \$	Gold g/t	Silver g/t	Lead %	Zinc %	kt	NSR, \$	Gold g/t	Silver g/t	Ovbrdn	Oxide	Mixed	Sulphide	Undef.		
12	13.31	0.21	28.9	0.23	1.61	10,502	3.26	0.23	27.1	18,111	7,155	127	93	0	25,48	
75	9.47	0.22	27.9	0.34	0.62	18,922	3.47	0.27	25.9	48,570	21,345	1,036	3,645	7	74,60	
50	8.73	0.26	23.7	0.31	0.54	20,898	3.65	0.30	25.2	2,243	30,090	643	26,876	0	59,85	
50	8.47	0.28	21.7	0.30	0.52	4,668	3.42	0.27	24.7	40,806	47,750	1,181	26,247	98	116,08	
00	10.77	0.42	26.3	0.30	0.65	6,577	3.43	0.30	21.0	2,248	51,001	578	82,096	0	135,92	
00	9.55	0.38	24.6	0.27	0.56	4,279	4.23	0.42	19.8	10,673	28,726	4	98,567	251	138,22	
00	10.77	0.49	27.8	0.27	0.55	1,784	6.14	0.64	25.5	14,578	38,053	0	88,085	0	140,71	
00	14.00	0.71	32.1	0.31	0.63	272	8.70	1.03	21.2	8,337	38,910	0	91,123	3,858	142,22	
00	15.06	0.85	30.9	0.31	0.69	253	11.84	1.34	36.5	4,084	60,596	751	76,816	0	142,24	
00	14.12	0.80	28.5	0.31	0.68	0				0	6,502	1,492	134,506	0	142,50	
00	15.76	0.86	31.9	0.32	0.78	0				0	0	0	142,500	0	142,50	
00	13.66	0.67	35.5	0.40	0.89	2,084	2.60	0.27	14.0	29,901	3,992	0	89,772	51	123,71	
00	16.05	0.86	36.6	0.43	1.01	3,306	2.32	0.23	14.8	26,721	9,864	0	20,552	257	57,39	
66	16.55	0.72	40.7	0.39	1.10	6,518	2.26	0.20	18.8	41	18,039	1,391	12,445	0	31,91	
70	13.16	0.49	39.0	0.34	0.75	6,975	2.77	0.23	24.5	0	4,741	7,319	42,319	0	54,37	
00	12.00	0.28	55.2	0.63	1.03	16	2.33	0.24	14.0	0	0	29	28,802	0	28,83	
39	13.34	0.49	58.2	0.46	1.25	0				0	0	0	732	0	73	
<b>62</b>	<b>13.06</b>	<b>0.60</b>	<b>33.2</b>	<b>0.35</b>	<b>0.76</b>	<b>87,054</b>	<b>3.40</b>	<b>0.28</b>	<b>23.8</b>	<b>206,313</b>	<b>366,764</b>	<b>14,551</b>	<b>965,176</b>	<b>4,522</b>	<b>1,557,32</b>	

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**Table 1-17 Mine Production Schedule  
Glamis Gold Penasquito Project**

**Penasco Pit Only Mine Production Schedule at 50,000 tpd Sulphide Ore Feed, Expand to 100,000 tpd in Year 4**

	MILL ORE, SULPHIDE					LEACH ORE					WASTE				
	NSR, \$	Gold g/t	Silver g/t	Lead %	Zinc %	kt	NSR, \$	Gold g/t	Silver g/t	Ovbrdn	Oxide	Mixed	Sulphide	Undef.	Total
12	13.31	0.21	28.9	0.23	1.61	10,502	3.26	0.23	27.1	18,111	7,155	127	93	0	25,48
75	9.47	0.22	27.9	0.34	0.62	18,922	3.47	0.27	25.9	48,570	21,345	1,036	3,645	7	74,60
50	8.73	0.26	23.7	0.31	0.54	20,898	3.65	0.30	25.2	2,243	30,090	643	26,876	0	59,85
50	8.47	0.28	21.7	0.30	0.52	4,668	3.42	0.27	24.7	40,806	47,750	1,181	26,247	98	116,08
00	10.77	0.42	26.3	0.30	0.65	6,577	3.43	0.30	21.0	2,248	51,001	578	82,096	0	135,92
00	9.55	0.38	24.6	0.27	0.56	4,279	4.23	0.42	19.8	10,673	28,726	4	98,567	251	138,22
00	10.77	0.49	27.8	0.27	0.55	1,784	6.14	0.64	25.5	14,578	38,053	0	88,085	0	140,71
00	14.00	0.71	32.1	0.31	0.63	272	8.70	1.03	21.2	8,337	38,910	0	91,123	3,858	142,22
00	15.06	0.85	30.9	0.31	0.69	253	11.84	1.34	36.5	4,084	60,596	751	76,816	0	142,24
00	14.12	0.80	28.5	0.31	0.68	0				0	6,502	1,492	134,506	0	142,50
00	15.76	0.86	31.9	0.32	0.78	0				0	0	0	142,500	0	142,50
00	13.66	0.67	35.5	0.40	0.89	0				0	0	0	89,772	0	89,77
00	16.05	0.86	36.6	0.43	1.01	0				0	0	0	20,465	0	20,46
16	16.71	0.73	40.9	0.39	1.11	0				0	0	0	10,139	0	10,13
45	16.03	0.64	42.1	0.29	0.82	0				0	0	0	7,151	0	7,15
						0									
						0									
<b>48</b>	<b>13.28</b>	<b>0.63</b>	<b>31.2</b>	<b>0.33</b>	<b>0.74</b>	<b>68,155</b>	<b>3.66</b>	<b>0.30</b>	<b>24.9</b>	<b>149,650</b>	<b>330,128</b>	<b>5,812</b>	<b>898,081</b>	<b>4,214</b>	<b>1,387,88</b>

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**Table 1-18 Mine Production Schedule  
 Glamis Gold Penasquito Project**

**Chile Colorado Pit Only Mine Production Schedule at 50,000 tpd Sulphide Ore Feed, Expand to 100,000 tpd in Year 4**

MILL ORE, SULPHIDE						LEACH ORE				WASTE					Total	
kt	NSR, \$	Gold	Silver	Lead	Zinc	kt	NSR, \$	Gold	Silver	Ovbrdn	Oxide	Mixed Sulphide	Undef.			
		g/t	g/t	%	%			g/t	g/t							
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b						0							0	0		
b	0					2,084	2.60	0.27	14.0	29,901	3,992	0	0	51	33,944	
b	0					3,306	2.32	0.23	14.8	26,721	9,864	0	87	257	36,929	
b	650	7.64	0.41	28.6	0.34	0.67	6,518	2.26	0.20	18.8	41	18,039	1,391	2,306	0	21,777
b	1,325	7.50	0.20	32.9	0.43	0.63	6,975	2.77	0.23	24.5	0	4,741	7,319	35,168	0	47,228
b	9,200	12.00	0.28	55.2	0.63	1.03	16	2.33	0.24	14.0	0	0	29	28,802	0	28,831
b	7,239	13.34	0.49	58.2	0.46	1.25	0				0	0	0	732	0	732
<b>48,414</b>	<b>11.09</b>	<b>0.29</b>	<b>50.1</b>	<b>0.56</b>	<b>0.96</b>	<b>18,899</b>	<b>2.50</b>	<b>0.22</b>	<b>19.6</b>	<b>56,663</b>	<b>36,636</b>	<b>8,739</b>	<b>67,095</b>	<b>308</b>	<b>169,441</b>	

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**Table 1-19 Mine Plan Basis**

Available Days per Year	d	365
Available Shifts per Day	shifts / d	2
Available Shifts per Year	shifts / yr	730
Scheduled Operating Days / Year	d	350
Scheduled Operating Shifts / Year	shifts	700
Shift Duration	hrs	12
Available Time per Shift	min	720
Lunch & Breaks Duration	min	60
Equipment Inspection Duration	min	10
Shift Change Duration	min	10
Fuel, Lube and Service Duration	min	10
Operating Delays per Operating Hour	min / op hr	10
Operating Delays per Shift	min / shift	105
Effective Minutes per Shift	min	525

**Sulphide Ore and Waste Rock**

Material Average In Place Density	kg / bcm	2,570
Swell %	%	40.0%
Swell Factor	*	0.71
Material Bulk Density, Dry	kg / lcm	1,836
Moisture Content	%	5%

**Oxide & Mixed Ore and Waste Rock**

Material Average In Place Density	kg / bcm	2,400
Swell %	%	40.0%
Swell Factor	*	0.71
Material Bulk Density, Dry	kg / lcm	1,714
Moisture Content	%	5%

**Overburden**

Material In Place Density	kg / bcm	2,200
Swell %	%	40.0%
Swell Factor	*	0.71
Material Bulk Density, Dry	kg / lcm	1,570
Moisture Content	%	5%

The mine plan incorporates a conventional shovel (55 cubic meter) truck (290 tonne) open pit mining operation with the basic parameters shown on Table 1-19.

## a) Equipment Selection

The mining equipment sized to accommodate the mine plan at a production rate peaking at 511,429 MTPD of total material (assuming 350 operating days per year) during Years 4 through 10 consists of large sized primary



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mining equipment and a selection of matched pit/dump support and maintenance equipment.

For the purpose of capacity and cost calculations, it has been assumed that the major mining equipment will be the equivalent of P & H 4100 shovels, Le Tourneau 1850 Loaders, P & H 250XP Diesel blast hole drills and Komatsu 950E haul trucks. Support equipment including track dozers, rubber tire dozers, excavator, and graders are assumed to be equivalent to the Caterpillar models.

Drilling for all materials except the heap leach ore will be carried out with crawler mounted, diesel powered, blast hole drills on 15 m benches drilled with 1.5 m of sub-grade. It is assumed that 20% of the overburden will be drilled and blasted using a wider hole pattern. The heap leach ore drill pattern will be adjusted as needed to assure rock fragmentation of about 127 to 152 mm for leaching. This may require a smaller drill than what is presently included in the mine capital cost estimate.

It is assumed that blasting will be carried out primarily with conventional ANFO explosive, supplied by an explosives contractor. The blast holes will be loaded by mine personnel and initiated by the blasting supervisor. A powder factor of 0.20 kg / tonne has been used for explosives consumption estimation in rock, 0.12 kg / tonne for overburden and 0.40 kg / tonne for the heap leach ore.

The primary loading units will be the P&H 4100 shovels equipped with a 55 cubic meter bucket. An L-1850 LeTourneau front-end loader (25 cubic meter bucket) will be used for selective mining at ore/ waste contacts, low mining faces and in the tighter mining geometries. The loader will also be used for general and utility work around the mine property.

The 290 tonne class haul trucks will be the primary hauling unit for ore and waste.

b) Equipment Requirements

Major mining equipment requirements have been determined on the basis of a two shift per day basis for seven days per week to a total of 350 days per year (assuming 10 holidays and 5 shut down days for weather or other reasons). The mine will operate a total of 700 shifts per year with four mining crews working on a 4 on and 4 off rotation.

A stockpile will allow the mill to operate 365 days per year.

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Table 1-20 lists the mining and support equipment that has been selected, sized and evaluated for this plan. The list also includes estimated support equipment requirements.

Haul truck productivities over the life-of-mine were calculated on the basis of the fixed and variable components of the hauling cycle and travel distances to the primary crusher truck dump pocket at the 1,968 m elevation, to the run of mine heap leach and to the waste dumps. For this study, the waste material has been segregated into separate dumps for overburden, oxide plus mixed material and sulphide material.

**Table 1-20 Mining Equipment Selection\***

<b>Equipment</b>	<b>Initial No. Reqd</b>	<b>Maximum No. Reqd</b>	<b>General Specification</b>
Rotary Blast Hole Drill	2	8	P & H 250XP, 311 mm Diesel
Electric Shovel	2	4	P&H 4100XBP, 41 cu m, Electric
Wheel Loader	2	2	L-1850 LeTourneau Loader
Haul Truck	15	75	Komatsu 930E, Series III 320, End Dump
Track Dozer	6	8	6 ea D10 T, 10SU, 18.5 cu m, Ripper, 2 ea D9T for Stockpile & Tailings
Rubber Tire Dozer	0	2	Cat 854G, Universal Blade
Grader	3	5	Cat 16H, 4.9 m
Water Truck	3	5	Cat 777, 70,000 liter
Wheel Loader	1	1	Cat 988H
Auxiliary Rock Drill	1	1	IR ECM 590/YH Rock Drill,
Backhoe / Excavator	1	3	Cat 325, 2.2 cu m, with Hammer
Fuel / Lube Truck	2	2	18,500 liter
Blast Hole Stemmer	2	3	Cat 416C
Flatbed Truck	1	2	2 tonne
ANFO/Slurry Truck	2	3	18 tonne
Cable Reeler	1	2	Cat 966G
Crane Truck	1	1	25 tonne
Forklift	1	2	Hyster H100XM
Forklift	1	2	Sellick SD-100
Mobile Crane	1	1	120 tonne Grove
Service / Welder / Steam Truck	6	6	25,000 kg GVW
Grader	1	1	Cat 160H
Backhoe	1	1	Cat 420
Water Truck	1	1	4000 gallon
Trailer	1	1	2660 trailer
Dump Truck	1	1	10 yard
Loader	1	1	Skidsteer
Integrated Tool carrier	1	2	Cat IT-62G, Tire Service / Maintenance
Crew Bus	2	6	20 man
Pick-Up Truck	20	40	4 x 4
Light Plant	8	14	Diesel Generator
Mine Communications System	1	1	
Mine Radios	70	173	

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Pumps	2	5	Submersible, Pit Dewatering
Mine Dispatch System	1	2	19 high precision GPS units
Generator	1	1	Mounted on trailer
Engineering Computers & Software	1	1	Drafting, Plotting, Engineering
Surveying Equipment	1	1	GPS Surveying System
Mine Maintenance Computers & Software	1	1	Inventory Control, Planning

\* Selection assumes fire truck and ambulance are to the account of G&A area.

\* Selection assumes existence of on site diesel / gasoline fuel storage with dispensing capability to fuel haul trucks.

\* Selection provides for full field fuel service to dozers, loaders, excavator and portable generators only. Trucks refueled at tank farm.

\* Selection does not include step down transformers, switchgear and cabling for pit power.

\* Selection does not include mobile equipment maintenance shop equipped with small tools, power tools,



welders, hoists,  
lube dispensing

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c) Manpower

All personnel in the mine department will be Mexican nationals with the exception of an expatriate mine superintendent, the mine and maintenance general foremen, the mine and maintenance trainers and a maintenance planner for the initial years (Years 1- 3) of production. It is expected that based on the unemployment levels in the area and the regional experience in mining, that there will be no difficulty staffing the project.

Mine operations and mine maintenance manpower complement has been estimated based on a two 12 hour shift per day, four-on-four-off, seven day per week operation for all unit operations. Supervision, engineering personnel and the blasting crews are scheduled to work on an eight hour day, five day per week rotation.

In general one operator has been assigned to each equipment unit on each shift. For instance, in drilling operations four operators are assigned to each drill during high utilization years and reduced during low drill utilization years. Some manpower reductions have been made where opportunities to use operators on several equipment types exist, such as in mining support equipment.

Maintenance personnel requirements have been estimated on the basis of equipment requirements and utilization with adjustments to reflect an average mine-life ratio of about 0.65:1 mine maintenance personnel to mine operating personnel.

A summary life of mine manpower schedule is shown on Table 1-21.

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**Table 1-21 Summary Manpower Requirements**

<b>Area Position</b>	<b>Number</b>
<b>General Management</b>	
General Manager	1
Executive Secretary	1
Receptionist	1
<b>Sub-Total</b>	<b>3</b>
<b>Mine</b>	
Mine Manager	1
Mine Clerk	1
Mine Superintendent	1
Mine General Foreman	1
Senior Shift Foreman	3
Shift Foreman	9
Equipment Trainer	1
Shovel/Loader Operators	21
Support Equipment Operators	60
Truck Operators	225
D&B General Foreman	1
Blasting Supervisor	2
Blasting Crew	9
Drillers	36
Dewatering & Cable Crew	12
Laborers	9
VS&A Allowance	14
Mine Maintenance Superintendent	1
Maintenance Planner	4
Maintenance Supervisors	3
Mechanics	12
Welders	12
Lubemen	9
Mechanic Helpers	6
Laborers	3
VS&A Allowance	10
Technical Services Manager	1
Chief Engineer	1
Mine Engineers	6
Ore Control Engineers	6
Lead Surveyor	3
Survey Assistant	12
Chief Geologist	1
Mine Geologist	9
<b>Sub-Total</b>	<b>505</b>

**Process**

Process Manager	1
Process Clerk/Assistant	1
Mill Superintendent	1
Grinding/Crusher Supervisors	3
Grinding Operators	6
Grinding Helpers	6
Lime Circuit Operators	3
Lime Circuit Reagents	2
Crusher Operators	3
Crusher Helpers	3
Flotations Supervisors	3
Pb Flotation Operators	6
Pb Flotation Helpers	9
Zn Flotation Operators	6
Zn Flotation Helpers	9
Tailings Operators	3
Tailings Helpers	6
Pb/Zn Concentrate Supervisors	3
Pb Concentrate Operators	3
Pb Concentrates Helpers	3
Zn Concentrate Operators	3
Zn Concentrate Helpers	3
Scale Operator	3
Leach Superintendent	1
HL Supervisors	3
Merrill-Crowe Operators	3
Merrill-Crowe Helpers	3
Refinery Operators	2
Refinery Helpers	1
HL Helpers	2
Metallurgist Superintendent	1
Chief Metallurgist	1
Metallurgists	3
Chief Chemist	1
Mill Lab Supervisors	3
Sample Prep Helpers	9
Fire Assay Operators	9
Wet Lab Operators	9
HL Lab Supervisor	1
HL Samplers	3
HL AA assayers	3
HL Environmental Operator	1
Maintenance Superintendent	1
Maintenance Planner	1
Plant Mechanics	27
Plant Electrical/Instrumentation	6
<b>Sub-Total</b>	<b>183</b>

**Administration**

Administrative Manager	1	
Environmental Coordinator	1	
Environmental Technicians	3	
Environmental Laborers	6	
Safety & Health Coordinator	1	
Safety Technicians	3	
Doctors	2	
Paramedics	1	
Nurses	1	
Community Relations Coordinator	1	
Community Relations Supervisor	1	
Community Relations Technicians	3	
<b>Sub-Total</b>		<b>24</b>
<b>Human Resources</b>		
HR Manager	1	
HR Secretary	1	
HR Supervisor	2	
HR Specialist	3	
Payroll Administrator	4	
Security	3	
Camp Administrator	1	
Janitorial Service	0	
<b>Sub-Total</b>		<b>15</b>
Accounting		
Controller	1	
Senior Mine Accountant	1	
Accounting Clerk	1	
Cost Accounting Supervisor	1	
Cost Accounting Assistant	1	
Tax Accountant	1	
Sr. Accounts Payable	1	
Accounts Payable Assistants	3	
IT Supervisor	1	
IT Assistants	5	
<b>Sub-Total</b>		<b>16</b>
Purchasing and Warehousing		
Purchasing & Warehouse Manager	1	
Purchasing Coordinator	1	
Buyers	4	
Warehouse Supervisor	1	
Warehouse Assistant	1	
Warehouse Attendants	3	
Drivers	4	
<b>Sub-Total</b>		<b>15</b>
<b>TOTAL</b>		<b>761</b>
<b>Peñasquito Manpower Summary</b>		
General Manager	3	

Mine	505
Process	183
Administration	24
Human Resources	15
Accounting	16
Purchasing and Warehousing	15
TOTAL	761

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d) Mine Maintenance and Dry Facilities

A mine service complex will be provided adjacent to the plant site which will include truck and support equipment repair and maintenance bays, a steam bay, a tire service bay and a welding bay. Fuelling facilities for haul trucks and small mobile equipment will be constructed. A mine dry which includes clean and dirty change areas, storage lockers and washroom/shower facilities will be constructed.

e) Explosive Magazines and AN Storage

Explosives supplies, office/shop facilities and AN storage facilities for mining operations will be supplied by an explosives contractor. High explosives will be stored in magazines, and AN will be stored in dispensing silos. The magazines will be fenced and located within the property boundary and situated to meet the legal required distances from the mine facilities, roads or populated areas.

Service roads connecting the magazine area, the AN storage silo, and the office/shop facilities will be constructed. Fuel oil for blasting will be supplied by the owner.

f) Pit Power

The electrical power to operate in-pit submersible sump pumps for mine dewatering and the electric loading shovels will be distributed from the main site substation to in-pit and pit perimeter transformers and switchgear.

g) Mine Dewatering

The groundwater inflow into the pits has been assumed to be minimal for purposes of this study. It is anticipated that groundwater inflow and pit runoff will be carried by drainage ditches along haul roads and sumped in the pit floor for pumping out of the pit. Additional pumping capacity for flood control will be required for periods of intense precipitation during the wet season. A requirement for peak inflow pumping capacity has been assumed.

Simple ditches along pit rim perimeters will prevent runoff water from entering the pit. A mining support excavator will be available to provide ongoing road/runoff ditching and pit sump excavation capacity.

h) Engineering and Grade Control

The mine department personnel complement will include engineers, a surveyor, a geologist, a draftsman, grade control technicians, and a mine clerk that will carry out required mine engineering, surveying, geology,

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grade control, production planning, and production tracking tasks. The mine engineering department will be equipped with office computers, mine planning software, GPS surveying equipment, and CAD drafting stations and software. A truck dispatching system has not been included.

Sulphide mill ore, oxide plus mixed heap leach ore and ore/waste contacts will be marked in the field to guide the ore loading operations to allow for selective mining with a minimum of dilution. Grade contacts will be defined with aid of sampled and assayed blast hole cuttings.

The maintenance clerk will schedule equipment maintenance, monitor repair parts inventories and track maintenance performance with the aid of maintenance scheduling software.

1.25.2 Recoveries

This is discussed in Section 1.18.

1.25.3 Markets

At the time of this report no agreements have been made with any smelters and no discussions have been entered into with a view to concluding any agreements. Notwithstanding this, several smelter operators have expressed interest in entering into discussions. Samples of the concentrates have been provided to those requesting it.

Market research has been performed by a specialist consultant, Neil S. Seldon and Associates Limited. The following is a summary of the findings:

The markets for the lead and zinc concentrates from Peñasquito fall into two categories, smelters within Mexico and smelters overseas. The overseas smelters are further divided into Asian, North American and European markets.

For the purpose of the study, it is assumed that all lead concentrate will be smelted in Mexico but it is also recognized that some will be smelted in overseas smelters. The smelter terms recommended in the consultant's report for the lead concentrate represent typical terms for the market. They represent a forecast of terms based on historical averages with due consideration for projected supply and demand over the foreseeable future.

It is possible that there may be a market for zinc concentrate in Mexico. The report assumes that zinc will be split between local and overseas either Europe or Asia. Again the smelter terms used in the calculations in this



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report represent an average of the typical terms deduced from the market research.

Transportation cost and port charges in-country have been determined based on a survey of transportation companies and other users. They represent current costs. Ocean freight charges recommended by the consultant are projected future costs based on historical averages and projected supply and demand.

Actual smelter terms and freight costs used in the report are set out in Section 1.25.8.

#### 1.25.4 Contracts

Mining and mill operating costs as discussed later are derived from engineering estimates based on the current level of information available. They are not based on contract prices obtained from third parties. The rates used are viewed as being within the typical range for operations of this size.

As noted in the previous section, no smelting, refining or transportation contracts have yet been entered into, nor have any such discussions been initiated.

#### 1.25.5 Environmental Considerations

The Peñasquito mining Project is located in a rural area of mining tradition, since its geological characteristics embody a mineral ore body able to be exploited with the best available technology.

The site is not within protected natural areas, and the mining work is not considered a risk to the environmental system integrity since it will take the required environmental control measures for the flora and fauna species identified in the site.

Other identified impacts will be drainage and the site soils, but the site impact will be lessened by mitigation and control measures to be implemented in the different project phases.

Summing up, there are no inconveniences for the mining project to be authorized on environmental impact because the ideal conditions are in place to comply with the present Mexican environmental codes.

Federal laws primarily regulate mining in Mexico, however there are several permit programs subject to state and local jurisdiction. The key permits required are shown in Table 1-22. The chart shows the government agencies involved as well as the status and the estimated approval time for each permit. The Secretary of Environment and Natural Resources

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(SEMARNAT) is the chief agency regulating environmental matters in Mexico. The CNA has authority over all matters concerning water rights and activities that affect ground and surface water supplies, including activities in the floodplains.

The SEMARNAT permit programs that are mandatory for the construction stage are the Environmental Impact Manifest (MIA), Risk Study and the Land Use Change Study. An endorsement must also be obtained at the municipal level to start the mine construction. A release letter from National Institute of Anthropology and History (INAH) must be obtained prior to any actions that could disturb the identified cultural resources at the site. Glamis has obtained a release letter from INAH.

The explosives use permit must be secured before any explosives can be brought into the storage area. The National Secretary of Defense (SEDENA) has authority over all explosives permits.

The preparation of a full MIA for the mine and processing plant is complete in accordance with Mexican requirements. The MIA will comprise the following volumes:

Environmental Impact Assessment

Risk Analysis

Land Use Change

EIA has been prepared with data of 50,000 TPD. In the future a change to EIA needs to be done to 100,000 TPD or SEMARNAT could request a new EIA.

A separate MIA must be prepared for the power line once the final alignment is established. This MIA does not require a risk analysis.

A third MIA and CUS is being prepared for associated work like camp, landing strip, mine by pass and aggregate crushing plant.

The Aquifer Study and Flora and Fauna Study are both complete. The Aquifer Study has identified adequate water for the project and work is in progress to secure this water. The Flora and Fauna Study identified no obstacles to the project.

First phase of granular Aquifer Study is finished. Currently the study of bedrock aquifer is in progress to define the quantity of water required by the mine project.

Key elements of reclamation will be accomplished during the course of mining.

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Rock pile will be placed at a 2.5 horizontal to 1 vertical average side slope.

Leach piles will be placed at a 2.5 horizontal to 1 vertical average side slope.

Tailings will be placed by centerline spigot (or cyclone) construction and have a minimum average side slope of 4 horizontal to 1 vertical.

Rock pile foundations will be caliche or silty-clay grade surface. A suitable thickness of pit oxide overburden (10 meters minimum) will be placed on this benign strata. Sulphide or oxide waste rock will be placed over the oxide overburden layer. During the last placements of material, surveying will be employed to ensure proper slopes and suitable grades for drainage of the top surface. At the end-of-mine life, a top cover layer will be placed on the sides and top of each rock pile unit, in effect bagging the sulphide material in an oxide envelope. In the case of the Peñasco rock piles, overburden for the Chile Colorado pit will likely be largely used as it is scheduled to be mined after Peñasco. For Chile Colorado waste rock, topcover will come from previously stockpiled topsoil. The possibility also exists that Chile Colorado waste rock may be deposited in the Peñasco Pit.

Leach pile foundations will be caliche or silty-clay scarified surface. On this surface a double liner will be placed (clay and LLDPE geomembrane). On top of this a cushioning sand layer will be followed by a crushed and screened drainage layer.

Tailings foundation will be caliche or silty-clay grade surface. The caliche/silty-clay will be overlain by consolidated tails to form a sufficient barrier for tails confinement.

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**Table 1-22 Key Permits For 50,000 MTPD Plant**

<b>REQUIRED PERMIT</b>	<b>MINING STAGE</b>	<b>AGENCY</b>	<b>ESTIMATED RESPONSE TIME</b>	<b>ACTUAL STATUS (June 2006)</b>
Environmental Impact Manifest-mine <sup>1</sup>	Construction/operation/abandonment	SEMARNAT- Federal Offices Mexico DF)	0-120 works days.	Complete by August 2006
Land use change study-mine <sup>1</sup>	Construction/operation	SEMARNAT-DGGFS <sup>2</sup> -Federal offices.		90% complete by August 2006
Risk analysis study-mine <sup>1</sup>	Construction/operation	SEMARNAT-(Mexico City office)	0-120 works days.	75% complete by August 2006
Environmental Impact Manifest-power line <sup>1</sup>	Construction/operation/abandonment	SEMARNAT-State offices	0-120 works days.	50% complete by August 2006
Land use change study-power line <sup>1</sup>	Construction/operation	SEMARNAT-DGGFS <sup>2</sup> -State offices.	0-120 works days.	50% complete by August 2006
Land use license <sup>1</sup>	Construction	Mazapil municipality	2 months	Discussions underway
Explosive handling and storage permits	Construction/-operation	SEDENA <sup>3</sup> (Also requires state and local approvals)	4 months	Application to be submitted when final design is complete Environmental Impact authorization required.
Archaeological release letter <sup>1</sup>	Construction	INAH <sup>4</sup> (State offices)	3 to 4 months	The mine authorization is in place but not so for the power line, we re working to get it. Complete
Water use concession title	Construction/operation	CNA <sup>5</sup> (State offices)	60 work days	Approx. 1 year to obtain permit of 10 million cubic meters of water.

Water discharge permit	Operation	CNA (State offices)	60 work days	Application to be submitted when final design is complete
Unique license	Operation	SEMARNAT-State offices	3 to 12 months	Not required for construction and start-up, application will be submitted once mine is in operation
Accident prevention plan	Operation	SEMARNAT-State offices	Not defined	Not required for construction and start-up; to be submitted once mine is in operation

<sup>1</sup>Mandatory to start construction activities.

<sup>2</sup>DGGFS (General Department of Permitting for Forestry and Soils)

<sup>3</sup>SEDENA (National Secretary of Defense)

<sup>4</sup>INAH (National Institute of Anthropology and History)

<sup>5</sup>CNA (National Water Commission)

<sup>6</sup>All studies based on 50,000 MTPD plant. An amendment will be required for 100,000 MTPD plant.

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1.25.6 Taxes

Taxes have been calculated on a project basis in accordance with published Mexican taxation legislation. Additional details of how taxes have been applied can be found in Volume II of the Feasibility Study. Specialist taxation advice has not been solicited at this stage and no tax planning strategies have been assumed.

IVA (Impuesto Valor Agregado) is a value-added sales tax at the Federal level. This tax has not been included in the estimates.

PITEX (Programa de Importacion Temporal para Producir Articulos de Exportacion) is a federal program allowing a waiver of import duties on imported items that will be exported at the end of the project. The cost of administering this program has been included in the estimate.

Income tax has been applied at a rate of 28% of taxable income after 2007 and an allowance for employee profit sharing has been included.

Total federal income tax paid over the life of the mine is \$1.3 billion.

1.25.7 Reclamation Costs

Site Reclamation Costs at end of Mine Life are \$15,784,000.

SEMARNAT Change of Land Use Fee will be a sunk cost and not available for reclaiming but negates the requirement for bonding.

It is noted that in addition to the reclamation costs indicated above, additional operating costs are incurred during the course of mining to accomplish reclamation as a continual process, e.g., rock piles and leach piles are placed to final average side slopes (instead of angle of repose) needed for reclamation, as described in 1.25.5. Annual haulage costs reflect this accordingly.

1.25.8 Economics

a) Key Parameters

The following unit costs significantly affect the financial model.

Mechanical and electrical equipment costs are in late second quarter 2006 dollars, based on recent hard money vendor quotations.

Electricity power costs are based on published second quarter 2006 CFE rates.

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Diesel costs are based on second quarter 2006 negotiated contracts for other M3 Mexico projects.

Base Case Metals pricing is based on the M3 end of June 2006 values, calculated on 60% historical and 40% futures. (See Paragraph F for further explanation).

Smelter terms represent a forecast based on historical terms, current terms, and future projections.

Concentrate transportation charges and port storage charges are based on current pricing.

Concentrate ocean shipping charges are a forecast based on recent historical terms, current terms, and future projections.

Reagent costs are based on second quarter 2006 quotations and the Glamis El Sauzal data bank.

Grinding media costs are based on second quarter 2006 quotations and the Glamis El Sauzal data bank.

Construction labor rates are based on the M3 historical data base as updated by bids received in 2005 and 2006.

Operation labor rates are based on the M3 historical data base as updated by confidential records.

M3's capital costs estimate has been calibrated to unit metrics (e.g., all in cost for cubic meter of concrete or tonne of structural steel) received on comparable construction bids in 2005 and 2006.

b) Ore Reserves and Mine Life

These are summarized in Section 1.19.

c) Metallurgical Recoveries

Recoveries are indicated in Section 1.18.

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## d) Smelter Terms

**Table 1-23 Smelter Payable and Deducts****Lead Concentrate**

Payable Lead in Lead Concentrate	95.00%
Lead Minimum Deduction unit	0.0
Treatment Charge \$/t	\$ 160.00
Gold Refining Charge \$/oz	\$ 6.00
Silver Refining Charge \$/oz	\$ 0.40
Payable Zinc in Lead Concentrate	0.00%
Payable Gold in Lead Concentrate	95.00%
Gold Deduction gpt	1.0
Payable Silver in Lead Concentrate	100.00%
Silver Minimum Deduction gpt	50.0

**Zinc Concentrate**

Payable Zinc in Zinc Concentrate	85.00%
Zinc Minimum Deduction unit	0.0
Treatment Charge \$/t*	\$ 205.00
Payable Lead in Zinc Concentrate	0.00%
Payable Gold in Zinc Concentrate	75.00%
Gold Deduction gpt	1.0
Payable Silver in Zinc Concentrate	70.00%
Silver Deduction gpt	93.3

## Concentrate Transportation Costs

The base case considers concentrate transportation charges as follows:

Truck from mine to port	\$ 25.00
Port storage and loading charges	\$ 10.00
Ocean freight including losses and insurance	\$ 35.00
Total Overseas Cost	\$ 70.00
Truck from mine to inland smelter	\$ 45.00
Total Local Cost	\$ 45.00

Wet concentrate tonnages estimates are based on a moisture content of 8%.

Concentrate quality, based on Peñasco ore, is characterized in the following table. Concentrate from Chile Colorado ore is very similar. In general, the concentrates produced are clean and relatively free of deleterious elements. Although antimony and cadmium may be on the





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high side, general discussions with smelters suggest that these may not be problematic for all the smelters. No penalty charges have been assumed.

**Table 1-24 Pilot Plant Concentrate Production**

Element	Units	Concentrate Mass and Assays	
		Lead	Zinc
Mass	Kg	7.2	9.3
Lead	%	52.6	2.83
Zinc	%	7.3	51.0
Gold	ppm	70.3	6.8
Silver	ppm	2960	486
Antimony	%	1.86	0.244
Arsenic	%	0.536	0.137
Bismuth	ppm	719	96
Cadmium	%	0.077	0.354
Cobalt	%	0.03	0.002
Copper	%	2.36	0.55
Iron	%	6.6	3.25
Mercury	ppm	<1	4
Molybdenum	%	<0.001	<0.001
Nickel	%	0.007	0.05
Selenium	ppm	891	67
Silica	%	3.35	6.4
Sulphur	%	21.5	29.7
Aluminum Oxide	%	0.98	1.77
Calcium Oxide	%	0.22	0.61
Magnesium Oxide	%	0.14	0.27

e) NI 43-101 Metals Pricing for Reserves

Table 1-25 shows end of June 2006 M3 metal pricing based on three years of recent historical data and two years of future price forecast. M3 has used this proprietary method since 2004. M3 notes that Orion Research on October 5, 2005 stated "We are having indications that the SEC will allow the use of three-year trailing and two-year forward gold prices for reserve calculation." Glamis has conservatively approximated its pit geometry using values close to 36-month historical data.

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Gold \$450/ounce  
Silver \$7/ounce  
Zinc \$0.60/pound  
Lead \$0.30/pound

f) NI 43-101 Metals Pricing for Financial Analysis

M3 has used the weighted average for NI 43-101 financial analysis.

Gold \$532.74/ounce  
Silver \$8.841/ounce  
Zinc \$0.787/pound  
Lead \$0.424/pound

**Table 1-25 Summary of Historical and Future Commodity Prices June 30, 2006**

Commodity	Spot Price EOM June 2006	Prices used for US Sec. Filings			Prices Used for NI 43-101 Filings Weighted Average (60-40)
		Historical Price (36-months) Source of Data	Futures Price Forecast (24-Month) Projected thru June 2008		
<b>Gold</b> (USD per Tr Oz)	613.50	445.50 COMEX Daily Ave LME Daily Ave	663.61	COMEX Futures	532.74
<b>Silver</b> (USD per Tr Oz)	10.700	7.343 COMEX Daily Ave LME Daily Ave	11.087	COMEX Futures	8.841
<b>Copper</b> (USD per lb)	3.355	1.593 LME Monthly Ave	2.558	COMEX Futures & LME Futures	1.979
<b>Lead</b> (USD per lb)	0.447	0.413 LME Monthly Ave	0.452	LME Futures	0.424
<b>Nickel</b> (USD per lb)	10.100	6.474 LME Monthly Ave	6.558	LME Futures	6.508
<b>Zinc</b> (USD per lb)	1.460	0.629 LME Monthly Ave	1.025	LME Futures	0.787

Notes:

- Precious Metals updated through End-of-Month (EOM) June 2006  
Base metals updated through EOM June 2006
- Sources:  
Commodity Exchange (COMEX,

division of NY  
Mercantile  
Exchange) prices  
for gold and silver  
daily historical  
and EOM futures  
pricing

London Metals  
Exchange  
(LME) for copper,  
lead, nickel, and  
zinc monthly  
average settlement  
and futures  
pricing. Copper  
futures pricing is  
the average of the  
LME and  
COMEX copper  
futures prices.

3. M3 uses weighted average prices for NI-43-101 reporting purposes, 60 % historical prices; 40% futures forecast prices except for lead.
4. Lead futures price projected for 15 months forward. Historical to futures price ratio is 70.6% to 29.4%.
5. Spot prices are from London Bullion Market Association & Kitco Metals for precious metals and base metals, respectively.

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g) Exchange Rate

The following exchange rates have been used:

11.39 Mexican = US \$1.00  
Peso

0.789 Euro = US \$1.00

114.4 Japanese = US \$1.00  
Yen

1.35 Aus \$1.00 = US \$1.00

8.00 Chinese = US \$1.00  
Yuan

h) Operating Costs

These are outlined in Section 1.3.11.

i) Capital Costs

These are outlined in Section 1.3.10.

j) Royalties

The base case includes a 2% NSR royalty payable to Kennecott on all production.

k) Taxes

Taxes are discussed in Section 1.25.6.

l) Financing

The base case economic analysis has been run on a basis of 100% equity.

m) Inflation

The base case economic analysis has been run with no inflation (constant dollar basis). Capital and operating costs are expressed in July 2006 United States dollars.

n) Economic Results

For end of month of June 2006 M3 metals pricing, the economic results based on a 100% equity calculation indicate that with an after-tax and mandated profit sharing, an IRR of 18.7% can be achieved. The corresponding after tax NPV is \$3.3 billion at a zero discount rate, \$1.5 billion at a 5% discount rate, and \$650 million at a 10% discount rate.

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**Table 1-26 Mine Costs Summary**

<b>Total Tonnes</b>	<b>Total Mine Cost</b>	<b>Mine Cost per Total Tonne Mined</b>	<b>Ore Tonnes Mined</b>	<b>Mine Cost per Ore Tonne Mined</b>
<b>(000)</b>	<b>(\$000)</b>	<b>\$/t</b>	<b>(000)</b>	<b>\$/t</b>
2,121,342	\$1,721,311	0.811	564,016	3.052

**Table 1-27 Average Operating Margin (\$/tonne ore)**

	<b>LOM</b>
Lead and Zinc Concentrate Revenues	22.58
Treatment and Shipping Charges	3.63
Net Smelter Return	\$ 18.95
Operating Cost	9.90
Royalties and Taxes	0.34
Reclamation and Depreciation	2.07
Gross Margin after RTRD	\$ 6.64

**Table 1-28 Cash Flow Summary**

<b>After Tax Cash Flows (\$000)</b>	<b>LOM</b>
<b>Income Statement</b>	
Revenues	\$ 11,451,521
Production Cost	6,942,909
Income Taxes	1,262,412
<b>Net Income</b>	\$ 3,246,200
<b>Cash Flow Statement</b>	
Net Income	\$ 3,246,200
Plus Depreciation	1,154,282
Working Capital	0
Cash Flow from Operations	\$ 4,400,482
Initial Capital Investment	826,844
Sustaining Capital	327,438
Salvage Income	(10,000)
<b>Net Cash Flow</b>	\$ 3,256,200



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**Table 1-29 Key Financial Metrics**

<b>After Tax Rate Of Return And Payback</b>	<b>LOM</b>
IRR (100% equity basis)	18.7%
Payback (years, 100% equity basis)	5.6
<b>After Tax Net Present Value</b>	<b>LOM</b>
0% Discount	\$3.3 billion
5% Discount	\$1.5 billion
10% Discount	\$650 million
o) Sensitivities	

Fluctuation on Main Model sensitivity of the IRR and NPV to changes in basic factors is reflected in the table below.



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**Table 1-30 IRR and NPV Factors**

<b>Case</b>	<b>Cumulative Net Cash Flow (\$MM)</b>	<b>NPV @5% (\$MM)</b>	<b>NPV @10% (\$MM)</b>	<b>Payback (Years)</b>	<b>IRR (%)</b>
<b>Base Case</b>	3,256	1,521	650	5.6	18.7
<b>Metal Price Variation</b>					
Metal Price + 20%	4,880	2,447	1,249	4.0	25.5
Metal Price +10%	4,068	2,000	951	5.8	22.2
Metal Price -10%	2,451	1,045	350	6.3	14.9
Metal Price -20%	1,643	563	43	8.3	10.6
<b>Mill Recovery Variation</b>					
Mill Recovery +20%	4,585	2,304	1,141	4.3	24.3
Mill Recovery +10%	3,924	1,916	898	5.3	21.6
Mill Recovery -10%	2,600	1,133	405	5.8	15.6
Mill Recovery -20%	1,933	737	154	7.1	12.2
<b>Operating Cost Variation</b>					
Operating Cost +20%	2,766	1,210	439	5.9	15.8
Operating Cost +10%	3,011	1,366	545	6.2	17.3
Operating Cost -10%	3,501	1,677	754	5.6	20.1
Operating Cost -20%	3,746	1,831	858	5.2	21.5
<b>Capital Cost Variation</b>					
Capital Cost +20%	3,090	1,367	507	6.5	16.1
Capital Cost +10%	3,173	1,444	579	6.0	17.3
Capital Cost -10%	3,338	1,597	720	4.9	20.2
Capital Cost -20%	3,420	1,673	790	5.3	22.0
<b>Compressed Schedule</b>					
SAG #1 starts 1/1/09	3,261	1,617	757	4.8	20.7
SAG #2 starts 1/1/11					

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p) Payback

Based on the cash flow schedule in the previous section it can be seen that the payback of the initial capital investment will be realized in 5.6 years for the base case.

q) Mine Life

The proven and probable reserves identified at present, together with the selected production rate result in a mine life of 17 years.

r) Financial Model Summary

See Table 1-31.

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**Table 1-31 Financial Model Summary**

Silver Price \$/oz =		\$ 8.841	Gold Price \$/oz =		\$ 532.740	Price		1.00		
Silver Price \$/g =		\$ 0.284	Gold Price \$/g =		\$ 17.128	Factor				
2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
365	365	365	365	365	365	365	365	365	365	365
20,898	4,668	6,577	4,279	1,784	272	253	0	0	2,084	
18,250	18,250	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500
59,852	116,082	135,923	138,221	140,716	142,228	142,247	142,500	142,500	123,716	
1.53	5.07	3.16	3.39	3.68	3.87	3.87	3.90	3.90	3.21	
20,898	4,668	6,577	4,279	1,784	272	253	0	0	2,084	
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0.30	0.27	0.30	0.42	0.64	1.03	1.34	0.00	0.00	0.27	
25.18	24.66	20.99	19.84	25.52	21.18	36.52	0.00	0.00	14.03	
18,250	18,250	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500
0.31%	0.30%	0.29%	0.27%	0.28%	0.32%	0.31%	0.31%	0.33%	0.40%	
0.54%	0.52%	0.65%	0.56%	0.56%	0.62%	0.69%	0.68%	0.78%	0.89%	
0.26	0.28	0.42	0.38	0.49	0.71	0.85	0.80	0.86	0.67	
23.68	21.72	26.31	24.59	27.76	32.12	30.91	28.54	31.87	35.47	
82	79	152	142	145	168	162	160	173	208	

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152	143	354	299	291	330	367	358	420	454
40	39	74	69	70	82	79	77	84	98
91	98	295	264	336	494	582	555	596	391
8,734	7,974	19,264	17,947	19,817	23,306	22,224	20,465	23,017	23,900
65	61	150	127	124	140	156	152	179	193
12	14	42	38	51	76	90	85	91	64
1,210	1,100	2,635	2,519	2,864	3,389	3,126	2,837	3,150	3,236
100	20	32	29	18	5	5	0	0	9
4,737	1,036	1,243	764	410	52	83	0	0	207
40	39	74	69	70	82	79	77	84	98
65	61	150	127	124	140	156	152	179	193
6,288	4,103	11,462	10,300	12,599	17,869	21,072	19,903	21,360	14,437
203	132	369	331	405	575	677	640	687	464
455,911	314,287	719,590	660,231	718,133	831,924	791,032	724,779	813,888	850,404
14,657	10,105	23,136	21,226	23,089	26,747	25,433	23,302	26,167	27,342

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\$ 161,048	\$ 185,893	\$ 66,302	\$ 57,600	\$ 2	\$ 2,988	\$ 26,758	\$ 11,755	\$ 3,695	\$ 9,160
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 10,498	\$ (2,000)	\$ 14,000	\$ 1,000	\$ 1,000	\$ 6,000	\$ 3,000	\$ (1,000)	\$ 3,000	\$ (1,000)
\$ 351,513	\$ 314,209	\$ 658,533	\$ 663,063	\$ 691,639	\$ 833,783	\$ 918,338	\$ 890,564	\$ 968,000	\$ 927,495
\$ 223,750	\$ 228,646	\$ 396,727	\$ 383,268	\$ 397,747	\$ 415,783	\$ 425,142	\$ 429,019	\$ 433,945	\$ 436,681
\$ 6,000	\$ 5,000	\$ 10,000	\$ 11,000	\$ 11,000	\$ 14,000	\$ 15,000	\$ 15,000	\$ 16,000	\$ 15,000
\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 177,732	\$ 171,104	\$ 131,590	\$ 116,978	\$ 76,717	\$ 31,723	\$ 21,837	\$ 10,376	\$ 11,299	\$ 12,842
\$ 407,532	\$ 404,800	\$ 538,367	\$ 511,296	\$ 485,514	\$ 461,556	\$ 462,029	\$ 454,445	\$ 461,294	\$ 464,573
\$ (56,019)	\$ (90,591)	\$ 120,166	\$ 151,767	\$ 206,125	\$ 372,227	\$ 456,309	\$ 436,119	\$ 506,706	\$ 462,923
\$ (389,920)	\$ (445,939)	\$ (536,530)	\$ (416,364)	\$ (264,598)	\$ (58,472)	\$	\$	\$	\$
\$	\$	\$	\$	\$	\$ 87,851	\$ 127,767	\$ 122,113	\$ 141,878	\$ 129,618
\$ (56,019)	\$ (90,591)	\$ 120,166	\$ 151,767	\$ 206,125	\$ 284,376	\$ 328,542	\$ 314,006	\$ 364,828	\$ 333,305
\$ (55,861)	\$ (117,641)	\$ 121,729	\$ 150,572	\$ 212,284	\$ 304,721	\$ 238,715	\$ 241,285	\$ 301,955	\$ 313,235

\$ (718,831) \$ (836,472) \$ (714,742) \$ (564,170) \$ (351,886) \$ (47,165) \$ 191,550 \$ 432,835 \$ 734,790 \$ 1,048,025

\$ 229,000 \$ 221,000 \$ 564,000 \$ 507,000 \$ 567,000 \$ 720,000 \$ 779,000 \$ 741,000 \$ 821,000 \$ 729,000

\$ 12.55 \$ 12.11 \$ 15.45 \$ 13.89 \$ 15.53 \$ 19.73 \$ 21.34 \$ 20.30 \$ 22.49 \$ 19.97

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Corporation

GLAMIS GOLD LTD.  
 100,000 mtpd Minera Peñasquito Feasibility Study  
 Volume I

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M3-PN06089  
 31 July 2006

M3 Engineering & Technology Corporation

**Figure 1-1 National Transportation Corridors**

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**Figure 1-2**  
**Project State Plan**

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**Figure 1-3 Project Region Plan**

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**Figure 1-4 Project Vicinity Plan**

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**Figure 1-5 Project Facilities Plan**

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**Figure 1-6 Sulphide Mill**

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**Figure 1-7 Peñasquito Mineral Concessions**

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**Figure 1-8 Private and Ejido Surface Ownership**

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**Figure 1-9 Local Geology**

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**Figure 1-10A Peñasco Drill Hole Traces**

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**Figure 1-10B Chile Colorado Drill Hole Traces**

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**Figure 1-11 Peñasco and Chile Colorado Pit Plan**

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**Figure 1-12 North-South Cross Section Peñasco Pit**

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**Figure 1-13 East-West Cross Section Chile Colorado Pit**

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**Figure 1-14 Peñasco Open Pit Phases 1 7**

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**Figure 1-15 Chile Colorado Open Pit Phases 1 3**

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**Figure 1-16 Project Schedule**

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**Figure 1-17 Project Perspective**

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**Figure 1-18 Mill Area Perspective**

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**Figure 1-19 Grinding Area Elevation**

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**Figure 1-20 Financial Sensitivities Peñasquito After-Tax IRR Sensitivity**

Capital Cost (Mine & Process) Metal Recovery Operating Cost (Mine & Process) Metal Prices Early Expansion (2011)

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**Figure 1-21 Annual Payable Gold Metal**

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**Figure 1-22 Annual Payable Silver Metal**

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**Figure 1-23 Annual Payable Lead Metal**

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**Figure 1-24 Annual Payable Zinc Metal**

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**Figure 1-25 Mining Production**

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**Figure 1-26 Cash Flow Summary**

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**Figure 1-27 Operating Cost**

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GLAMIS GOLD LTD.  
 100,000 mtpd Minera Peñasquito Feasibility Study  
 Volume I

**APPENDIX A**  
**Professional Qualifications**

**DESCRIPTION**

Professional Qualifications

Certificate of Qualified Person and Consent of Author

Résumés of Principal Authors

Responsibility	Qualified Person	Registration	Company
Resource Modeling	James S. Voorhees	P.E.	Glamis
Mine Planning	James S. Voorhees	P.E.	Glamis
Reserves	James S. Voorhees	P.E.	Glamis
Geology	Charlie Ronkos	Corporate	Glamis
Metallurgical Testing	Jerry Hanks	P.E.	Independent
Flow Sheets	Tom Drielick	P.E.	M3 Engineering
Pit Geotechnical	Tom Wythes	P.E.	Golder Assoc.
Process Plant and Costing	Conrad Huss	P.E.	M3 Engineering
Foundation Design	Michael Pegnam	P.E.	Golder Assoc.
Tailings	Jim Johnson	P.E.	Golder Assoc.

A-1

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**CONSENT OF EXPERTS**

We hereby consent to the reliance in this Registration Statement on Form F-10 of Glamis Gold Ltd. ( Glamis ) on our report entitled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006, which was commissioned by Glamis. We also consent to the reference to us under the headings Summary Description of the Business and Experts in such Registration Statement.

Conrad E. Huss, P.E., Ph.D.

Date: July 25, 2006

Jerry T. Hanks, P.E.

/s/ Jerry T. Hanks, P.E.

Date: July 25, 2006

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**CONSENT OF EXPERTS**

We hereby consent to the reliance in this Registration Statement on Form F-10 of Glamis Gold Ltd. ( Glamis ) on our report entitled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006, which was commissioned by Glamis. We also consent to the reference to M3 Engineering Technology Corporation under the headings Summary Description of the Business and Experts in such Registration Statement.  
M3 Engineering Technology Corporation

By:  
Name: Conrad E. Huss  
Title: Executive Vice  
President

Date: July 25, 2006

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**GLAMIS GOLD LTD.**

5190 Neil Road, Suite 310

Reno, NV 89502

phone: (775) 827-4600 fax: (775) 827-5044

jamesv@glamis.com

**CERTIFICATE OF QUALIFIED PERSON**

**James S. Voorhees**

1. I, James S. Voorhees, P.Eng., am a Professional Engineer and Vice President and Chief Operating Officer of Glamis Gold Ltd. of Reno, Nevada.
  2. I am a member of the Society for Mining, Metallurgy and Exploration Inc., a member society of the American Institute of Mining, Metallurgical and Petroleum Engineers Inc.
  3. I graduated from the University of Nevada-Reno in 1976, with a Bachelor of Science degree in Mining Engineering. I have practised my profession continuously since 1976 except for a 20-month period beginning in 1984 when I held management positions outside of the mining industry.
  4. Since 1976 I have held positions in the mining industry:
    - (a) in surface and underground coal mining, both in engineering, construction, operating and management roles through 1984;
    - (b) in surface and underground metals mining from 1986 until the present, in engineering, construction, operating and management roles, including Engineering Manager for Santa Fe Pacific Gold Company (1992-1994), General Manager of the Mesquite Mine in California (1995-1996), and General Manager of the Twin Creeks Mine in Nevada (1997);
    - (c) as Director of Project Development for Newmont Mining Corporation (1997-1999).
  5. As a result of my experience and qualifications I am a Qualified Person as defined in National Instrument 43-101.
  6. I am presently Executive Vice President and Chief Operating Officer for Glamis Gold Ltd.
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- 2 -

7. In April 2006 I visited the Peñasquito project site to review geology, exploration samples, project setting, and infrastructure requirements.
8. The July 2006 100,000 tpd Peñasquito Project feasibility update Resource and Reserve calculations were prepared under my direct supervision by the following technical specialist:
  - (a) Robert Bryson, a Mining Engineering graduate from the University of Nevada-Reno, Mr. Bryson has over 20 years experience in various aspects of mining including ore reserve estimation, mining methods, and mine development;
9. I am not aware of any material fact or material change with respect to the subject matter which is not reflected in this report, the omission to disclose which would make this report misleading.
10. I have read National Instrument 43-101, Form 43-101F1 and this report has been prepared in compliance with NI 43-101 and Form 43-101F1.

Dated this 26<sup>th</sup> day of July, 2006.

/s/ James S. Voorhees

James S. Voorhees, P.Eng.,

Executive Vice President and Chief Operating  
Officer

QUALIFIED PERSON

---



**James S. Voorhees**  
Glamis Gold Ltd.  
5190 Neil Rd. Suite 310  
Reno, NV 89502 USA  
Phone 775-827-4600 / Fax 775-827-5044  
**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.  
British Columbia Securities Commission  
Alberta Securities Commission  
Saskatchewan Securities Commission  
Manitoba Securities Commission  
Ontario Securities Commission  
Autorité des marchés financiers du Québec  
Nova Scotia Securities Commission  
New Brunswick Office of the Administrator of Securities  
PEI Provincial Affairs & Attorney General  
Department of Government Services and Lands, Government of Newfoundland and Labrador  
The Toronto Stock Exchange

I, James S. Voorhees, do hereby consent to the filing by Glamis Gold Ltd. (the Company ) of the technical report titled Peñsquito Feasibility Study 100,000 MTPD dated July 27, 2006 (the Technical Report ) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the written disclosure in the news release of the Company dated June 21, 2006 relating to the subject matter of the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 26<sup>th</sup> day of July, 2006.

/s/ James S. Voorhees

Signature of Qualified Person

James S. Voorhees

Name of Qualified Person

---

**Jerry T. Hanks P.E.**

7307 W. Mesquite River Drive

Tucson, Arizona 85743 USA

Phone: 520-579-9720

Email: [jerryhanks@hotmail.com](mailto:jerryhanks@hotmail.com)

**CERTIFICATE OF QUALIFIED PERSON**

I, Jerry T. Hanks, P.E, do hereby certify that:

1. I am self-employed as a metallurgical and mineral processing engineer. My office is located at 7307 W. Mesquite River Drive, Tucson, Arizona 85743 USA.
  2. I am a graduate of the Colorado School of Mines with the degree of Metallurgical Engineer, 1963.
  3. I am a registered professional engineer in good standing in the states of Arizona (#21106) and Colorado (#10042), USA, I am a member in good standing of the Society of Mining, Metallurgy, and Exploration (SME.)
  4. I have practiced metallurgical and mineral processing engineering for 43 years. I worked for mining and exploration companies including ASARCO, AMAX, and Phelps Dodge Exploration (PDX) for thirty years and for engineering companies (The Ralph M. Parsons Company and E&C International) for seven years. I have been self-employed for six years following retirement from PDX in 1999.
  5. I have read the definition of "qualified person" set out in National Instrument 43-101 ( NI 43-101 ) and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
  6. I am responsible for the preparation of Section 5, "Metallurgy," of the technical report titled "Peñasquito Feasibility Study 100,000 MTPD" dated July 31, 2006. I also oversaw the 2003-2005 process design test work. I visited the Peñasquito property on August 25 - 27, 2004.
  7. I have had prior involvement with the Peñasquito property that is the subject of Teckical Report. The nature of my prior involvement is preparation of Section 5 of a "Pre-Feasibility Study" dated March 2004.
  8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Teckical Report, the omission to disclose which makes the Technical Report misleading.
-

- 2 -

9. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.
10. I have read National Instrument 43-101, and certify that Section 5 of the Technical Report has been prepared in compliance with that instrument.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 26 Day of July 2006.

/s/ Jerry T. Hanks

Signature of Qualified Person

Jerry T. Hanks, PE

Print name of Qualified Person

---

**Jerry T. Hanks P.E.**

7307 W. Mesquite River Drive

Tucson, Arizona 85743 USA

Phone: 520-579-9729

Email: [jerryhanks@hotmail.com](mailto:jerryhanks@hotmail.com)

**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.

British Columbia Securities Commission

Alberta Securities Commission

Saskatchewan Securities Commission

Manitoba Securities Commission

Ontario Securities Commission

Autorité des marchés financiers du Québec

Nova Scotia Securities Commission

New Brunswick Office of the Administrator of Securities

PEI Provincial Affairs & Attorney General

Department of Government Services and Lands, Government of Newfoundland and Labrador

The Toronto Stock Exchange

I, Jerry Hanks, do hereby consent to the filing by Glamis Gold Ltd. (the Company) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006 (the Technical Report) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 26 day of July, 2006.

/s/ Jerry Hanks

Signature of Qualified Person

Jerry Hanks. PE

Name of Qualified Person

---

**JERRY HANKS, P.E.**  
**Mineral Processing Engineer**

**EDUCATION** Colorado School of Mines, Metallurgical Engineer, 1963

**REGISTRATION** Arizona and Colorado

**EXPERIENCE** Forty (40) years of experience in exploration, mineral property evaluation, process development, project management, due diligence, feasibility studies, startups, plant operations and maintenance.

**PROJECT EXPERIENCE**

Mineral Processing Consultant (15 years)

Provided process engineering for a copper-cobalt project in the Democratic Republic of Congo, for Phelps Dodge Corporation.

Managed a pre-feasibility study for the Cobre del Mayo Piedras Verdes Copper Project in Sonora, Mexico.

Provided technical assistance on a copper heap leach project to a confidential client.

Managed process development work and assisted with a bankable feasibility study for the Sossego Copper-Gold Project in Brazil, for Companhia Serra do Sossego.

Assisted CVRD with evaluating test programs for the Vermelho nickel-cobalt laterite project in Brazil.

Managed worldwide process development and engineering studies for Phelps Dodge Exploration Corporation. Assisted the Strategy and Business Development Group in evaluating properties for potential acquisitions, joint ventures, and licensing.

Managed process development work and assisted with a prefeasibility study for a world class copper-gold project being developed in the Amazon Basin of Brazil.

Evaluated the Las Cruces lead-zinc property in Bolivia as a possible acquisition for Phelps Dodge.

Directed process testwork and metallurgical evaluation for the Piedras Verdes heap leach, SX/EW copper project in Mexico.

Managed process development work for a large nickel-cobalt laterite deposit in Madagascar. Also acted as technical study manager during the bankable feasibility study for this \$800 million project.

Acted as team leader for a joint Exxon-Phelps Dodge evaluation of the Crandon lead- zinc project in Wisconsin.

Oversaw testwork and managed a scoping study on the Jerome zinc-copper-gold project in Arizona, for Phelps Dodge.

Evaluated a zinc concentrator and zinc refinery in Tennessee as a possible acquisition for Phelps Dodge.

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Managed both the process development work and the feasibility study for the La Candelaria Project, a highly successful \$500 million dollar copper project in Chile.

Developed standard practices for testing and evaluating exploration properties, thereby improving management's ability to choose between projects competing for limited exploration funds.

Served as a member of the Phelps Dodge Concentrator and Hydrometallurgy Steering Teams.

---

**JERRY HANKS, P.E.**

**Mineral Processing Engineer**

E&C International Chief Metallurgist (3 years)

Wrote the control system manuals in Spanish for the new Cananea Concentrator. Assisted with startup and trouble shooting in both the new and old concentrators.

Performed in-plant consulting, trouble shooting, and de-bottlenecking at the Real de Angeles lead-zinc concentrator in Zacatecas, Mexico

Designed, supervised fabrication, and commissioned the first two flotation columns installed in Mexico, for the Real de Angeles lead-zinc plant.

Ralph M. Parsons Company, Principal Process Engineer (5 years)

Performed process design and engineering for the Cominco Red Dog lead-zinc concentrator in Alaska.

Assisted with startup of a SAG mill / copper concentrator project in Chile.

Performed both process and project engineering for a feasibility study for an 84,000 ton /day copper concentrator project also in Chile.

Provided in-plant trouble shooting and de-bottlenecking for the Molycorp plant at Questa, NM.

The Southern Peru Copper Corporation, Assistant Mill Superintendent (2 years)

Oversaw operations, maintenance, and metallurgy for the 45,000 ton /day copper-moly concentrator in Toquepala, Peru.

Climax Molybdenum Company, Shift Boss, Sr. Metallurgist, Mine-Mill Design Engineer, Mill Superintendent (10 years)

Supervised production at the Climax moly-oxide recovery plant and at the Henderson Concentrator.

Managed all process development work for the Henderson Project.

Acted as Climax's representative to the engineering company during detailed design of mine, mill, and infrastructure facilities for the Henderson Project.

Earlier positions include: Mill Superintendent and Advisor to the Black Sea Copper Company in Turkey; General Mill Foreman for Molycorp, Questa; Junior Metallurgist and Shift Boss for ASARCO copper concentrators at Mission and Silver Bell, Arizona. At Mission, worked on the process development team for the lead-zinc-moly byproducts plant.

**LANGUAGES**

Spanish

Portuguese

French (Some)

**PUBLICATIONS**

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**JERRY HANKS, P.E.**

**Mineral Processing Engineer**

Sampling a Mineral Deposit and Metallurgical Testing for the Design of Comminution and Mineral Separation Processes (co-author) presented at the SME Symposium on Mineral Processing Design, Vancouver, BC Canada, October 20-24, 2002

Nickel and Cobalt Recovery from Madagascar Laterite, (co-author) presented at the Pressure Technology and Applications in Hydrometallurgy of Copper, Nickel, Cobalt and Precious Metals Symposium, TMS Annual Meeting, Nashville, 2000.

Development of Nickel/Cobalt Precipitation Process from Laterite Pressure Acid Leach Liquor, (co-author) presented at the ALTA Nickel/Cobalt Pressure Leaching & Hydrometallurgy Forum, Perth, 1999.

Process Development for Exploration Projects, presented at the SME Annual Meeting, Denver, 1997.

Metallurgical Development at Phelps Dodge's Ojos del Salado Concentrator in Chile Since 1982, (co-author) presented at the SME Annual Meeting, Reno, 1993. Also published in *Mining Engineering*, December 1993 (cover story).

Designing Semiautogenous Grinding Installations for Effective Maintenance, presented at the Annual Meeting of the Arizona Conference of AIME, Tucson, 1986.

Maintenance Considerations in the Design and Operation of Autogenous Mills, (co-author) presented at Primer Taller de Molienda Autogena de Minerales, Santiago de Chile, 1983.

The Grinding and Flotation Investigation of Henderson Ore (co-author) presented at the SME Annual Meeting, Reno, 1971.

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**Thomas L. Drielick, PE**  
M3 Engineering & Technology Corp.  
2440 W. Ruthrauff Rd., Suite 170  
Tucson, AZ 85705 USA  
Phone: 520-293-1488 / Fax 520-293-8349  
**CERTIFICATE OF QUALIFIED PERSON**

I, Thomas L. Drielick, P.E, do hereby certify that:

1. I am employed as a metallurgist and project manager at M3 Engineering & Technology Corp. located at 2440 W. Ruthrauff, Tucson, Arizona 85705 USA.
  2. I am a graduate of Southern Illinois University and Michigan Technological University.
  3. I am a registered professional engineer in good standing in the state of Arizona (#22958)
  4. I have practiced metallurgical engineering for 36 years. I worked for U.S. Army, Metallurgical Engineer (3 Years); Kennecott Corporation, Process Engineer, Plant Metallurgical Engineer, Operations Foreman (8 Years); Newmont Mining Corporation, Project Manager and Project Engineer (8 Years); M3 Engineering & Technology, Project Manager and Metallurgist (17 Years)
  5. I have read the definition of "qualified person" set out in National Instrument 43-101 ( NI 43-101 ) and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
  6. I am responsible for the preparation of Section 6 of the technical report titled "Peñasquito Feasibility Study 100,000 MTPD" dated July 31, 2006. I have not visited the Peñasquito property.
  7. I have had prior involvement with the Peñasquito property that is the subject of the technical report. The nature of my prior involvement is preparation of Section 5 of a "Pre-Feasibility Study" dated March 2004.
  8. I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the technical report, or an omission to disclose which makes the technical report misleading.
  9. I have read National Instrument 43-101, and certify that Section 6 of the technical report has been prepared in compliance with that instrument.
-

- 2 -

10. I consent to the filing of the technical, report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the technical report.

Dated this 27<sup>th</sup> Day of July 2006.

/s/ Thomas L. Drielick

Signature of Qualified Person

Thomas L. Drielick, PE

Print name of Qualified Person

---

**Thomas L. Drielick, PE**  
M3 Engineering & Technology Corp.  
2440 W. Ruthrauff Rd., Suite 170  
Tucson, AZ 85705 USA  
Phone: 520-293-1488 / Fax 520-293-8349

**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.  
British Columbia Securities Commission  
Alberta Securities Commission  
Saskatchewan Securities Commission  
Manitoba Securities Commission  
Ontario Securities Commission  
Autorité des marchés financiers du Québec  
Nova Scotia Securities Commission  
New Brunswick Office of the Administrator of Securities  
PEI Provincial Affairs & Attorney General  
Department of Government Services and Lands, Government of Newfoundland and Labrador  
The Toronto Stock Exchange

I, Thomas L. Drielick, do hereby consent to the filing by Glamis Gold Ltd, (the Company ) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006 (the technical report ) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the technical report and I do not have any reason to believe that there are any misrepresentations in the information derived from the technical report or that the written disclosure contains any misrepresentation of the information contained in the technical report.

Dated as of the 27<sup>th</sup> day of July, 2006

/s/ Thomas L. Drielick

Signature of Qualified Person

Thomas L. Drielick, PE

Name of Qualified Person

---

**THOMAS L. DRIELICK, P.E.**

**Project Engineer**

**EDUCATION**

M.B.A., Southern Illinois University  
B.S., Engineering, Michigan Technological University

**REGISTRATION**

Engineer Arizona

**EXPERIENCE**

Over thirty-two (32) years of professional management and engineering experience in plant operations, project management, budget control, quality/schedule control, bid evaluations, planning, design development, process flowsheets, and project evaluations. Experience has been international with projects in the U.S.A., Canada, Mexico, Central America, Argentina, Chile, Peru and Australia. Over 100 computerized simulations of flowsheets for ore processing (precious and base metals), chemical plants and water treatment, O&M estimates for reclamation closure/closeout projects.

**PROJECT EXPERIENCE**

**M3 Engineering & Technology**, Project Manager and Metallurgist (15 Years)

Pan American Silver, Manatíal Espejo, Mexico

Pan American Silver, Alamo Dorado, Mexico

Alamos Mulatos Gold, Sonora, Mexico

Western Silver Peñasquito Flowsheets, Zacatecas, Mexico

Minefinders Dolores Gold Plant, Chihuahua, Mexico

AVESTOR Battery Plant

APC RIMOD 3 Modernization of Cement Plant

ASARCO Mission Crushing Plant Upgrade

Kerr-McGee Manganese Dioxide Chemical Plant

Kerr McGee Physical Separation Facility including new chemical lime water treatment facility

Kerr McGee West Chicago Remediation and Reclamation

BHP Magma Anode Preparation Plant and Gold Concentrator

BHP Magma Miami Unit SX-EW Organic Recovery

BHP Magma San Manuel Selenium Recovery Circuit

Battle Mountain Gold Crown Jewel Project

Chemical Lime Apex Quicklime Handling

ASARCO Ray SAG Mill Bypass Study

ASARCO Ray Secondary Crushing Project

ASARCO Ray Tankhouse Upgrade Project Chemstar Cosgrave Lime Crushing and Kiln

Chemstar Tenmile Pass Lime Crushing & Kiln, Soda Springs, Idaho

Coeur d Alene Mines Corporation Boleo Project

Cyprus Bagdad Expansion Studies

Cyprus Bagdad Mineral Park SX-EW

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**THOMAS L. DRIELICK, P.E.**

**Project Engineer**

M3 Engineering & Technology (continued)

Cyprus Bagdad 3000 Cu. Ft. Rougher Expansion

Cyprus Bagdad Tonopah Mills and Cells

BHP Magma Pinto Valley No. 4 Tailing Reclaim Water System

BHP Magma Pinto Valley Tailing Pump Station

BHP Magma San Manuel Smelter Flue Dust Leach and SX Plant

Majdanpek Flotation Mill Expansion/Modernization

Cyprus Bagdad WaterFlush Crushing Plant

Cyprus Casa Grande Silver Leaching

Cyprus Cerro Verde Crush/Convey Upgrade Project

Cyprus Tohono Oxide Ore Process Plant

Cyprus Tonopah SX-EW Study

Cyprus Sierrita Copper Larox Pressure Filter Installation

Cyprus Sierrita Moly Expansion Support

Cyprus Sierrita Molybdenum Chemicals ADM Plant

Cyprus Sierrita Roll Crusher Plant Addition

Cyprus Sierrita Rhenium Plant Expansion

Echo Bay Gold Aquarius Project including water system

Echo Bay McCoy Gold Crushing/Grinding

Echo Bay Paredones Amarillos Project including water system

Francisco Gold El Sauzal Project

Geomaque San Francisco Gold Project

Golden Queen Mining Soledad Mountain Project ,

Granite Swan Road Sand and Gravel Plant

Griffin Copper Bale Leach

Griffin Copper Plant Expansion

Grupo Mexico Cananea Raffinate Neutralization Project

Hecla KT Clay Monterrey Expansion Project

Hecla La Choya Gold Heap Leach

Hecla Lucky Friday Mill Expansion

Hecla Noche Buena Gold Plant Study

Hecla Rosebud Gold Project including reverse osmosis water treatment

Kennecott Carmen Feasibility Project

Kennecott Sweetwater Uranium Water Recycle Project

Kennecott Greens Creek Recommission Project including three new chemical lime water treatment projects facilities

Kennecott Greens Creek Pyrite Circuit Study for Reclamation

Kennecott Greens Creek Mill Enhancements Study

Kennecott Greens Creek Cleaner Flotation Project

---

**THOMAS L. DRIELICK, P.E.**

**Project Engineer**

M3 Engineering & Technology (continued)

Kennecott Utah Lime Plant

Liximin/Golden News Luz del Cobre

Maricunga Refugio Gold Operation Consulting

Minera Alumbreira Prefeasibility Study, Gold/Copper Argentina

Minera Alumbreira Grinding Line No. 3 Project

Minera Alumbreira Filter Plant

Minera Alumbreira Crusher/Mill Upgrades

Minera Alumbreira Mill Expansion Study

Minera Las Cuevas Fluorspor Calcination and Leaching

Minera Penmont La Herradura Gold Project

Molycorp Mt. Pass Rare Earth Minerals Crushing Plant

Morgain Minera MGM Trona Study

Newmont Gold Company Gold Mine Dewatering

Phelps Dodge New Mexico Properties Reclamation Plan

Peñoles Fco. I Madero Project

Peñoles Fresnillo Grinding Expansion Project

Phelps Dodge Standard Low Cost SX-EW Study

Phelps Dodge Arizona Properties Reclamation Plans (7)

Phelps Dodge Ajo Concentrator Project

Phelps Dodge Chino Waterflush Crusher

Phelps Dodge Morenci Coronado Lead Project

Phelps Dodge Morenci Metcalf 82,000 TPD Expansion Study



Phelps Dodge Morenci Fine Grind Expansion Study

Phelps Dodge Morenci Flotation Expansion

Phelps Dodge Morenci Secondary Crushing Study

Phelps Dodge New Mexico Reclamation Plans (3) including water treatment

Phelps Dodge Tyrone SXEW Raffinate Tank

Pinal Creek Group EPCM

Pinal Creek Group Water Treatment Trade-Off Study

Pinal Creek Group Water Treatment Pilot Plant

Placer Dome Cortez In-pit Sizing and Conveying Study

Placer Dome Mulatos Gold Project

Questa Water Treatment Study

Teck Cominco Morelos Camp Gold Plant Feasibility Mexico

Tucson Electric Power Springerville Lime Plant Study

Zinc Corporation of America Zinc Sulfide Leach Plant Upgrade

---

**THOMAS L. DRIELICK, P.E.**

**Project Engineer**

Newmont Mining Corporation, Project Manager and Project Engineer (8 Years)

Idarado Mining Company: Copper tailing pond dust suppression

Limestone preparation plant evaluation

Magma Copper Company: Copper concentrate drying evaluation

Magma Copper Company: Copper slag concentrator project evaluation

NHPL Telfer; Australia: Gold plant expansion evaluation

NMC, Uchuchaqua: Silver plant expansion evaluation

NML, Similkameen: Copper plant expansion evaluation

Newmont Mining Corporation, Project Manager and Project Engineer (continued)

NML, Similkameen: Copper tailing disposal modifications

New Celebration Gold Mine, Australia: Gold plant expansion project

Newmont Gold Company, Gold Quarry: Gold dump leach crushing plant evaluation

Newmont Gold Company, Gold Quarry: Gold dump leach for 3 MM TYP

Newmont Gold Company, Maggie Creek: Gold leach solution heating evaluation

Newmont Gold Company, North Area: Gold heap leach and carbon in pulp

Newmont Gold Company, No. 1 Mill: Gold plant expansion

Newmont Gold Company, No. 2 Mill: Gold milling facility for 7,000 TPD

Newmont Gold Company, No. 2 Mill: Gold plant expansion evaluation

Newmont Gold Company, Rain: Gold project evaluation

Kennecott Corporation, Process Engineer, Plant Metallurgical Engineer, Operations Foreman (7 Years)

Chino Division: Copper, Molybdenite milling facility for 37,000 TPD

Chino Division: Copper solvent extraction electrowinning process development

Nevada Division: Copper tailing recovery and re-treatment evaluation

Ray Division: Copper solvent extraction project evaluation

Tintic Division: Lead, Zinc Responsible for the concentrator metallurgical performance, production budget, quality standards, and development of process treatment methods

Utah Division: Copper, Molybdenite concentrator metallurgist responsibilities included commissioning of new process facilities, training plant operators, solving production problems

Copper, Molybdenite modernization project development/evaluation

Utah Copper Division: Molybdenite plant project development/evaluation

Utah Division: Copper, Molybdenite shift supervisor of crushing, grinding & flotation circuits

U.S. Army, Metallurgical Engineer (3 Years)

Frankford Arsenal, Metallurgical engineering research programs in the area of metal fragmentation and liquid metal embrittlement

**COURSES**

Completed MSHA Training

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**Golder Associates Inc.**

1103 North Hudson St.

Silver City, NM 88061

phone: (505) 388-0118 fax: (505) 388-0120

twythes@golder.com

**CERTIFICATE OF QUALIFIED PERSON**

**Thomas J. Wythes**

1. I, Thomas J. Wythes, P.E., P.G. am a Professional Engineer, Professional Geologist, and Senior Engineer of Golder Associates Inc. of Tucson, Arizona.
  2. I am a member of the Society for Mining, Metallurgy and Exploration Inc. and the Geological Society of Arizona.
  3. I graduated from the University of Washington in 1980 with a Bachelor of Science degree in Geological Sciences and from the University of Nevada-Reno in 1993 with a Master of Science degree in Geological Engineering. I have practised my current profession continuously since 1993.
  4. I am a Professional Engineer in good standing in the States of Arizona and New Mexico in the area of Geological Engineering. I am also registered as a Professional Geologist in the state of California.
  5. As a result of my experience and qualifications I am a Qualified Person as defined in National Instrument 43-101.
  6. I am responsible for the geotechnical investigation for the report titled Peñasquito Feasibility Study Geotechnical Characterization Report, Heap Leach Facility, Waste Rock Piles, Tailings Impoundment, and Plant Site Foundation Recommendations dated September 22, 2005 and the Peñasquito Feasibility Pit Slope Design Report dated July 15, 2005. These report are included as appendicies to the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27,2006 (the Technical Report ) relating to the Peñasquito Project. I understand that changes have been made to these facilities since the September 22, 2005 report was published and I will have the opportunity to review and revise the geotechnical recommendations based on the new locations of the facilities and the pit geometry as they become available. I visited the Peñasquito property between October 15 and October 19, 2005 and again between November 22 to November 26, 2004
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7. I have had no prior involvement with the property that is the subject of Technical Report.
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Signed at Silver City, New Mexico this 27th day of July 2006.

/s/ Thomas J. Wythes

Thomas J. Wythes. P.E., P.G.  
Senior Engineer  
QUALIFIED PERSON

---

**Thomas J. Wythes**  
Golder Associates Inc.  
1103 North Hudson St.  
Silver City, NM 88061 USA  
Phone: 505-388-0118 / Fax 505-388-0120  
**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.  
British Columbia Securities Commission  
Alberta Securities Commission  
Saskatchewan Securities Commission  
Manitoba Securities Commission  
Ontario Securities Commission  
Autorité des marchés financiers du Québec  
Nova Scotia Securities Commission  
New Brunswick Office of the Administrator of Securities  
PEI Provincial Affairs & Attorney General  
Department of Government Services and Lands, Government of Newfoundland and Labrador  
The Toronto Stock Exchange

I, Thomas J. Wythes, do hereby consent to the filing by Glamis Gold Ltd, (the Company ) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27, 2006 (the Technical Report ) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the written disclosure in the news release of the Company dated June 21, 2006 relating to the subject matter of the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 27<sup>th</sup> day of July 2006.

/s/ Thomas J. Wythes

Signature of Qualified Person

Thomas J. Wythes

Name of Qualified Person

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**Thomas J. Wythes, P.E., R.G**

**Education:** M.S., Geological Engineering, University of Nevada, Reno, 1993  
 B.S., Geological Sciences, University of Washington, Seattle, 1980  
 Short Course, Blast Design, Assessment for Surface Mines and Quarries, October 2000  
 Short Course, River Modeling, Boss International, October 1999  
 Short Course, Applications in Stormwater Management, ASCE, January 1998  
 Short Course, Earthquake Hazards and Critical Facility Siting, AEG, October 1992

**Affiliations:** Professional Engineer (P.E.) Arizona  
 Registered Geologist (R.G.) California  
 Society of Mining, Metallurgy, and Exploration (SME)  
 Arizona Geological Society (AGS)

**Experience:**

1996 to Present **Golder Associates** **Tucson, Arizona**

*Senior Engineer*

Mr. Wythes is responsible for performing and developing geotechnical and geological investigation programs and engineering analyses methods, and providing technical oversight, direction, and management on such projects. His areas of technical expertise include slope stability analyses, pit slope design, rock foundation analyses, surface water hydrology analyses and design, heap leach facility design, tailings dam design, and geologic hazard studies. Mr. Wythes' technical skills have been applied extensively in the mineral industry providing consulting services for mineral exploration, resource delineation, mine facility permitting, design of mine facilities, facility expansions, aquifer protection permit support, and reclamation and closure support.

1994 to 1996 **WESTEC** **Reno, Nevada**

*Staff Engineer*

Responsible for providing geotechnical engineering and design recommendations primarily for mining clients in support of facilities design and various permitting issues. Extensive background in slope stability, surface hydrology, rock mechanics, and geologic hazards.

1989 to 1991 **Consulting Geologist** **Reno, Nevada**

Reviewed mineral property submittals from mineral landholders for mining clients. Generated and evaluated viable mineral exploration targets in Nevada, Oregon, and Arizona and presented these opportunities to mining clients.

1980 to 1989 **Freeport McMoRan Gold Company** **Reno, Nevada**

*Associate Geologist*

Reviewed mineral property submittals. Generated and evaluated viable mineral exploration targets throughout the western U.S. Responsible for the design and oversight of exploration and development drilling programs and interpreted the results to provide recommendations for future action.

**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE    ROCK SLOPES/OPEN PIT MINES**

**Peñasquito Project**

**Zacatecas, Mexico**

Project Manager and lead engineer for feasibility-level pit slope design for a proposed new poly-metallic lead-zinc-silver-gold mine in northeast Zacatecas, Mexico. Investigation activities include oriented coreholes up to 500 m deep and rotary drillholes in shallow alluvium. Responsible for site investigation activities, project management, data compilation, and development of a detailed geotechnical model.

**Copperstone Project**

**Arizona**

Prepared recommendations for geotechnical data collection from surface and underground exploratory core drilling at a proposed underground gold mine in western Arizona. The geotechnical data will be used to support underground development designs. Geotechnical data collection criteria was tailored to the site conditions and factors that will have greatest bearing on designs.

**Veladero Project**

**Argentina**

Coordinated on-site investigation activities for pre-feasibility and feasibility pit slope design study phases of a proposed new gold mine. Investigation activities included oriented coreholes up to 550 m deep and optical televiewer surveys of core and rotary drillholes. Other investigation activities included surface and subsurface geotechnical mapping and point load testing.

**Cananea Mine**

**Sonora, Mexico**

Project Manager for a review of pit slopes to evaluate the validity of slope designs based on a study completed 25 years previously. Review was initiated to support a major expansion of the pit that would expose previously uncharacterized geologic and geotechnical units. The project was put on indefinite hold after completion of Phase 1 due to low copper prices.

**El Sauzal Project**

**Chihuahua, Mexico**

Lead engineer for ongoing bankable feasibility-level pit slope study for a proposed new open pit with ultimate highwalls up to 300 m. The investigation included review of available existing data, oriented core drilling, surface mapping, and development of geotechnical model.

**Morenci Mine**

**Morenci, Arizona**

Project Manager and lead engineer for feasibility-level pit slope design of a new open pit with ultimate highwalls up to 2,200 feet. The investigation included oriented core drilling, cell mapping, bench face mapping, compilation of client's geotechnical database, and geologic and hydrologic model. Slope optimization recommendations included a controlled blasting program and slope dewatering.

**San Manuel Mine**

**San Manuel, Arizona**

Provided pit slope design recommendations for a major expansion of an existing open pit mine. Unique design considerations included the presence of a subsurface block cave that will be exposed by the pit expansion and an in-situ leach operation that is to be resumed upon completion of the expansion. A large existing database was available from the operator that was compiled and incorporated into the design recommendations.

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**Thomas J. Wythes, P.E., R.G**

**La Granja Mine**

**Peru**

Involved in many phases of the proposed La Granja open pit mine slope stability study. The design was based on an extensive mapping, sampling, and testing program to develop statistical rock strength and discontinuity parameters that were incorporated into a reliability-based design. Special design considerations included exceptionally high walls in excess of 3,500 feet and extreme groundwater conditions. The project's success required the incorporation of groundwater hydrology, ore reserve calculation models, leach pad and waste dump siting, and the integration of these considerations on pit stability.

**San Francisco Mine**

**Sonora, Mexico**

Completed a preliminary pit slope design for a major expansion of an existing open pit gold mine. Detailed cell mapping of existing pit walls and laboratory rock testing were performed in support of the project. High material strengths and relatively low overall slope heights resulted in a primarily structurally controlled pit design. The project was designed using a reliability-based procedure. Statistical rock strength parameters were generated for relevant lithologies.

**Imperial Project**

**Winterhaven, California**

Completed preliminary pit slope design for two proposed open pits with highwalls in excess of 800 feet. The project was designed using a reliability-based procedure. Final pit geology maps were prepared from available drill data. Statistical rock strength parameters were generated for relevant lithologies.

**Sleeper Mine**

**Winnemucca, Nevada**

Performed emergency response investigation of an incipient pit slope failure involving a large non-daylighted wedge. Detailed investigation and analysis of the slide mechanism were completed. Continued monitoring was performed throughout the final months of the mine life. Mitigation recommendations and implementation allowed continued mining, while monitoring activities recognized impending failure and provided safe warning for mine workers.

**Sleeper Mine**

**Winnemucca, Nevada**

Performed emergency response investigation of an incipient pit slope failure marked by the development of tension cracks throughout the height of the highwall. A toppling failure mechanism was identified and a limit equilibrium analysis was completed to determine the risk level. An appropriate mitigation program was developed and the slide was stabilized.

**Pinto Valley Mine**

**Miami, Arizona**

Reviewed previous pit slope stability data and analyses to provide recommendations for design pit slope angles and dewatering requirements for a major expansion of an existing open pit.

**Mary Drinkwater Project**

**Tonopah, Nevada**

Performed detailed discontinuity cell mapping, coordinated rock testing program, and performed stability analyses to provide cut slope and foundation stability recommendations for proposed mine facilities.

**Hayden Hill Mine**

**Adin, California**

Mapped surface landslide features of a slope failure that was induced by waste dump loading. The slope failure involved 29 acres and had a head scarp in excess of 200 feet high. Incorporated available drill and geophysical logs to develop input parameters for the development of a reclamation plan. These parameters were used to perform back-analyses, analyze stability of regrading options, and recommend reclamation strategies. The stability analysis

incorporated a stochastic water balance model to quantify the effects on stability of revegetation and rainfall/snowmelt events.

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**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE    GEOLOGIC HAZARDS**

**Lama Project**

**Argentina**

Assessed geologic hazards for Lama Project area for environmental permitting. Hazard mapping was based on previous geomorphologic mapping, aerial photograph review, and a site investigation. A geologic hazard map was prepared at a scale of 1:10000 in Arcview format for a 48 km<sup>2</sup> area between elevations of 3,500 to 5,250 m amsl. Trenching studies were performed across potential active faults. Other mapped hazards included debris flows, debris slides, rock and soil slumps, rockfall, and outwash for facility siting and mine design considerations. Hazards were ranked high, medium, or low.

**El Indio Mine**

**Chile**

Prepared avalanche and landslide hazard maps for mine closure purposes. Avalanche runout distances and potential landslide impacts were estimated to assist in siting drainage channels alignments.

**Veladero Mine**

**Argentina**

Assessed avalanche hazards, landslide hazards, and active fault hazards for facility siting and mine design considerations.

**Master s Thesis**

**Reno, Nevada**

Produced a hazard map series depicting the distribution of earthquake-induced ground failure hazards, including liquefaction and landslides, throughout the Reno/Sparks region.

**Nevada Bureau of Mines and Geology**

Co-author for NBMG publication *Planning Scenario for a Major Earthquake in Western Nevada*. NBMG Special Publication 20, 1996.

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**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE HEAP LEACH, WASTE ROCK, AND MINE PROCESS FACILITIES**

**Erdenet Mine**

**Mongolia**

Project Manager for preliminary design of a 150 Mt copper heap leach pad and associated ponds and diversion channels and for a solution collection system for the proposed leaching of an existing dump. Site challenges included low strength and relatively high permeability foundation soils, water balance surplus, high groundwater conditions, cold winter temperatures.

**Veladero Project**

**Argentina**

Coordinated on-site investigation activities for pre-feasibility, feasibility, and detailed design phases of a proposed new gold mine. Investigation activities included geotechnical drilling, test pit excavation, geophysical profiling, installation of piezometers, subsurface thermal surveying, and geological mapping with a crew of two to four geologists. Site investigations took place during three consecutive field seasons. The site is located at an altitude between 4,000 and 4,775 m amsl and is subject to low temperatures, high winds, and a number of other site challenges that required assessment including earthquake hazards, avalanche hazards, landslide hazards, active fault potential, debris flows, and floods.

**Vueltas del Rio**

**Honduras**

Project Manager and lead engineer for the design and production of construction-level drawings for a >100,000 m<sup>2</sup> gold heap leach pad expansion, contingency pond, and diversion channel. The site is located in an area of high rainfall and saprolitic soils. The leach pad expansion design incorporated the ability to convert a contingency pond into additional leach pad area after the initial pad expansion area was covered by ore.

**Morenci Mine**

**Morenci, Arizona**

Project Manager for Golder's geotechnical support for feasibility and final design phases of a large copper heap leach facility. Components of the investigation included evaluations of geotechnical and flow parameters of various crushed ore sizes, soil borrow investigations, heap flow modeling, embankment stability, settlement estimates, grading plans, liner designs, pipe crushing analyses, and development of a monitoring program.

**Cyprus Miami Mine**

**Miami, Arizona**

Responsible for permitting and final design of several major aspects of a proposed lined copper heap leach facility that is to encompass 313 acres. Major issues include the damming of tributary drainages, retrofitting an existing dam and impoundment to perform as a process pond, and the conveyance of seepage and stormwater runoff.

**Cyprus Miami Mine**

**Miami, Arizona**

Completed designs and bid documents for BADCT upgrades to several existing stormwater retention ponds and mine process facility storm runoff containment systems.

**Robinson Project**

**Ely, Nevada**

Performed site investigation in support of a leach pad and solution pond design. Designed leach pad liner system, solution collection system, process and overflow ponds, and stormwater diversion for 12 million ton gold heap leach pad expansion. Produced complete design drawing set and design report suitable for permitting and construction.

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**Thomas J. Wythes, P.E., R.G**

**Hayden Hill Mine**

**Adin, California**

Prepared design plans and technical specifications for a major expansion to an existing heap leach pad.

**Reona Project**

**Battle Mountain, Nevada**

Involved in numerous aspects of the design and construction of the heap leach pad including solution collection, leak detection, storm diversion, and grading plans.

**Corona Gold Mine**

**Gabbs, Nevada**

Designed a liner apron and associated solution collection and leak detection systems to allow regrading of the ore heap for reclamation purposes.

**Pinto Valley Mine**

**Miami, Arizona**

Performed feasibility-level stability analyses of proposed waste rock storage facilities to be incorporated into the Plan of Operation. The analyses followed U.S. Forest Service guidelines for stability analyses of waste rock facilities on Forest Service Lands.

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**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE TAILINGS DAMS**

**Grizzly Gulch Tailings Facility**

**Lead, South Dakota**

Assisted in the development and completion of a geotechnical investigation of a tailings facility involving CPTU, drilling from floating barge, and drilling from land-based equipment. Information gathered was compiled to develop design parameters that were used to evaluate draindown behavior, water balance for evaporative water disposal system, consolidation rates, and magnitudes. A geochemical characterization study was performed concurrently by Golder. This information was used to develop closure options and help to define long-term risks associated with closure of the facility.

**Mercur Mine**

**Tooele, Utah**

Performed geotechnical investigation of tailings facility involving CPTU and drilling from floating barge and tracked equipment. Information gathered was compiled to develop design parameters that were used to evaluate draindown behavior, water balance for evaporative water disposal system, consolidation rates and magnitudes, embankment stability, liquefaction potential, and post-liquefaction stability. This information was used to develop closure options and to define long-term risks associated with closure of the tailings facility.

**Bullfrog Mine**

**Beatty, Nevada**

Prepared design plans, technical specifications, and a final report suitable for permitting and construction for a major expansion of an existing tailings facility. The design included a balanced cut and fill, a staged construction sequence, tie-in to existing piping system and solution storage facilities, a redesign of the storm diversion system, and an analysis of the liquefaction potential of the upstream constructed portion. The project was completed within 6 weeks and was approved for construction in 10 weeks without modification. A set of bid documents suitable for the solicitation of contractor bids was prepared.

**Robinson Project**

**Ely, Nevada**

Performed many of the technical analyses for a 250-foot high tailings embankment including seepage, settlement, stability, and seepage collection piping. Completed the design plan revisions and revised the technical specifications for revised dam design.

**Tintaya Mine**

**Peru**

Performed a feasibility-level redesign of an existing tailings facility to extend the life of the facility 5 to 8 years and provide stabilization measures for existing structures susceptible to failure during the design seismic event. The redesign involved switching the tailings deposition method from a thickened discharge method, which was not well suited to the site conditions, to an upstream cycloned embankment construction method.

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**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE SURFACE WATER HYDROLOGY**

**Mercur Mine**

**Tooele, Utah**

Prepared detailed design and design specifications for a site-wide stormwater diversion channel system for the reclamation and closure of the mine. The channel system design incorporated fluvial geomorphic principles, natural stream classification systems, and stream restoration practices to re-establish the natural hydrologic regimes. The design provides for channels that are self-maintaining and that will exhibit long-term stability.

**Cyprus Miami Mine**

**Miami, Arizona**

Prepared detail design and design specifications, for an approximately 2-mile long surface stormwater diversion channel and stormwater impoundment in support of a copper heap leach pad. Performed hydrologic runoff computations to determine impoundment storage requirements and to compute peak runoff for channel design. Completed stable channel design incorporating sediment transport and channel armoring aspects.

**Cyprus Miami Mine**

**Miami, Arizona**

Completed a site-wide stormwater pond evaluation. This evaluation assessed the ability of the existing ponds and pumps to contain a wet pattern storm sequence and provided recommendations for additional upgrades.

**Robinson Project**

**Ely, Nevada**

Calculated design storm runoff and bedload transport rates and incorporated these into a stable channel design of 7-mile stormwater diversion around a tailings facility. Completed detailed design layout that included a balanced cut and fill and prepared design drawings and technical specifications suitable for construction.

**Robinson Project**

**Ely, Nevada**

Performed hydrologic calculations and developed a layout and design for an approximately 3-mile long diversion channel to convey storm runoff from the mine facilities area around the town of Ruth. The design incorporated natural drainage features to the extent possible but required bedrock excavation, a highway culvert, a railroad culvert, and erosion protection measures.

**Pinto Valley Mine**

**Miami, Arizona**

Performed hydrological analyses and designed containment facilities to control storm runoff per BADCT, Aquifer Protection Permit, and National Pollutant Discharge Elimination System requirements. Provided pumping and piping requirements recommendations to restore required capacity within specified time.

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**Thomas J. Wythes, P.E., R.G**

**PROJECT RELATED EXPERIENCE MINE RECLAMATION AND CLOSURE**

**Bullfrog Mine**

**Beatty, Utah**

Completed an alternatives study to evaluate tailings underdrain solution disposal options for closure planning. Options evaluated included evaporation, water treatment, land application, infiltration, and outlet sealing. Options were evaluated in terms of cost, potential environmental liability, duration, visual impacts, and regulatory acceptance.

**Mercur Mine**

**Tooele, Utah**

Prepared design drawings and bid documents for mine site reclamation. Aided in acquisition of agency approvals, Notice of Intent revision, and annual state reporting. Reclamation activities included regrading; topsoiling; and revegetation of waste rock facilities, heap leach facilities, mill, and ancillary facilities and tailings embankment slopes. Re-established site-wide stormwater drainage system and historical road access routes. Project involved approximately 4 million cubic yards of earthworks. The entire project from initial scoping to bidding through completion of regrading and revegetation was completed within 10 months.

**Ray Complex**

**Hayden, Arizona**

Analyzed the post-closure stability of three tailings disposal facilities for inclusion in reclamation plan. Carried out a review of relevant prior geotechnical investigations and applied the information generated in those studies to an evaluation of the stability of the tailings embankments for post-closure conditions. Performed transient, finite element seepage modeling to predict long-term draindown condition. Generated analytical cross-sections of the proposed ultimate embankments to analyze the embankment stability and conducted sensitivity analyses for variable and uncertain parameters.

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Dr. Conrad E. Huss, P.E., Ph.D.  
M3 Engineering & Technology Corporation  
2440 W. Ruthrauff Rd., Suite 170  
Tucson, Arizona USA 85705  
Phone: 520-293-1488 / Fax 520-293-8349  
Email: [chuss@m3eng.com](mailto:chuss@m3eng.com)

**CERTIFICATE of AUTHOR**

I, Dr. Conrad E. Huss, P.E., Ph.D., do hereby certify that:

1. I am Executive Vice President and Chairman of the Board of:

M3 Engineering & Technology Corporation  
2440 W. Ruthrauff Rd., Suite 170  
Tucson, Arizona USA 85705

2. I graduated with a degree in Bachelor s of Science in Mathematics and a Bachelor s of Art in English from the University of Illinois in 1963. I graduated with a Master s of Science in Engineering Mechanics from the University of Arizona in 1968. In addition, I earned a Doctor of Philosophy in Engineering Mechanics from the University of Arizona in 1970.
  3. I am a Professional Engineer in good standing in the State of Arizona in the areas of Civil and in Structural engineering. I am also registered as a professional engineering in the States of California, Maine, Minnesota, Missouri, Montana, New Mexico, Oklahoma, Oregon, Texas, Utah and Wyoming.
  4. I have worked as an engineer for a total of thirty-seven years since my graduation from the University of Illinois. I have taught at the University level part-time for 5 years and as an assistant professor for one year.
  5. I have read the definition of qualified person set out in National Instrument 43-101 ( NI 43-101 ) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
  6. I am responsible for the preparation of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006. . I visited the Peñasquito property on two separate occasions: September 24-25, 2003 and February 19-20, 2005.
  7. I have had prior involvement with the property that is the subject of Technical Report. The nature of my prior involvement is preparation of a Pre-Feasibility Study dated March 2004.
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8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
10. I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with that instrument.
- 11<sup>1</sup>. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 25 Day of July 2006.

Signature of Qualified Person

Conrad E. Huss, PE

Print name of Qualified Person

---

**Conrad E. Huss, PE, PhD**

M3 Engineering & Technology Corp.

2440 W. Ruthrauff Rd., Suite 170

Tucson, AZ 85705 USA

Phone: 520-293-1488 / Fax 520-293-8349

**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.

British Columbia Securities Commission

Alberta Securities Commission

Saskatchewan Securities Commission

Manitoba Securities Commission

Ontario Securities Commission

Autorité des marchés financiers du Québec

Nova Scotia Securities Commission

New Brunswick Office of the Administrator of Securities

PEI Provincial Affairs & Attorney General

Department of Government Services and Lands, Government of Newfoundland and Labrador

The Toronto Stock Exchange

I, Conrad Huss, do hereby consent to the filing by Glamis Gold Ltd. (the Company ) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 31, 2006 (the Technical Report ) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 25 day of July, 2006.

/s/ Conrad E. Huss

Signature of Qualified Person

Conrad E. Huss, PE

Name of Qualified Person

---

**CONRAD E. HUSS, P.E.**  
**Engineering Manager**

**EDUCATION** Ph.D., Engineering Mechanics, University of Arizona  
M.S., Engineering Mechanics, University of Arizona  
B.A., English, University of Illinois  
B.S., Mathematics, University of Illinois

**REGISTRATION** Civil and Structural Engineer Arizona  
Professional Engineer California, Idaho, Maine, Minnesota, Montana, New Mexico,  
Oklahoma, Oregon, Texas, Utah, Washington, Wyoming

**EXPERIENCE** Forty (40) years of design in industrial, municipal, commercial projects, including material handling, reclamation, water treatment, base metal and precious metal process plants, industrial minerals, smelters, chemical plants, special structures and audits. Career highlights include twenty-five years of design/construct experience, plant startups in South America and Mexico, oceanography/surveying in Alaska and Hawaii, and six years of university teaching.

**PROJECT EXPERIENCE**

M3 Engineering & Technology, Project and Engineering Manager (19 Years)

Global Alumina Republic of Guinea 43-101 Study  
Pan American, Alamo Dorado 43-101 Study Mexico  
Pan American Manantial Espejo Silver/Gold Argentina  
Phelps Dodge Bagdad Primary Crusher Relocation Arizona  
Refugio Reopening Chile  
Climax Molybdenum Moly Metal Plant Arizona  
Phelps Dodge Safford CASC Design Arizona  
Phelps Dodge Safford Copper Leach Arizona  
CEMEX Victorville Clinker Hall California  
Western Silver Peñasquito Scoping, 43-101 Study and Feasibility Studies Zacatecas, Mexico  
Piedras Verdes Copper Leach 43-101 Study Mexico  
AVESTOR Lithium Vanadium Polymer Battery Plant with Laboratories Nevada  
Kennecott Utah Lime Plant Feasibility Study Utah  
Phelps Dodge Arizona Closure/Closeout Plans at 7 properties Arizona  
Alamos Gold Mulatos Prefeasibility Mexico  
Teck Cominco Glamis Gold Feasibility Mexico  
Kennecott Rawhide conceptual Closeout Plan for Leach Pile Nevada  
Phelps Dodge El Abra Structural and Material Handling Audit Chile  
Kennecott Utah Bid Call for Restructure of Maintenance Workforce Utah  
Phelps Dodge El Abra SX-EW ER Tank Replacement Chile  
Fischer-Watt Copper SX-EW Prefeasibility Mexico  
Kerr McGee 1200 MTPY BLVO Plant Apex, Nevada

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**CONRAD E. HUSS, P.E.**

**Engineering Manager**

M3 Engineering & Technology, (continued)

Billiton/BHP Worsley Alumina Plant Audit Australia  
 Phelps Dodge Tyrone Closure/Closeout Plans with Water Treatment Plant New Mexico  
 Mitsubishi Cement Lucerne Valley Plant Upgrades California  
 Chino Closure/Closeout Plans with Water Treatment Plant New Mexico  
 Mitsubishi Cement Longbeach Ocean Port California  
 Cobre Closure/Closeout Plans New Mexico  
 Phelps Dodge El Abra, Chile, Material Handling and Structural Audit  
 Billiton/ALCOA Alumar Alumina Refinery Plant in Brazil, Material Handling/Structural Audit  
 Peñoles F.I. Madero 8,000 TMPD Greensfield Silver/Lead/Zinc Mexico  
 Kennecott Greens Creek Flotation Expansion, Silver/Lead/Zinc Alaska  
 Phelps Dodge Henderson, Colorado, Material Handling and Structural Audit  
 Kennecott Greens Creek Pyrite Circuit for Reclamation Alaska  
 Phelps Dodge Morenci Coronado Leach Arizona  
 Cyprus Cerro Verde Crush/Convey Peru  
 California Portland Cement RIMOD 3 Expansion Arizona  
 Phelps Dodge Candelaria Material Handling and Structural Audit Chile  
 Minera Alumbrera Startup and Performance Test for Copper/Gold Plant Argentina  
 Echo Bay Gold Aquarius Feasibility Study Canada  
 Arizona Portland Cement Expansion Arizona  
 Minera Alumbrera, SAG Mill Run In 3 month field assignment Argentina  
 Phelps Dodge Ajo, Open Air Copper Mill Arizona  
 Echo Bay Paredones Gold Amarillos EPCM Basic Engineering Mexico  
 Cyprus Sierrita Inpit Crush/Convey Arizona  
 Kennecott Smelter Upgrade following Audit Utah  
 Battle Mountain Crown Jewel, Gold and Silver Detail Engineering Washington  
 Kennecott Greens Creek Reopening and Reclamation, Lead/Zinc/Silver Alaska  
 Cyprus Bagdad Material Handling and Structural Audit Arizona  
 Hecla Rosebud Precious Metal Detail Engineering and Reclamation Nevada  
 Phelps Dodge Morenci Ball Mills A-7 and B-32, Copper Concentrator  
 Phelps Dodge Hidalgo Smelter Upgrade Simulation  
 Kerr-McGee West Chicago Physical Separation Reclamation Facility with Water Treatment  
 Lluvia Del Oro Gold Plant Detail Engineering Mexico  
 Cyprus Miami Smelter Modifications for Ancillaries Arizona  
 Phelps Dodge Chino Smelter Upgrade including Uptake Shaft Arizona  
 Cyprus Miami Smelter Casting Furnace Upgrade Arizona  
 Phelps Dodge Morenci Material Handling and Structural Audit Arizona  
 Geomaque Gold Detail Engineering Sonora, Mexico  
 Phelps Dodge Morenci Smelter Equipment Relocation Arizona  
 Phelps Dodge Hidalgo Smelter Fugitive Gas Collection System Arizona

**CONRAD E. HUSS, P.E.**

**Engineering Manager**

M3 Engineering & Technology, (continued)

Magma San Manuel Smelter Anode Press Plant Arizona  
 Phelps Dodge Ajo Smelter Demolition Arizona  
 Penmont La Herradura Gold Plant Mexico  
 Phelps Dodge Hidalgo Smelter Upgrade including Reaction Shaft New Mexico  
 Cyprus Casa Grande Roaster Upgrades, Copper Arizona  
 Zinc Corp Roaster Upgrade Oklahoma  
 Cyprus Bagdad WaterFlush Crusher, Copper Arizona  
 ASARCO Hayden Smelter Dust System Arizona  
 Placer Dome Mulatos Gold Plant Basic Engineering Mexico  
 Cyprus Bagdad 156,000 TPD Feasibility Study Arizona  
 Cyprus Bagdad Feasibility Study for Inpit Crushing and Mill Expansion Arizona  
 Hecla La Choya Gold Plant, Sonora, Mexico  
 Chemstar Lime Plants, Western United States  
 Majdanpek, Yugoslavia, Crush/Convey for Copper Mine  
 Phelps Dodge Chino SX-EW Expansion New Mexico  
 Magma McCabe Gold Plant Expansion Arizona  
 Phelps Dodge Morenci Flotation Expansion, Copper Arizona  
 Phelps Dodge Chino Waterflush Crusher, Copper New Mexico  
 Granite Sand & Gravel Plant Arizona  
 Kerr-McGee Manganese Dioxide Chemical Plant Nevada  
 Cyprus Sierrita Acid Plant (Rhenium Recovery) Arizona  
 Phelps Dodge Chino Conveyor System Rebuild New Mexico  
 Molycorp Mountain Pass Crush/Convey System for Rare Earths California  
 Cyprus Esperanza/Twin Buttes Cross Country Conveyor Upgrade Arizona  
 Mt. Graham Utilities and Tankage Arizona  
 Old Tucson Utility Inventory and Upgrade Arizona  
 ASDM Utility Inventory and Upgrade Arizona  
 Cyprus Twin Buttes Fuel Stations Demolition and Upgrade Arizona  
 Cyprus Sierrita Fuel Station Demolition and Upgrade Arizona  
 Cyprus Sierrita ADM Chemical Plant Arizona  
 ASARCO Mission Mill Feed Upgrade, Copper Arizona  
 Cyprus Miami Road and Bridge Arizona  
 ASARCO Mission Dust Collection, 96,000 CFM Arizona  
 Magma San Manuel No. 4 Head Frame Upgrade Arizona  
 Cyprus Sierrita Ferro Moly Dust Collection Arizona  
 St. Cloud Flotation Upgrade, Lead/Zinc/Silver New Mexico  
 University of Arizona Optical Mirror Laboratory Arizona  
 Mt. Graham SMT Telescope Facility Arizona  
 Mt. Graham Observatory Site Programming, Utilities and Maintenance Building Arizona

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**CONRAD E. HUSS, P.E.**

**Engineering Manager**

M3 Engineering & Technology, (continued)

Phelps Dodge Chino Inpit Crush/Convey Study New Mexico  
Philippines Crush/Convey Study  
Cyprus Bagdad Tankhouse Expansion, Copper  
Phelps Dodge Morenci Inpit Crush/Convey Checking Arizona  
Cyprus Sierrita Inpit Crush/Convey Arizona  
AZANG Maintenance Hangar and Hush House Arizona  
Cyprus Sierrita Column Cell Expansion I & II, Copper/Moly Arizona  
Cyprus Sierrita Moly Roaster Feed Systems I & II Arizona  
Magma Pinto Valley #4 Tailing Dam Slurry Pump Station Arizona  
Ft. Huachuca General Instruction Building Arizona  
Mt. Bell Communication Centers Arizona  
Cyprus Sierrita Moly Packaging System Upgrade Arizona

RGA Engineering Corporation. Structural Engineer, V. President, Engineering Director (4 Years)

Coronado Post Office for USPS Arizona  
Amphitheater Elementary School and University of Arizona Science Building Arizona  
Tanque Verde and Campbell Avenue Street Lighting Arizona  
Reid Park Band Shell and Master Plan Arizona  
AZANG Engine Shop, General Purpose Shop, Hush House Arizona  
Northern Arizona University Information Center Arizona  
Davis-Monthan Combat Support Center Arizona  
Ft. Huachuca Communications Facilities Arizona  
University of Texas Submillimeter Telescope Texas  
Arizona-Sonora Desert Museum Mountain Habitat Arizona  
Ina Road Bridge, Tanque Verde Bridge, Clifton Bridge, I-17 AC/DC Bridge, Orange Grove Bridge  
University of Arizona Submillimeter Telescope Arizona  
University Heights Shopping and Parking Complex Arizona  
La Paloma Resort Hotel and Office Complex Arizona  
Design of warehouses and greenhouses Worldwide  
Design of banks, apartments, office buildings Arizona  
Design of elephant enclosure Arizona  
Design of conveyor head frames and maintenance shops Arizona  
Design of schools, libraries, churches Arizona  
Project Engineer for conversion of U.S.P.S. power system in Phoenix, Az with 2-350 ton chillers  
Analysis for parking garage and pedestrian bridge Arizona  
Finite element earthquake analysis of ten-story office building Arizona  
Design of eight-story reinforced concrete hotel Mexico  
Converter Blower Electrification, Project Manager, Inspiration, Arizona

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**CONRAD E. HUSS, P.E.**

**Engineering Manager**

Mountain States Engineers, Vice President and Manager of Engineering (4 Years)

52,000-65,000 TPD Mill Expansion, SPCC Cuajone, Peru  
Pennsylvania Fuels Group, Coal Gasification Plant Study  
Gold Mill Expansion, Newmont, Carlin Nevada  
Shuichang Bethlehem International Crush/Convey, 10,000 TPH China  
Gold Heap Leach Study, Newmont, Telfer Australia  
Fly Ash Disposal System, Tucson Electric Springerville, Arizona  
Concentrate Loadout, Cyprus Bagdad Arizona  
Tailings System, Cyprus Bagdad Arizona  
No. 19 Dump Leach System, Inspiration Arizona  
8000 TPH Crushing/Conveying of Waste, Kennecott Copper Corp. Arizona  
150,000 TPD Crush/Convey, Kennecott Ray, Arizona  
50,000 TPD Crushing/Conveying System, Island Copper BC, Canada  
10,000 TPD Limestone Loadout, Grupo Cementos Mexico  
40,000-54,000 TPD Mill Expansion, Cyprus Bagdad Arizona  
Smelter Coal Conversion, Phelps Dodge Hidalgo, New Mexico  
Modification of 3000 TPH Wash Plant, Carbon Coal New Mexico  
Moly By-Product Plant, Phelps Dodge Ajo, Arizona  
50 TPD Zinc Skimmings Plant, National Zinc Oklahoma  
4000 TPH Portable Crusher, Duval Corp. Sierrita, Arizona  
Sulfur Unloading Facility, Duval Corp. Galveston, Texas

Mountain States Engineers, Piping Department Head (1 Year)

Gulf & Western Sonora Gold California  
1000 TPD Moly By-Product Plant, ASARCO, Mission Arizona  
40,000 TPY Flotation Retrofit, ASARCO, Mission Arizona  
Tailings System, Plateau Resources Utah  
2600 TPH Crush/Convey, Climax Molybdenum Co. Colorado  
2000 TPD Moly By-Product Plant, La Caridad Mexico  
6600 TPH Crushing/Conveying Majdanpek, Yugoslavia  
Coal Loadout Facility, CF&I, Maxwell Mine Colorado  
12,000 TPD Uranium/Vanadium Plant, Cotter Corp. Colorado  
Lined Tailings Pond, Cotter Corp. Colorado  
Spent Catalyst Plant, Cotter Corp. Colorado  
750 TPD Uranium Mill, Plateau Resources Utah  
Potash Plant Modifications, Duval Corp. Carlsbad, New Mexico  
Feasibility Study for Urangesellschaft, Site Determination and Environmental  
Delamar Silver Plant CCD-Idaho

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**CONRAD E. HUSS, P.E.**

**Engineering Manager**

Mountain States Engineers, Structural Engineer and Department Head (5 Years)

Round Mountain, Nevada, Heap Leach Gold including recovery pad

Lime Plant, Nafinsa, Job Engineer Santa Rita, Arizona

250,000 TPD Crushing/Conveying, Job Engineer, Duval Corporation Sierrita, Arizona

Ferro-Moly Plant, Job Engineer, Duval Corp. Sierrita, Arizona

Special Investigations of Towers, Thickener and Frames

Hughes Aircraft Company, Structural Engineer (½ Year)

Finite element analysis of missiles and vibration isolation of missile components

Strain gauge layout and destructive testing

Teaching (6 Years)

Adjunct Lecturer, University of Arizona (2 Years)

Assistant Professor of Engineering, Northern Arizona University (1 Year)

Graduate Fellow in Engineering Mechanics, University of Arizona (4 Years)

High School Teacher, West Tampa Junior High School ½ Year)

LTJG U.S. Coast and Geodetic Survey (3 Years)

3rd in Command, USC & GSS Hydrographer

Hydrographical surveys in Hawaii, Alaska and Florida

Inspection of damage caused by Alaskan Good Friday Earthquake

Photogrammetry and land surveying in Alaska

**COURSES**

Cold Regions Engineering Short Course

Completed MSHA Training

**PUBLICATIONS**

HUSS, Conrad, and Dan Neff; Horizontally Stiffened Angular Hoppers Analyzed by Beam Action Versus Finite Element .Bulk Solids Handling, June 1984.

HUSS, Conrad, and Nikita G. Reisler; A Comparison of Handling Systems for Overburden of Coal Seams .Bulk Solids Handling, March 1984.

HUSS, Conrad, and Dan Neff; Horizontally Stiffened Membrane Hoppers Analyzed by Virtual Work Versus Finite Element .Bulk Solids Handling, November 1983.

HUSS, Conrad, Nikita G. Reisler, and R. Mead Almond; Practical and Economic Aspects of In-Pit Crushing Conveyor Systems .SME/ AIME, October 1983.

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**CONRAD E. HUSS, P.E.**

**Engineering Manager**

**PUBLICATIONS Continued**

HUSS, Conrad, and Dan Neff; Finite Element Structural Analysis of Movable Crusher Supports , Bulk Solids Handling, March 1983.

HUSS, Conrad; Cost Considerations for In-Pit Crushing/Conveying Systems , Bulk Solids Handling, December 1982.

ALMOND, R. Mead, and Conrad Huss; Open-Pit Crushing and Conveying Systems , Engineering and Mining Journal, June 1982.

MUNSELL, Stephen, R. Mead Almond, and Conrad Huss; The Trend Toward Belt Conveying of Ore and Waste in Arizona Open Pit Mines , SME/AIME, September 1978.

SANAN, Bal, and Conrad Huss; Foundation Design for Rod and Ball Mills , ACI Conference 1977, Presentation Only.

HUSS, Conrad, and Ralph Richard; Dynamic Earthquake Analysis of Tucson Federal Office Building , GSA Contract 70-6-02-0058, May 1972.

HUSS, Conrad; Axisymmetric Shells Under Arbitrary Loading , The University of Arizona, 1970. Doctoral Thesis.

HUSS, Conrad; Airy's Function by a Modified Trefftz's Procedure The University of Arizona, 1968. Master's Thesis.

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**Golder Associates Inc.**

4730 N. Oracle Road, Suite 210

Tucson, AZ 85705

phone: (520) 888-8818 fax: (520) 888-8817

mpegnam@golder.com

**CERTIFICATE OF QUALIFIED PERSON**

**Michael L. Pegnam**

1. I, Michael L. Pegnam, P.E., am a Professional Engineer and Senior Engineer of Golder Associates Inc. of Tucson, Arizona.
  2. I am a member of the Society for Mining, Metallurgy and Exploration Inc. and a member of the American Society of Civil Engineers.
  3. I graduated from the University of Arizona in 1992 with a Bachelor of Science degree in Geological Engineering and from the University of California, Berkeley in 1994 with a Master of Science degree in Geotechnical Engineering. I have practised my profession continuously since 1994.
  4. I am a Professional Engineer in good standing in the State of Arizona in the area of Civil Engineering. I am also registered as a professional engineer in the states of California and New Mexico.
  5. As a result of my experience and qualifications I am a Qualified Person as defined in National Instrument 43-101.
  6. I am presently a Senior Engineer for Golder Associates Inc.
  7. I am responsible for the geotechnical foundation recommendations for the report titled Peñasquito Feasibility Study Geotechnical Characterization Report, Heap Leach Facility, Waste Rock Piles, Tailings Impoundment, and Plant Site Foundation Recommendations dated September 22, 2005. This report is included as an appendix to the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27, 2006 (the Technical Report ) relating to the Peñasquito Project. I understand that changes have been made to these facilities since the September 22, 2005 report was published and I will have the opportunity to review and revise the geotechnical recommendations based on the new locations of the facilities as (they become available. I have not visited the Peñasquito property.
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8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I am not aware of any material factor material change with respect to the subject matter which is not reflected in this report omission to disclose which would make this report misleading.
10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
11. I have read National Instrument 43-101, Form 43-101F1 and this report has been prepared in compliance with NI 43-101 a 43-101F1.

Signed at Tucson, Arizona this 27 day of July 2006.

/s/ Michael L. Pegnam

Michael L. Pegnam, P.E.  
Senior Engineer  
QUALIFIED PERSON

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**Michael L. Pegnam**  
Golder Associates Inc.  
4730 N. Oracle Road, Suite 210  
Tucson, AZ 85705 USA  
Phone: 520-888-8818 / Fax 520-888-8817

**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.  
British Columbia Securities Commission  
Alberta Securities Commission  
Saskatchewan Securities Commission  
Manitoba Securities Commission  
Ontario Securities Commission  
Autorité des marchés financiers du Québec  
Nova Scotia Securities Commission  
New Brunswick Office of the Administrator of Securities  
PEI Provincial Affairs & Attorney General  
Department of Government Services and Lands, Government of Newfoundland and Labrador  
The Toronto Stock Exchange

I, Michael L. Pegnam, do hereby consent to the filing by Glamis Gold Ltd. (the Company) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27, 2006 (the Technical Report) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the written disclosure in the news release of the Company dated June 21, 2006 relating to the subject matter of the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 27 day of July 2006.

/s/ Michael L. Pegnam

Signature of Qualified Person

Michael L. Pegnam

Name of Qualified Person

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**Michael L. Pegnam, P.E.**

**Education:** M.S., Geotechnical Engineering, University of California, Berkeley, 1994 B.S., Geological Engineering, University of Arizona, Tucson, 1992 Short Course, Geotechnical Foundation Engineering Rock Slopes, National Highway Institute, December 2000

**Registrations/  
Affiliations:** Professional Engineer in Arizona, California, and New Mexico  
American Society of Civil Engineers  
U.C. Berkeley Geotechnical Society

**Experience:**

2004 to Present	<b>Golder Associates</b> <i>Senior Geotechnical Engineer</i> Responsible for the geotechnical and geologic design of civil surface transportation projects and heap leach facilities and waste containment systems for the mining industry. Specialty expertise in civil projects includes geotechnical retaining wall design, including soil nail walls and mechanically stabilized earth walls, rigid and flexible pavement design, and bridge foundations. Specialty expertise in mining applications includes rock and soil slope stability evaluation. Foundation design experience for a wide variety of facilities and includes drilled shafts, micropiles, and shallow spread footings. Responsibilities also include providing technical oversight and review	<b>Tucson, Arizona</b>
1999 to 2004	<b>URS Corporation</b> <i>Geotechnical Team Leader</i> Project Manager and Geotechnical Engineer with the Surface Transportation Group of URS in Arizona. Responsible for the direction of design projects and field investigations for a wide variety of foundation engineering projects involving design of shallow and deep foundations in both soil and rock. These projects have included multi-disciplinary urban transportation projects, including highways and bridges, foundation engineering for light and heavy industrial development, including processing plants and power plant substations, and pavement design for applications ranging from major freeways to private parking facilities. Responsibilities also included management of junior geotechnical engineering personnel.	<b>Tucson, Arizona</b>
1997 to 1999	<b>Call &amp; Nicholas, Inc.</b> <i>Project Engineer</i> Responsible for rock mass characterization, analysis of rock strength and structure data, as design of optimum pit slope angles for a variety of open pit mining operations. Responsibilities also included slope stability analysis and design of mine waste containment facilities.	<b>Tucson, Arizona</b>
1994 to 1997	<b>WESTEC, Inc.</b> <i>Staff Engineer</i> Performed field investigations, and assisted in the design of heap leach facilities, tailings impoundments, and the geotechnical analysis of mine facility foundations.	<b>Reno, Nevada</b>

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**Michael L. Pegnam, P.E.**

**PROJECT RELATED EXPERIENCE SURFACE TRANSPORTATION**

**US 70 Hondo Valley Design/Build Project**

**Ruidoso, New Mexico**

Provide geotechnical engineering services for this design-build project involving reconstruction and widening of US 70 to a 4-lane facility between Ruidoso Downs and Riverside. Detailed geotechnical design of approximately 30 soldier-pile lagging walls, and six mechanically stabilized earth walls was provided. Additional services included interpretation of subsurface soil geotechnical properties along the alignment based on borehole data, preparation of comprehensive geotechnical design reports, and coordination with team structural engineers and construction inspectors during retaining wall construction.

**Pima County DOT Skyline Drive Design, Build Project**

**Tucson, Arizona**

Provided geotechnical services on this project involving the reconstruction of Skyline Drive from Chula Vista Road to east of Campbell Avenue. Major geotechnical design issues included pavement design, technical review of mechanically stabilized earth wall design submittals, and plans and specification and construction inspection and testing for a soil nail wall.

**On-call Geotechnical Engineering Services,  
New Mexico State Highway and Transportation  
Department**

**Arizona**

Served as Project Geotechnical Engineer for Statewide On-call Geotechnical Services for the New Mexico State Highway and Transportation Department. The project started in April 1999 and was completed in March 2003. Tasks completed with a brief description are as follows:

1. US 70, Ruidoso: Evaluate rock cuts and provide design recommendations, Revise the NMSHTD standard specs for rock excavation.
2. Raton Pass: Provide independent technical reviews for geotechnical work performed by others. There are several active landslides and rock cuts along the highway through Raton Pass.
3. US 84/285, Tesuque Traffic Interchange: Provide complete geotechnical analysis and design for Bohanon Huston, Inc.
4. US 84/285: Pojoaque and Cuyamungue Traffic Interchanges: Provide complete geotechnical analysis and design for Louis Berger.
5. I-40 / Louisiana Traffic Interchange in Albuquerque: Provide final geotechnical analysis and design for Parsons Brinckerhoff.
6. NM 434 Mora to Black Lake: Provide complete geotechnical services include subsurface investigations, analysis and design for a 25-mile-long highway for Holmes and Narver.

**I-10 / I-19 Traffic Interchange**

**Tucson, Arizona**

Served as a Project Geotechnical Engineer For the reconstruction of the largest freeway (I-10) to freeway (I-19) traffic interchange in southern Arizona. The project included 10 bridges and 10 retaining walls. Responsible for the field and laboratory investigation of soils and providing geotechnical recommendations for drilled shaft foundations, cut and fill slopes, retaining walls, and pavements. Mr. Pegnam was also an integral part of a drilled shaft load test program that resulted in significant cost savings for the client. The load test was performed on an 8-foot diameter, 135-foot deep shaft and the ultimate failure load imposed on the shaft, at an equivalent top-down load of 34,000 kips, established a

world record in drilled shaft load testing.

**On-call Subsurface Investigations**  
**Arizona Department of Transportation**

**Arizona**

Project Geotechnical Engineer responsible for providing as-needed geotechnical services to ADOT. Services include field and laboratory investigations analysis and design, preparation of reports, peer review, and field

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**Michael L. Pegnam, P.E.**

construction services. In addition, may be requested to supplement ADOT's geotechnical staff on a short-term basis. Several of these tasks are briefly described as follows:

1. I-17, MP 292 ±, Rock fall study; Provide recommendations for mitigation of rockfall hazard. The evaluation was twofold: including drainage and geotechnical issues.
2. ADOT Nogales Maintenance Facility, Foundation Repair: The foundation slab for the facility has experienced large settlements and cracked. Assignment includes investigation of the cause of distress and recommendations for foundation repair.
3. SR 89A Oak Creek Canyon Switchbacks, Mitigation of Roadway Distress: The outside lane of SR 89A has experienced settlement and possibly sliding down the side of a steep rock slope. Assignment includes investigation of the cause of distress and recommendations for repair.
4. SR 82 Bridge over Santa Cruz River, Nogales: Provide complete geotechnical services for a five span bridge widening.
5. SR 87 Whiskey Springs Bridge: Evaluated the cause of distress of the MSE wall at the abutment, and evaluated several mitigation procedures in coordination with ADOT.

**On-call Geotechnical Engineering**

**Arizona**

**Pima County Department of Transportation**

Project Geotechnical Engineer/Project Manger responsible for providing as-needed geotechnical services to PCDOT. Services include field and laboratory investigations analysis and design, preparation of reports, peer review, and field construction services. Some of the completed tasks are briefly described as follows:

1. Soil Nail Wall River Road Improvements: Provide geotechnical construction inspection and training and review of value-engineered designs.
2. Soil Nail and Tied-back Wall Designs Sunrise Drive: Provide guidance on design of cut walls, technical specifications, and review of MSE wall submittals. Provide inspectors during cut wall construction.
3. MSE wall design review Phoenix Avenue, Summerhaven: Provide technical review of a geotechnical design report, design calculations, and preliminary project drawings associated with an MSE wall.

**Interchange 10 Traffic Interchange Twin**

**Marana, Arizona**

**Peaks/Linda Vista**

Lead Project Geotechnical Engineer for this two-phase project to add a new interchange on Interstate 10 between Cortaro Road and Avra Valley Road. Geotechnical issues included foundations for a new bridge over the Santa Cruz River, grade separation structures at Interstate 10 and the Union Pacific Railroad, pavement design, and retaining wall design. The first phase of the project included preparation of a Design Concept Report. The second phase of the project included final design documents.

**I-10 Mainline Widening Cortaro Road to Ina Road**

**Marana, Arizona**

Performed geotechnical investigation and provided foundation recommendations for the widening of the I-10 Mainline. Bridge foundation recommendations were provided for the widening of the I-10 bridges over Ina Road and pavement structural sections for the new widened lanes and rehabilitation alternatives for the existing mainline lanes were developed.

**Duval Mine Road I-49 T.I.**

**Sahuarita, Arizona**

Provided complete geotechnical services associated with the reconfiguration and reconstruction of (the traffic interchange at the intersection of Interstate 19 with Duval Mine Road. Services included: a thorough geotechnical subsurface investigation, recommendations for shallow and deep foundation systems for the new bridge, evaluation of the collapse potential of soils beneath new embankments, pavement design report and materials memorandum for new frontage roads, and evaluation of soils for drainage structures.

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**Michael L. Pegnam, P.E.**

**SR 77 (Oracle Road): River Road to Ina Road, Tucson, Arizona**

Provided geotechnical design report, detailed design drawings, and complete special provisions for a 14,000 ft<sup>2</sup> soil nail wall. The wall is part of the addition of multi-purpose lanes along Oracle Road, and is designed to provide for the 20-foot clear zone adjacent to a soil bluff near River Road.

**B-10 Quartzsite Roadway Reconstruction Arizona**

Provided full geotechnical services for the widening of a 10-span bridge and a 5-span bridge. Additional tasks included roadway subgrade investigation, retaining wall foundation recommendations, bridge foundation data sheets, and scour studies.

**Silvercroft Wash Pedestrian Bridge, Pima County Arizona  
DOT&FCD,**

Provided geotechnical foundation design report for this pedestrian bridge spanning the Silvercroft Wash at its confluence with the Santa Cruz River. Design recommendations were provided for drilled shaft foundations and shallow spread footings, abutment and retaining walls, and cut and fill slopes.

**US 93 Burro Creek Section - Mohave County, Arizona**

Provided complete geotechnical evaluation for the foundations of a new steel truss arch bridge spanning Burro Creek Canyon. Rock mass characterization, rock strength determination, and rock structural stability analyses were performed to determine allowable bearing capacity, and stability of the bridge abutments, pier and two large concrete skewbacks.

**US 93 Cottonwood Canyon Bridle Creek Section, Mohave County, Arizona**

Lead Geotechnical Engineer for the design of this 3.5-mile segment of US 93. Geotechnical design elements included drilled shaft foundations in Tertiary bedrock for two bridges over Cottonwood Creek, design of a 60-foot-high reinforced soil slope, cut slope design in rock cuts up to 180 feet high, and development of materials and earthwork factor recommendations.

**I-10 Mainline Interim Widening Marana Rd to Cortaro Rd, Marana, Arizona**

Lead geotechnical engineer for this interim widening of I-10. Services included geotechnical investigation and drilled shaft foundation recommendations for six bridges to be widened, preparation of Bridge Foundation Report, Pavement Design Summary, Materials Pavement Design Report. Rehabilitation alternatives for the existing mainline lanes were also developed.

**Michael L. Pegnam, P.E.**

**PROJECT RELATED EXPERIENCE GEOTECHNICAL FIELD INVESTIGATIONS**

**P-483, Station Ordinance Area, Phase I U.S. Marine Corps Air Station**

**Yuma**

Complete geotechnical field investigation and geotechnical design recommendations for shallow spread footings, slabs-on-grade, post-tensioned slabs, retaining walls, rigid and flexible pavement, site grading and earthwork.

**SlimFast Foods Company**

**Tucson, Arizona**

Mr. Pegnam was responsible for providing complete geotechnical services including field and laboratory investigations, foundation recommendations and preparing geotechnical reports. Foundation types included spread footings and drilled piers in collapsible soils.

**Tucson Electric Power Gateway Substation**

**Tucson, Arizona**

Responsible for providing complete geotechnical services including field and laboratory investigations, foundation recommendations, and preparing the geotechnical report. The project requirements included providing recommendations for grading and erosion control for the site, which required cuts and fills up to 48 feet deep, and foundation recommendations for both spread footings and drilled piers.

**Midtown Library Project**

**Tucson, Arizona**

Directed field investigation and preparation of geotechnical design recommendations for a new library in Tucson, Arizona. Recommendations included design of shallow spread footings for masonry walls, floor slabs, post tensioned slabs-on-grade, flexible pavement structural sections for the parking lot, and site grading and earthwork. Special project issues included design for mitigation of potentially hydro-collapsible soil.

**Kirk-Bear Canyon Library Expansion**

**Tucson, Arizona**

Provided geotechnical field investigation and geotechnical design recommendations for a 4,500 square foot addition to an existing library. Recommendations included design of shallow spread masonry wall footings, floor slabs, post tensioned slabs-on-grade, and site grading and earthwork.

**Electrical Consultants, Inc.**

**Arizona**

Directed a field investigation to provide recommendations for the foundations for large transmission towers proposed to connect two electrical substation switchyards west of Phoenix. Performed geotechnical analysis for drilled pier foundations, including consideration of the large overturning moments imposed by the tower

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**Michael L. Pegnam, P.E.**

**PROJECT RELATED EXPERIENCE    PIT SLOPE DESIGN**

**Minera Alumbreira, Ltd.**

**Argentina**

Performed bench-scale, inter-ramp scale, and overall pit wall scale slope stability analysis associated with optimizing pit slope angles for Phase II of the Bajo de la Alumbreira Mine. Project included development of a rock mass geotechnical model from RQD and rock hardness logging from various drilling campaigns and laboratory rock strength testing.

**Compania Minera Mantos De Oro**

**Chile**

Project engineer on this study to provide recommended slope angles for the Coipa Norte Pit and for the Farellon North Extension. Overall pit wall scale slope stability was evaluated using limiting-equilibrium methods with anisotropic strengths to define the critical noncircular shear surfaces.

**Calaveras Cement Company**

**Redding, California**

Performed oriented core drilling program, and rock structure mapping campaign, and assisted in pit slope stability analysis to provide recommendations for pit slope angles for this limestone quarry in northern California.

**Hanson Permanente Quarry**

**California**

Evaluated failure of the west wall of this limestone quarry and provided recommendations for mitigation. Failure mechanism was determined to be mass sliding along a fault contact between limestone and underlying serpentinitic greenstone. Mitigation included excavation at crest and installation of horizontal drains to relieve pore pressure on the failure plane.

**Luzenac America Talc Quarry**

**Ennis, Montana**

Performed geologic mapping, rock structure mapping, and oriented core drilling to evaluate the stability of a talc processing facility at the crest of a pit wall failure. Stability evaluation also considered potential liquefaction of subsurface saturated ash deposit that extended below the limits of the facility.

**Freeport McMoran**

**Irian Jaya, Indonesia**

Performed rock structure mapping in support of pit slope design of the west wall of the Grasberg Pit. Evaluation of rock strength from laboratory testing and oriented core drilling program was also provided.

**Diavik Diamond Mines, Inc.**

**Northwest Territory, Canada**

Trained local Diavik Diamond Mines personnel in oriented coring, and assisted in core logging for preliminary pit slope evaluation during the feasibility phase of mine development. Pit slope stability analysis was performed for the granite pit wall rock through evaluation of oriented core data to map out potential major failure planes involving a combination of pervasive joints and intact rock.

**Michael L. Pegnam, P.E.**

**PROJECT RELATED EXPERIENCE    HEAP LEACH**

**Ruby Hill Project**

**Eureka, Nevada**

Project involved design of two Phases of this 11 million ton heap leach facility. Project work included complete geotechnical investigation, preparation of final engineering drawings, construction specifications, and report suitable for permitting and construction of the heap leach facilities. Sizing and design of associated solution and event ponds were also included.

**Trenton Canyon Project**

**Valmy, Nevada**

Project engineer for the siting, geotechnical investigation, and design of heap leach facility. Project work also included extensive borrow source investigation for construction materials.

**Mule Canyon Project**

**Valmy, Nevada**

Project engineer for the preliminary siting and feasibility design of heap leach facility.

**Mesquite Mine**

**Brawley, California**

Performed preliminary sizing, and piping design for feasibility study of the expansion of an existing heap leach facility.

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**Michael L. Pegnam, P.E.**

**PROJECT RELATED EXPERIENCE DAMS/EARTHWORK**

**Section 4 Tailings Impoundment Elkhorn Mine**

**Jefferson County, Montana**

Project engineer for the development of four alternative conceptual embankment designs, development of comparative cost estimate for construction and closure, and preparation of a summary report of the findings.

**Calaveras Cement Company**

**Redding, California**

Responsible for the design of a 6-million ton low-grade limestone stockpile within steep, forest terrain. Project work included geologic mapping, drilling, test pit excavation, and laboratory testing.

**Ayam Hitam Ore Stockpile**

**Irian Jaya, Indonesia**

Conducted evaluation of stability and settlement of a large ore stockpile founded upon peat filled sediments. Design issues included estimating how close the stockpile toe could approach existing facilities without causing damaging differential settlement.

**Centralia Mining Company**

**Centralia, Washington**

Conducted cone penetrometer investigation of a mine waste filled pit, and assisted in design of earthen cap for the mine waste. Design included utilizing geogrid support over the extremely soft and saturated waste deposits to develop a working platform for earth moving equipment.

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**Michael L. Pegnam, P.E.**

**PUBLICATIONS**

Samtani, N.C. and M. L. Pegnam, 2001. Pullout *Resistance of Cut/Splayed Grid Reinforcement in MSE Walls*. The 10<sup>th</sup> International Conference on Computer Methods and Advances in Geomechanics, Tucson, AZ. January 2001.

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**Golder Associates Inc.**

44 Union Boulevard, Suite 300

Denver, CO 80228

phone: (303) 980-0540 fax: (303) 985-2080

jmjohnson@golder.com

**CERTIFICATE OF QUALIFIED PERSON**

**James M. Johnson**

1. I, James M. Johnson, P.E., am a Professional Engineer and Principal and Project Director of Golder Associates Inc. of Denver, Colorado.
  2. I am a member of the Society for Mining, Metallurgy and Exploration Inc., a member a member of the American Society of Civil Engineers, a member of the United States Society on Dams, and a member of the Association of State Dam Safety Officials.
  3. I graduated from Cornell University in 1976 with a Bachelor of Science degree in Civil Engineering and from Purdue University in 1979 with a Master of Science degree in Civil Engineering (Geotechnical). I have practised my profession continuously since 1979.
  4. Since 1979 I have held positions in the following engineering consulting firms, working primarily on analysis, design, permitting and construction of tailings, heap leach, mine waste storage and water storage facilities:
    - (a) From 1979 to 1983 as a staff level geotechnical engineer based in Vancouver, British Columbia, Canada, working for Klohn Leonoff Ltd.;
    - (b) From 1983 to 1986 as a project level engineer based in Denver, Colorado USA, working for Fox Consultants Inc. (1983 -1985) and Canonie Engineers (1985-1986);
    - (c) From 1986 to 1994 as a senior engineer based in Denver, Colorado USA, working for Steffen Robertson and Kirsten (US) Inc. (1986 -1991) and Woodward-Clyde Consultants (1991-1994);
    - (d) From 1994 to present as an Associate, then Principal and Project Director, for Golder Associates Inc. in Denver, Colorado.
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5. I am a Professional Engineer in good standing in the State of Arizona in the area of Civil Engineering. I am also registered as a professional engineer in eleven other states including my primary registration in Colorado.
  6. As a result of my experience and qualifications I am a Qualified Person as defined in National Instrument 43-101.
  7. I am presently a Principal and Project Director for Golder Associates Inc.
  8. I am responsible for the Tailings Storage Facility design for the Peñasquito Project as documented in the June 2006 Golder report titled Tailings Storage Facility Conceptual Design Report, Peñasquito Project, Zacatecas State, Mexico (Project No. 063- 2100.2010). This report, prepared by personnel of Golder Associates Inc under my direct supervision, is included as an appendix to the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27,2006 (the Technical Report ) relating to the Peñasquito Project. I understand that changes have been made to mine plan since the June, 2006 report was published which will impact the size, location and operation of the tailings facilities, and that I will have the opportunity to review and revise the design based on an updated mine plan when it becomes available. I have not visited the Peñasquito property.
  9. Civil and geotechnical calculations for the Tailings Storage Facility design were prepared under my direct supervision by a team of engineers and support personnel. The evaluation of tailings geochemistry was the responsibility of the following technical specialist:
    - (a) Mr. Matt Wickham, a senior project manager and Associate at Golder Associates in Lakewood, Colorado with more than 20 years experience in hydrogeology and geochemistry in addition to M.Sc. and B.Sc. degrees in Hydrology and Hydrogeology from the University of Arizona.
  10. I have had no prior involvement with the property that is the subject of the Technical Report.
  11. I am not aware of any material fact or material change with respect to the subject matter which is not reflected in this report, the omission to disclose which would make this report misleading.
  12. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
  13. I have read National Instrument 43-101, Form 43-101F1 and this report has been prepared in compliance with NI 43-101 and Form 43-101F1.
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Signed at Lakewood, Colorado this 27<sup>th</sup> day of July 2006.

/s/ James M. Johnson

James M. Johnson, P.E,  
Principal and Project Director  
QUALIFIED PERSON

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**James M. Johnson**  
Golder Associates Inc.  
44 Union Boulevard, Suite 300  
Denver, CO 80228 USA  
Phone: 303-980-0540 / Fax 303-985-2080

**CONSENT of AUTHOR**

TO: Glamis Gold Ltd.  
British Columbia Securities Commission  
Alberta Securities Commission  
Saskatchewan Securities Commission  
Manitoba Securities Commission  
Ontario Securities Commission  
Autorite des marches financiers du Quebec  
Nova Scotia Securities Commission  
New Brunswick Office of the Administrator of Securities  
PEI Provincial Affairs & Attorney General  
Department of Government Services and Lands, Government of Newfoundland and Labrador  
The Toronto Stock Exchange

I, James M. Johnson, do hereby consent to the filing by Glamis Gold Ltd. (the Company ) of the technical report titled Peñasquito Feasibility Study 100,000 MTPD dated July 27, 2006 (the Technical Report ) prepared for the Company by M3 Engineering & Technology Corp. with the above securities regulatory authorities.

I also certify that I have read the written disclosure in the news release of the Company dated June 21, 2006 relating to the subject matter of the Technical Report and I do not have any reason to believe that there are any misrepresentations in the information derived from the Technical Report or that the written disclosure contains any misrepresentation of the information contained in the Technical Report.

Dated as of the 27<sup>th</sup> day of July 2006.

/s/ James M. Johnson

Signature of Qualified Person

James M. Johnson

Name of Qualified Person

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**James M. Johnson, P.E.**

**Education:** B.S. (with distinction) Civil Engineering, Cornell University, 1976  
M.S. Civil Engineering (Geotechnical), Purdue University, 1979  
Economic Evaluation and Investment Decision Methods Colorado School of Mines  
Engineering and Environmental Aspects of Mine Waste Disposal SME  
Improvement of Soils Course University of Wisconsin  
Copper Heap Leach Design SME  
Planning and Design Concepts for Mine/Mill Closure SME  
PM-24, Project Management Training Golder U

**Affiliations:** Registered Professional Engineer in Colorado, Oregon, Idaho, Utah, Wyoming, Montana, New Mexico, South Dakota, Maine, Arizona, Nevada and Michigan Society for Mining, Metallurgy, and Exploration, Inc.  
American Society of Civil Engineers  
United States Society on Dams  
Association of State Dam Safety Officials

**Experience:**

<b>1994 to Present</b>	<b>Golder Associates</b> <i>Principal and Project Director, Geotechnical Engineering</i> Project director/project manager for civil and mining design and construction projects, and environmental remediation projects. Typical projects include: design and construction of storage facilities for slurried, thickened, paste and filtered tailings, heap leach pads and ponds, water storage reservoirs and ancillary facilities; preparation of environmental permitting documents; closure studies for mine facilities; feasibility studies for repair of water storage reservoirs; and remediation studies for mining sites.	<b>Denver, Colorado</b>
<b>1991 to 1994</b>	<b>Woodward-Clyde Consultants</b> <i>Consulting Engineer</i> Project manager of civil and mining design, construction, and remediation projects primarily in the western United States. Task manager and primary author of project alternatives chapters and plan of operation documents for NEPA permitting documents for mining operations. Typical projects included design and construction of tailings impoundments, feasibility studies for repairs to water storage reservoirs, technical review and oversight of MDA technical memoranda for the U.S. Bureau of Reclamation's SEED program to evaluate the condition and safety of existing dams, preparation of environmental permitting documents to meet NEPA and state requirements and preparation of RI/FS and EE/CA documents for mining superfund sites.	<b>Denver, Colorado</b>
<b>1986 to 1991</b>	<b>Steffen Robertson and Kirsten (U.S.), Inc.</b> <i>Division Head-Geotechnics</i> Responsible for all aspects of geotechnical design and coordination of multidisciplinary teams on mining, waste disposal, and water resources projects. Typical projects included design, permitting, and construction of heap leach pads and ponds, tailings impoundments, ash disposal impoundments, and water storage reservoirs. Specialty work included grouting, slurry walls, tunnel liners, lined, and unlined impoundments, and seepage interception systems.	<b>Denver, Colorado</b>

**James M. Johnson, P.E.**

- 1985 to 1986**      **Canonie Engineers**      **Denver, Colorado**  
*Project Geotechnical Engineer*  
Responsible for all aspects of geotechnical design and management of construction monitoring crews for waste disposal and water storage facilities. Projects included design of structures for storage/disposal of industrial, municipal, and mine wastes and structures for water storage/transmission. Also responsible for development of plan of operation and health and safety documents for remediation of hazardous waste sites and evaluation of existing waste disposal facilities.
- 1983 to 1985**      **Fox Consultants, Inc.**      **Denver, Colorado**  
*Project Geotechnical Engineer*  
Responsible for project planning, field, and laboratory investigations, design analyses, and report preparation. Typical projects included design and construction supervision for tailings dams, evaluation of industrial waste disposal facilities, safety evaluations for existing dams, preparation of analysis reports for the U.S. Bureau of Reclamation's SEED program, and foundation design for electrical transmission line towers.
- 1979 to 1983**      **Klohn Leonoff Ltd.**      **Richmond, British  
Columbia, Canada**  
*Staff Geotechnical Engineer*  
Responsible for field and laboratory geotechnical investigations, management of construction monitoring crews, design analyses and report preparation on a variety of projects including tailings dams, heap leach pads and ponds, water storage dams, and industrial foundations.
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**James M. Johnson, P.E.**

**PROJECT RELATED EXPERIENCE MINING**

**Moab Uranium Tailings Pile Relocation Project**

**Moab, Utah**

Project Manager responsible for materials handling conceptual design for removal and relocation of 16 million tons of uranium mill tailings from an inactive tailings impoundment located adjacent to the Colorado River. Subsequent work included value engineering for the Phase 1 design; geotechnical characterization of tailings pile using drilling and sampling methods, CPT and backhoe test pits; on-site bench-scale testing; and review of offsite laboratory testing. Ongoing work includes development of a geotechnical model for the tailings impoundment and development of a staged excavation plan.

**Peñasquito Project**

**Zacatecas State, Mexico**

Project Manager for design of tailings impoundment for 258 million tonnes of tailings derived from ores containing silver, gold, zinc and lead. Tailings production rate is 50,000 tpd. Preferred concept is earthfill/rockfill starter dam followed by a centerline raise, cycloned sand dam. Work included geotechnical and geochemical tailings characterization, selection of a preferred tailings management concept, design layout, mass balance and water balance.

**Choco Gold Mine**

**Bolivar State, Venezuela**

Project Manager overseeing the engineering analyses, site selection, alternative studies, engineering designs, engineering cost estimates, and report preparation for a 80 million tonne gold tailings disposal facility. Alternatives included full range of tailings management options including dilute slurry, thickened slurry and paste tailings, and multiple disposal sites. Work included geotechnical and rheological tailings characterization, selection of a preferred tailings management concept, design layout, mass balance and water balance.

**Conga Project**

**Cajamarca Department, Peru**

Task Manager for accretion modeling, settlement analysis and preliminary stability evaluation for a 140 m high, valley-fill, thickened mill sands stack for 556 million tonnes of copper mill sands. Preparatory work included review and interpretation of geotechnical characterization data for various mill sands, flume deposition testing, critical state soil mechanics testing, case history data, and engineering literature on performance of hydraulic fills.

**Molycorp Mountain Pass Mine**

**Mountain Pass, California**

Project Director responsible for engineering design team and field engineering and construction quality assurance team for installation of two evaporation ponds equipped with multi-layered liner and leak detection systems.

**Molycorp Mountain Pass Mine**

**Mountain Pass, California**

Project Director responsible for field engineering and construction quality assurance team for closure of a 9 million ton rare earth tailings disposal facility. Work included site regrading, placement of evapotranspiration (ET) cover of local alluvial soils, construction of surface water management features and installation of instrumentation for performance monitoring.

**U.S. Borax**

**Boron, California**

Project Director and Task Manager for prefeasibility evaluation of tailings management options including boric acid precipitates and gangue materials from mineral processing. Work includes evaluation of existing waste management operations, development of mass balance for waste materials, sampling and testing of waste materials, and evaluation of alternative management strategies.

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**James M. Johnson, P.E.**

**Minera Yanacocha SRL**

**Cajamarca, Peru**

Task Manager overseeing the engineering analyses, site selection, alternative studies, prefeasibility and basic engineering designs, engineering cost estimates, and report preparation for a 50 million tonne gold tailings disposal facility. Alternatives included: full range of tailings management options including dilute slurry, thickened slurry, paste, filtered and cement-stabilized tailings; multiple disposal sites including open pits, existing heap and waste rock disposal facilities, and several dedicated tailings disposal sites. Selected alternative includes deposition of thickened tailings at an existing heap leach facility, using part of the heap and liner system as containment.

**Molycorp Questa Mine**

**Questa, New Mexico**

Project Manager overseeing engineering studies to evaluate potential use of dilute slurry, thickened slurry, paste or filter cake tailings to backfill ground surface subsidence above ongoing block-caving mining operation.

**Molycorp Mountain Pass Mine**

**Mountain Pass, California**

Project Manager overseeing the engineering analyses, alternative cover studies, borrow investigations, conceptual and detailed engineering designs, engineering cost estimates, report preparation and permitting for closure of a 9 million ton rare earth tailings disposal facility. Evapotranspiration (ET) cover of local alluvial soils was selected based on demonstration as equivalent to the standard low permeability cover as per California regulations. Design includes facility regrading including extra fill to compensate for predicted tailings settlement, cover placement and installation of surface water diversions.

**Phelps Dodge Morenci Inc.**

**Morenci, Arizona**

Third party review of proposed 1-West Buttress repair methods and decant system decommissioning.

**Molycorp Questa Mine**

**Questa, New Mexico**

Technical Reviewer for engineering evaluations and permitting assistance related to existing molybdenum tailings storage facilities.

**Mina Morro Do Ouro**

**Paracatu, Brazil**

Independent technical review of siting, design, and performance of lined storage ponds for CIL concentrate tailings at this 54,000 tpd gold mine.

**Los Pelambres Copper Project**

**Region IV, Chile**

Member of senior technical review team during basic engineering design of the Mauro Tailings Disposal Systems. Facilities included tailings delivery pipelines, zoned earthfill/rockfill starter dam, cycloned sand main dam, water reclaim facilities and surface water management facilities. Tailings impoundment designed to manage tailings delivery at 175,000 tpd, with storage for 1.6 billion tones of copper tailings behind a 230 m high dam.

**Cuiaba Mine**

**Nova Lima, Brazil**

Project manager for alternatives evaluation and conceptual design of surface storage facilities for 8 million tonnes of gold flotation tailings using paste and/or filtered tailings methods.

**Molycorp Mountain Pass Mine**

**Mountain Pass, California**

Project Manager overseeing the engineering analyses, site selection, alternative studies, prefeasibility and feasibility designs, engineering cost estimates, and report preparation for a 20 million ton rare earth tailings disposal facility. Technical aspects include dewatering the tailings to the consistency of paste then depositing the paste in a rotational



pattern of thin lifts to create a partially saturated mass that will stand at outslopes of 3H:1 V without confining earthen embankments.

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**James M. Johnson, P.E.**

**Luzenac Vermont Properties**

**Vermont**

Technical review of evaluations of mine waste facilities, including waste rock dump at inactive mine in Troy, Vermont and reclaimed tailings facility in Johnson, Vermont. Also responsible for technical oversight of active facility evaluations including waste rock dump and pond at Ludlow Mine and tailings at West Windsor Mine.

**El Sauzal Project**

**Mexico**

Project manager for feasibility level design for 23 million tonne gold tailings impoundment, mill foundations, and pit slopes.

**Sossego Project**

**Brazil**

Mining geotechnics oversight and technical review on feasibility level design for 225 million tonne copper tailings impoundment, waste rock dumps; and mine water management facilities.

**Lone Tree Mine**

**Nevada**

Technical oversight and review on facility performance, seepage collection design and evaluation of alternate dam construction methods

**Cresson Mine**

**Victor, Colorado**

Project director for heap leach pad expansion-designs and associated construction monitoring activities. The work included remediation of historic underground openings for a highway realignment and pad expansions, and design of heap leach pad, solution collection, and in-heap solution storage facilities for a total of 260 million tons of gold ore. Project also included design and construction of external solution control pond, ADR plant foundations and construction monitoring for highway and bridge components and for soil nail walls at the crusher facility.

**Concorcio Minero Horizonte**

**Peru**

Project director for design of 1.5 million tonne tailings impoundment at operating gold mine. Technical issues include steep terrain, landslide hazards, mudslide hazards, and high seismicity.

**La Camorra Mine**

**Venezuela**

Project director for evaluation, upgrade, and expansion to existing gold tailings impoundment and associated surface water management facilities

**Pipeline Mine**

**Beowawe, Nevada**

Independent technical review of performance of Cell 1 of the Pipeline Tailings Impoundment. Work included review of design and construction documents, visual evaluation of dam and appurtenant facilities and review of instrumentation data.

**Mosaic Carlsbad Potash Mine**

**Carlsbad, New Mexico**

Project director for design and permitting of potash tailings disposal facility expansion. Facilities include salt stack, clay settling pond, brine pipeline and brine storage ponds.

**Mississippi Potash East Plant**

**Carlsbad, New Mexico**

Project director for site selection and conceptual design of 75 million ton potash tailings disposal facility.

**Cerro Casale Project**

**Region III, Chile**

Project manager for site selection and pre-feasibility level design for 1 billion ton gold/copper tailings impoundment. Site is located in an area of high aridity and high seismicity in north central Chile.



**James M. Johnson, P.E.**

**Soledad Mountain Project**

**Mojave, California**

Project manager for design of 50 million ton gold heap leach pad with in-heap solution storage.

**Collahuasi Copper Project**

**Region I, Chile**

Project manager for site selection study and feasibility level design for disposal of approximately one billion tons of copper tailings. Site is located in an area of high aridity, high seismicity, and frequent volcanic activity in northern Chile. The design included allowances for separate delivery and disposal of pyrite in the event of pyrite removal from the tailings stream. All facilities were designed to withstand an earthquake producing peak ground accelerations at the site of 0.31g.

Subsequently acted as senior reviewer on interim engineering studies completed to evaluate possible design refinements and on final design for expanded, 1.8 billion ton tailings impoundment.

**Quebrada Blanca Copper Project**

**Region I, Chile**

Project manager for evaluation of surface water management alternatives and dump reconfiguration around pit expansion for proposed dump leach facility.

**Phoenix Gold Project**

**Battle Mountain, Nevada**

Project manager for feasibility and final designs for disposal of 50 million tons of gold tailings in north-central Nevada. The design includes a geomembrane liner with seepage collection drains to limit the potential for seepage into an existing copper tailings impoundment underlying part of the site. Subsequently, Technical Reviewer for facility redesign to store 170 million tons of tailings.

**Gold Quarry Expansion Project**

**Carlin, Nevada**

Project manager for pre-feasibility and permitting level designs for excavation and relocation of gold tailings from an existing 50 million ton tailings impoundment to make way for a proposed pit expansion. Also completed feasibility and final designs for a proposed waste rock dump to be constructed over part of the existing tailings impoundment.

**Black Cloud Lead-Zinc Mine**

**Lake County, Colorado**

Project manager for evaluation of existing condition and raise requirements for 80-foot high earth and rockfill tailing embankment. Field work included geotechnical drilling and sampling of earthfill, rockfill, and tailings materials; bulk sampling of rockfill materials; piezometer installation; and construction monitoring. Design included application of filter criteria to control piping, evaluation of liquefaction potential for the embankment and tailing materials, evaluation of embankment and raise stability, and hydrologic/hydraulic analyses for runoff diversion and storm inflow storage.

**Central Colorado Mining Superfund Site**

**Colorado**

Task manager responsible for development of tailing and mine waste remedial investigation reports. Geotechnical and geochemical data for the tailing and mine waste were evaluated to characterize twelve tailing sites and eleven mine waste piles. The sites were also evaluated for stability and potential impacts to human health. Also responsible for development of EE/CA work plan to address mine waste piles in residential areas.

**Zortman-Landusky Mine Expansion**

**Phillips County, Montana**

Task manager for project alternatives chapter of EIS for Zortman Mining Inc.'s proposed expansion of existing open-pit gold mining operations. The proposed expansion includes enlarging and combining the existing open pits to develop approximately 80 to 100 million tons of ore and 60 to 80 million tons of waste rock. The ore would be transported by conveyor and truck to existing and new heap leach pads for beneficiation and processing. Ongoing geochemical characterization of the waste rock materials is proposed to allow management of wastes with potential to

produce acid rock drainage (ARD).

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**James M. Johnson, P.E.**

**Lamefoot Project**

**Ferry County, Washington**

Task manager responsible for revised POO and project alternatives chapter of Supplemental EIS for Echo Bay Minerals proposed 1,500 ton per day underground gold mine. The proposed project includes underground mining of one million to four million tons of ore and waste rock by long hole open stoping techniques and backfilling of the workings using cemented and uncemented backfill. Backfill materials include development waste and blast rock from a nearby quarry. Ongoing geochemical characterization of wall rock, development waste and quarried backfill is proposed to allow management of materials with potential to produce acid rock drainage (ARD).

**Chino Copper Mine**

**Grant County, New Mexico**

Project manager responsible for study of strategies as part of closure plans to minimize impact to surface water and groundwater from existing dump leach and mine waste disposal facilities. Also project manager for dump leach expansion studies

**Coeur Rochester Silver Mine**

**Pershing County, Nevada**

Project manager for valley-fill leach pad for 33.5 million tons of silver heap leach ore at a maximum height of 200 feet. Liner design consisted of soil and HDPE liners separated by a granular leak detection layer. Solution storage is in-heap, with retrieval from large-diameter wells located within the heap ore.

**San Luis Gold Mine**

**Costilla County, Colorado**

Engineering manager responsible for design and assisting with state permitting for a 13 million ton tailing impoundment and associated surface water control facilities. Also responsible for design of waste rock dumps, sediment control facilities, and pit wall seepage control measures.

**Carbonate Hill Gold Project**

**Teller County, Colorado**

Engineering manager responsible for site selection, design, and waste characterization studies for proposed 3 to 5 million ton milling and heap leach operations. Assisted with state permitting. Supervised design and construction monitoring for test heap operation.

**McCoy Gold Mine**

**Battle Mountain, Nevada**

Completed initial site selection study for 30 million ton tailings disposal facility.