Reserves & Resources

Review of Ore Reserves and Mineral Resources

In line with best industry practice, Petropavlovsk reports its Mineral Resources and Ore Reserves in accordance with the JORC Code. The Mineral Resource and Ore Reserve estimates are an update on independent estimates prepared by Wardell Armstrong International (WAI), a UK based independent technical consultancy firm, in April 2017. The updated estimates incorporate all material exploration completed in 2017, 2018 and 2019 as well as depletion due to mining activities. To reflect recent market trends, the Company has increased its long-term gold price assumption for Mineral Resource reporting from US\$1,500/ oz to US\$1,700/oz. Similarly, the long-term gold

price assumption for Ore Reserve reporting was changed from US\$1,200/oz to US\$1,400/oz.

As at 31 December 2019, total Group Mineral Resources (including Reserves) amounted to 21.03Moz of gold compared to 20.52Moz twelve months previously, with total Reserves amounting to 8.46Moz compared to 8.22Moz in the previous year. The increase in Mineral Resources is due to a combination of exploration success at Pioneer and Malomir and a higher gold price assumption. In particular, the higher price assumption has enabled tailings stored at Pioneer and Pokrovskiy to be included as JORC Inferred Resources given their potential to be re-processed.

There was an overall decrease in Ore Reserves at Pioneer due to mining depletion and the use of more conservative recovery and cost assumptions with respect to estimating refractory gold ores. This was more than offset by an increase in Ore Reserves at Malomir and Albyn. The increase at Malomir resulted from an updated pit design and the inclusion of new discoveries with open pit mining potential at the Quartzitovoye area. An increase in Ore Reserves at Albyn resulted from successful in-fill drilling which converted Inferred resources into Ore Reserves at the Elginskoye deposit.

The tables below provide a summary and an asset-by-asset breakdown of Group Mineral Resources and Ore Reserves.

An independently audited estimate is expected to be published during Q3 2020.

Group Ore Reserves as at 31/12/2019 (in accordance with the JORC Code 2012 (1))

Total Open Pit and Underground Ore Reserves

Total Open I Rana Onaci gi cana Oic necesi ve	•			
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	55,300	0.78	1.38
	Probable	223,316	0.99	7.08
	Proved+Probable	278,616	0.94	8.46
Non-Refractory	Proved	22,158	0.69	0.49
	Probable	57,964	1.06	1.98
	Proved+Probable	80,122	0.96	2.47
Refractory	Proved	33,141	0.84	0.89
_	Probable	165,352	0.96	5.10
	Proved+Probable	198,494	0.94	5.99
Total Open Pit Ore Reserves				
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	55,103	0.75	1.34
_	Probable	221,952	0.95	6.81
_	Proved+Probable	277 055	0.91	8 14

Total	Proved	55,103	0.75	1.34
	Probable	221,952	0.95	6.81
	Proved+Probable	277,055	0.91	8.14
Non-Refractory	Proved	21,961	0.63	0.45
	Probable	57,094	1.00	1.84
	Proved+Probable	79,055	0.90	2.28
Refractory	Proved	33,141	0.84	0.89
	Probable	164,858	0.94	4.97
	Proved+Probable	197,999	0.92	5.86

Total Underground Ore Reserves

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	197	7.56	0.05
	Probable	1,364	6.25	0.27
	Proved+Probable	1,561	6.42	0.32
Non-Refractory	Proved	197	7.56	0.05
	Probable	870	5.08	0.14
	Proved+Probable	1,067	5.54	0.19
Refractory	Proved	_	-	_
	Probable	494	8.32	0.13
	Proved+Probable	494	8.32	0.13

Group Mineral Resources as at 31/12/2019 (in accordance with the JORC Code 2012 (1))

Total Open Pit and Underground Mineral Resources

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	75,490	0.87	2.11
	Indicated	464,138	0.86	12.76
	Measured+Indicated	539,628	0.86	14.87
	Inferred	293,575	0.65	6.16
Non-Refractory	Measured	37,690	0.93	1.13
	Indicated	143,853	0.95	4.38
	Measured+Indicated	181,544	0.94	5.51
	Inferred	134,738	0.58	2.53
Refractory	Measured	37,800	0.81	0.98
	Indicated	320,285	0.81	8.38
	Measured+Indicated	358,084	0.81	9.37
	Inferred	158,837	0.71	3.63

Total Open Pit Mineral Resources

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	73,979	0.80	1.90
	Indicated	457,788	0.82	12.05
	Measured+Indicated	531,767	0.82	13.95
	Inferred	285,832	0.60	5.54
Non-Refractory	Measured	36,179	0.79	0.92
	Indicated	138,685	0.87	3.86
	Measured+Indicated	174,864	0.85	4.78
	Inferred	127,593	0.48	1.97
Refractory	Measured	37,800	0.81	0.98
	Indicated	319,103	0.80	8.18
	Measured+Indicated	356,903	0.80	9.17
	Inferred	158,240	0.70	3.57

Total Underground Mineral Resources

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	1,511	4.33	0.21
	Indicated	6,350	3.50	0.71
	Measured+Indicated	7,861	3.66	0.93
	Inferred	7,743	2.47	0.62
Non-Refractory	Measured	1,511	4.33	0.21
	Indicated	5,168	3.10	0.51
	Measured+Indicated	6,680	3.38	0.72
	Inferred	7,146	2.43	0.56
Refractory	Measured	_	_	_
	Indicated	1,181	5.27	0.20
	Measured+Indicated	1,181	5.27	0.20
	Inferred	598	2.98	0.06

Summary of Ore Reserves by Asset as at 31/12/2019 (in accordance with the JORC Code 2012 ⁽¹⁾)

Malomir Open Pit and Underground Ore Reserves

watering open Fit and officer ground ore neserv	69			
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	18,830	0.76	0.46
	Probable	83,226	0.97	2.58
	Proved+Probable	102,057	0.93	3.04
Non-Refractory	Proved	12	1.71	0.001
	Probable	647	1.98	0.04
	Proved+Probable	659	1.97	0.04
Refractory	Proved	18,819	0.76	0.46
	Probable	82,579	0.96	2.54
	Proved+Probable	101,398	0.92	3.00
Malomir Open Pit Ore Reserves				
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	18,828	0.76	0.46
	Probable	92 A11	0.06	2.56

Maiorini Operii it Ore Headil ved				
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	18,828	0.76	0.46
	Probable	83,011	0.96	2.56
	Proved+Probable	101,838	0.92	3.02
Non-Refractory	Proved	9	1.00	0.0003
	Probable	432	1.33	0.02
	Proved+Probable	440	1.32	0.02
Refractory	Proved	18,819	0.76	0.46
	Probable	82,579	0.96	2.54
	Proved+Probable	101,398	0.92	3.00

Malomir Underground Ore Reserves

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	3	3.93	0.0004
	Probable	216	3.27	0.02
	Proved+Probable	218	3.28	0.02
Non-Refractory	Proved	3	3.93	0.0004
	Probable	216	3.27	0.02
	Proved+Probable	218	3.28	0.02
Refractory	Proved	_	_	_
	Probable	_	_	_
	Proved+Probable	_	_	_

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	12,927	0.74	0.31
	Probable	65,537	1.04	2.19
	Proved+Probable	78,465	0.99	2.50
Non-Refractory	Proved	9,704	0.62	0.19
	Probable	43,864	0.99	1.40
	Proved+Probable	53,568	0.92	1.59
Refractory	Proved	3,223	1.11	0.11
	Probable	21,673	1.15	0.80
	Proved+Probable	24,896	1.14	0.91
Pioneer Open Pit and Underground Ore Reserves	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	21,514	0.75	0.52
	Probable Probable	72,358	0.95	2.20
	Proved+Probable	93.871	0.90	2.72
Non-Refractory	Proved	10,414	0.61	0.20
	Probable	11,258	1.22	0.44
	Proved+Probable	21,672	0.92	0.64
Refractory	Proved	11,100	0.88	0.31
	Probable	61,100	0.90	1.76
	Proved+Probable	72,199	0.89	2.07
Diamana Dia O Danaman				
Pioneer Open Pit Ore Reserves	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
 Total	Proved	21,320	0.68	0.47
	Probable Probable	71,209	0.85	1.95
	Proved+Probable	92,529	0.81	2.42
Non-Refractory	Proved	10,220	0.47	0.16
	Probable Probable	10,604	0.94	0.10
	Proved+Probable	20,824	0.71	0.48
Refractory	Proved	11,100	0.88	0.40
	Probable	60,606	0.84	1.63
	1 TODADIO	00,000	0.01	1.00

Pioneer Underground Ore Reserves

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	194	7.61	0.05
	Probable	1,148	6.81	0.25
	Proved+Probable	1,343	6.93	0.30
Non-Refractory	Proved	194	7.61	0.05
	Probable	654	5.68	0.12
	Proved+Probable	848	6.12	0.17
Refractory	Proved	_	-	_
	Probable	494	8.32	0.13
	Proved+Probable	494	8.32	0.13

Tokur Ore Reserves (all open pit)

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Proved	2,028	1.47	0.10
	Probable	2,195	1.44	0.10
	Proved+Probable	4,223	1.45	0.20
Non-Refractory	Proved	2,028	1.47	0.10
	Probable	2,195	1.44	0.10
	Proved+Probable	4,223	1.45	0.20
Refractory	Proved	_	_	_
	Probable	_	_	_
	Proved+Probable	_	_	_

- (1) With an exception of Tokur, Group Ore Reserves statements are prepared internally as an update of the April 2017 WAI estimate. The Pioneer, Malomir and Albyn Reserves were prepared in April 2020 in accordance with JORC Code 2012; Tokur Reserves were prepared in 2010 by WAI in accordance with JORC Code 2004 and there have been no changes to the Tokur estimates since that date.
- (2) Pioneer, Malomir and Albyn Ore Reserves for open pit extraction are estimated within economical pit shells using a US\$1,400/oz gold price assumption and applying other modifying factors based on the projected performance of these operating mines. Tokur Reserves have been based on a US\$1,000/oz gold price assumption, together with operating costs assumptions relevant at the time of the estimate
- (3) The Open Pit Reserves cut-off grade for reporting varies from 0.30 to 0.70g/t Au, depending on the asset and processing method
- (4) Underground Ore Reserves estimates use a mine design with decline access, trackless mining equipment and a sublevel open stope mining method with or without back fill
- (5) Reserve figures have been adjusted for anticipated dilution and mine recovery
- (6) The Underground Reserves cut-off grade for reporting is 1.5g/t Au
- (7) In accordance with JORC Code, all open pit and underground designs have been based on Measured and Indicated Resources; in addition to the Proved and Probable Reserves quoted above, the design captures the following Inferred Resource:
- Pioneer: 61,006kt@0.30g/t (0.59Moz) of non-refractory and 7,647kt @ 0.67g/t (0.16Moz) of refractory;
- Malomir: 166kt @ 0.77g/t (0.004Moz) of non-refractory and 6,453kt@0.89g/t (0.18Moz) of refractory
- Albyn 4,296@1.01g/t (0.2Moz) of non-refractory and 55.7kt@ 1.25g/t (0.02Moz) of refractory
- (8) Figures may not add up due to rounding

Summary of Mineral Resources by Asset as at 31/12/2019 (in accordance with JORC Code 2012 $^{(2)}\!)$

Malomir Open Pit and Underground Mineral Resources

Maioriii Open Fit and Onderground Millera Nesot	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	19,016	0.77	0.47
	Indicated	134,250	0.87	3.77
	Measured+Indicated	153,267	0.86	4.24
	Inferred	113,941	0.71	2.60
Non-Refractory	Measured	18	0.90	0.001
·	Indicated	1,919	1.85	0.11
	Measured+Indicated	1,937	1.84	0.11
	Inferred	1,251	1.50	0.06
Refractory	Measured	18,999	0.77	0.47
	Indicated	132,331	0.86	3.66
	Measured+Indicated	151,330	0.85	4.13
	Inferred	112,690	0.70	2.54
Malomir Open Pit Mineral Resources				
Maiorini Operii Riviniera riesouroes	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	16,047	0.31	0.16
	Indicated	125,841	0.87	3.54
	Measured+Indicated	141,888	0.81	3.70
	Inferred	95,862	0.72	2.22
Non-Refractory	Measured	8	0.78	0.0002
	Indicated	14,196	0.69	0.32
	Measured+Indicated	14,204	0.69	0.32
	Inferred	7,603	0.73	0.18
Refractory	Measured	16,039	0.31	0.16
	Indicated	111,645	0.90	3.22
	Measured+Indicated	127,684	0.82	3.38
	Inferred	88,259	0.72	2.04
Malomir Underground Mineral Resources				
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	330	3.86	0.04
	Indicated	466	3.54	0.05
	Measured+Indicated	796	3.67	0.09
	Inferred	513	2.61	0.04
Non-Refractory	Measured	330	3.86	0.04
	Indicated	466	3.54	0.05
	Measured+Indicated	796	3.67	0.09
	Inferred	513	2.61	0.04
Refractory	Measured	_	_	_
	Indicated	_	_	_
	Measured+Indicated	_	_	_

Inferred

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	13,395	0.75	0.32
	Indicated	108,271	1.04	3.61
	Measured+Indicated	121,666	1.00	3.93
	Inferred	25,344	1.33	1.08
Non-Refractory	Measured	9,887	0.63	0.20
	Indicated	67,470	1.01	2.18
	Measured+Indicated	77,356	0.96	2.38
	Inferred	18,968	1.36	0.83
Refractory	Measured	3,508	1.08	0.12
	Indicated	40,801	1.09	1.43
	Measured+Indicated	44,309	1.09	1.55
	Inferred	6,376	1.24	0.25
Albyn Open Pit Mineral Resources				
Albyii Open Fit Milleral Nesources	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	13,384	0.75	0.32
	Indicated	105,268	1.02	3.45
	Measured+Indicated	118,651	0.99	3.77
	Inferred	18,380	1.07	0.64
Non-Refractory	Measured	9,887	0.63	0.20
	Indicated	65,472	0.98	2.06
	Measured+Indicated	75,358	0.93	2.26
	Inferred	13,342	0.99	0.43
Refractory	Measured	3,497	1.08	0.12
	Indicated	39,796	1.09	1.39
	Measured+Indicated	43,293	1.09	1.52
	Inferred	5,038	1.29	0.21
Album Lindovavo und Minovol Donouvoo				
Albyn Underground Mineral Resources	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	- I I I I I I I I I I I I I I I I I I I		-
	Indicated	1,998	2.00	0.13
	Measured+Indicated	1,998	2.00	0.13
	Inferred	5,626	2.23	0.40
Non-Refractory	Measured			
	Indicated	1,998	2.00	0.10
	Measured+Indicated	1,998	2.00	0.10
	Inferred	5,626	2.23	0.40
Refractory	Measured	-		0.40
	Indicated	_	_	
	Measured+Indicated	_	_	
	Inferred			
	ii iieii ea	_	_	

Pioneer Open Pit and Underground Mineral Resour	ces			
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	26,118	0.76	0.64
	Indicated	183,373	0.73	4.32
_	Measured+Indicated	209,491	0.74	4.96
	Inferred	106,875	0.47	1.63
Non-Refractory	Measured	10,825	0.71	0.25
	Indicated	36,220	0.88	1.02
	Measured+Indicated	47,046	0.84	1.27
	Inferred	67,104	0.37	0.80
Refractory	Measured	15,293	0.80	0.39
	Indicated	147,152	0.70	3.30
	Measured+Indicated	162,445	0.71	3.69
	Inferred	39,771	0.65	0.83
Pioneer Open Pit Mineral Resources	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	25,763	0.67	0.56
	Indicated	180,684	0.67	3.88
	Measured+Indicated	206,447	0.67	4.44
	Inferred	105,777	0.44	1.51
Non-Refractory	Measured	10,471	0.49	0.16
NOTE THE ITACIOTY	Indicated	34,713	0.70	0.78
	Measured+Indicated	45,183	0.65	0.76
	Inferred	66,603	0.03	0.73
Dafracton (Measured		0.80	0.73
Refractory		15,293		
	Indicated Adaptive to all Indicated	145,971	0.66	3.10
	Measured+Indicated	161,264	0.67	3.49
	Inferred	39,173	0.61	0.77
Pioneer Underground Mineral Resources				
	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	355	7.40	0.08
	Indicated	2,689	5.08	0.44
	Measured+Indicated	3,044	5.35	0.52
	Inferred	1,098	3.45	0.13
Non-Refractory	Measured	355	7.40	0.0
	Indicated	1,508	4.93	0.2
	Measured+Indicated	1,862	5.40	0.3
	Inferred	501	4.00	0.0
Refractory	Measured	_	_	
	Indicated	1,181	5.27	0.20
_	Measured+Indicated	1,181	5.27	0.20
	ivieasureu+iriuicaleu 📒	1,101	0.21	0.20

Pokrovskiy Open Pit and Undergrou	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	5,009	1.11	0.18
	Indicated	22,148	0.72	0.51
	Measured+Indicated	27,157	0.79	0.69
	Inferred	36,709	0.40	0.47
Non-Refractory	Measured	5,009	1.11	0.18
,	Indicated	22,148	0.72	0.51
	Measured+Indicated	27,157	0.79	0.69
	Inferred	36,709	0.40	0.47
Refractory	Measured	_	_	-
	Indicated	_	_	_
	Measured+Indicated	_	_	_
	Inferred	_	_	-
Pokrovskiy Open Pit Mineral Resou		T (1.1)	0 - 1- (- // A)	Martal (Mar. A.)
Total	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	4,182	0.70	0.09
	Indicated Measured+Indicated	20,951	0.62	0.42
	Inferred	25,134	0.63	0.51
N. D. C. I	Interred Measured	36,203	0.36	0.42
Non-Refractory	Indicated	4,182 20,951	0.62	0.09
	Measured+Indicated	25,134	0.63	0.42
		36,203	0.36	0.51
Defractor	Inferred Measured	30,203	0.30	0.42
Refractory			_	
	Indicated Measured+Indicated	_	_	
	Inferred		_	
Pokrovskiy Underground Mineral R		Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au
Total	Measured	827	3.20	0.09
	Indicated	1,196	2.45	0.09
	Measured+Indicated	2,023	2.76	0.18
	Inferred	506	2.96	0.05
Non-Refractory	Measured	827	3.20	0.09
·	Indicated	1,196	2.45	0.09
	Measured+Indicated	2,023	2.76	0.18
	Inferred	506	2.96	0.05
Refractory	Measured	-	_	-
	Indicated	-	_	-
	A 4			
	Measured+Indicated	_	_	

Tokur Total Mineral Resources (all open pit)

	Category	Tonnage (kt)	Grade (g/t Au)	Metal (Moz Au)
Total	Measured	11,952	1.30	0.50
	Indicated	16,096	1.06	0.55
	Measured+Indicated	28,048	1.16	1.05
	Inferred	10,706	1.09	0.38
Non-Refractory	Measured	11,952	1.30	0.50
	Indicated	16,096	1.06	0.55
	Measured+Indicated	28,048	1.16	1.05
	Inferred	10,706	1.09	0.38
Refractory	Measured	_	_	_
	Indicated	_	_	_
	Measured+Indicated	_	_	_
	Inferred	_	_	_

Notes:

- (1) Mineral Resources include Ore Reserves.
- (2) Mineral Resource estimates for Pokrovskiy, Pioneer, Malomir and Albyn were prepared internally by the Group in accordance with JORC Code 2012 as an update of the April 2017 statement audited by WAI; Mineral Resources for Tokur were reviewed by WAI in 2010 in accordance with JORC Code 2004 and there have been no changes to the Tokur estimates since that date.
- (3) Open Pit Mineral Resources for Pokrovskiy, Pioneer, Malomir and Albyn are constrained by conceptual open-pit shells at a US\$1,700/oz long term gold price; Tokur Mineral Resources have no open pit
- (4) The cut-off grade for Mineral Resources for open pit mining varies from 0.25 to 0.50g/t depending on the type of mineralisation and proposed processing method.
- (5) A cut-off grade of 1.5g/t is used to report Mineral Resources for potential underground mining at all sites with exception of Albyn; 1.0g/t cut-off was used at Albyn.
- (6) Mineral Resources are not Reserves until they have demonstrated economic viability based on a feasibility or pre-feasibility study.
- (7) Grade represents estimated contained metal in the ground and has not been adjusted for metallurgical recovery.
- (8) Figures may not add up due to rounding.

These updated estimates have been prepared by Anton Kornitskiy, a Competent Person who is a Member or Fellow of a 'Recognised Professional Organisation' included in a list that is posted on the ASX website from time to time (Chartered Geologist with the Geological Society of London and a European Geologist with European Federation of Geologists). Anton Kornitskiy is a full-time employee of the Company.