IMC Montan

International Economic and Energy Consulting

MINERAL RESOURCE AND RESERVE VALUATION

CJSC North-Western Phosphorous Company

Oleniy Ruchey Apatite-nepheline Ore Deposit

KIROVSK, MURMANSK REGION, RUSSIAN FEDERATION

Effective Valuation Date: January 1, 2011

FINAL REPORT (SUMMARY)

Prepared for
CJSC North-Western Phosphorous Company
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August 2011

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1 INTRODUCTION

1.1 Preface

This report was prepared by International Economic & Energy Consulting (IEEC) incorporated into IMC Montan, at the request of CJSC North-Western Phosphorous Company (hereinafter referred to as NWPC) with a view of valuation of JORC resources and reserves at Oleniy Ruchey deposit.

1.2 Capability Statement

IMC Montan is a group of international independent mining consultancies. The group includes IMC Group Consulting Limited (UK), DMT GmbH (Germany), WYG International (UK), International Economic and Energy Consulting and OOO IEEC (UK, Russia).

IMC Montan expertise covers the following: Competent Person Reports; resource audits and valuation of reserves for mining companies in compliance with international systems of classification; technical, economic and environmental expertise of projects; bankable feasibility study; project development with relation to a wide range of engineering and scientific studies.

More detailed information about IMC Montan is available on www.imcmontan.ru and the websites of the group's other companies.

Project Team and Site Visit

IEEC carried out the valuation with involvement of a group of international and Russian experts. Each expert is a staff member or an experienced associate partner of the company. A list of experts is given below.

John Bacharach	Project Director
Aleksey Zhura	Project Manager
Rakhimbek Kuzembaev	Mining Engineer
Neil Scott	Geologist, Competent Person
Alexander Pokusaev	Geologist
Andrey Postolatiev	Processing specialist
Galina Vasilieva	Environment specialist

IMC Montan team that visited the site included the following specialists: Rakhimbek Kuzembaev, Alexander Pokusaev, Neil Scott, Aleksey Zhura, Andrey Postolatiev, Galina Vasilieva.

IMC Montan would like to thank NWPC specialists, and particularly, S.G. Zershchikov, Technical Director, N.A. Kozhevnikov, Head of Technical Department, E.A. Semushina, Chief Geologist, for their effective cooperation and assistance in the preparation of this report.

1.3 Location of Deposit

The Oleniy Ruchey deposit planned for development by NWPC is located in the south-eastern part of iolite-urtite intrusion, that all apatite-nepheline ore deposits of the Khibins are allied to, within the territory under the jurisdiction of the municipal unit of the town of Kirovsk, Murmansk region, and is adjacent from the north-east to Nyorkpakhksky deposit mined by JSC Apatit Vostochny Mine. The distance from the Oleniy Ruchey mine which is under construction to the town of Kirovsk is about 20 km.

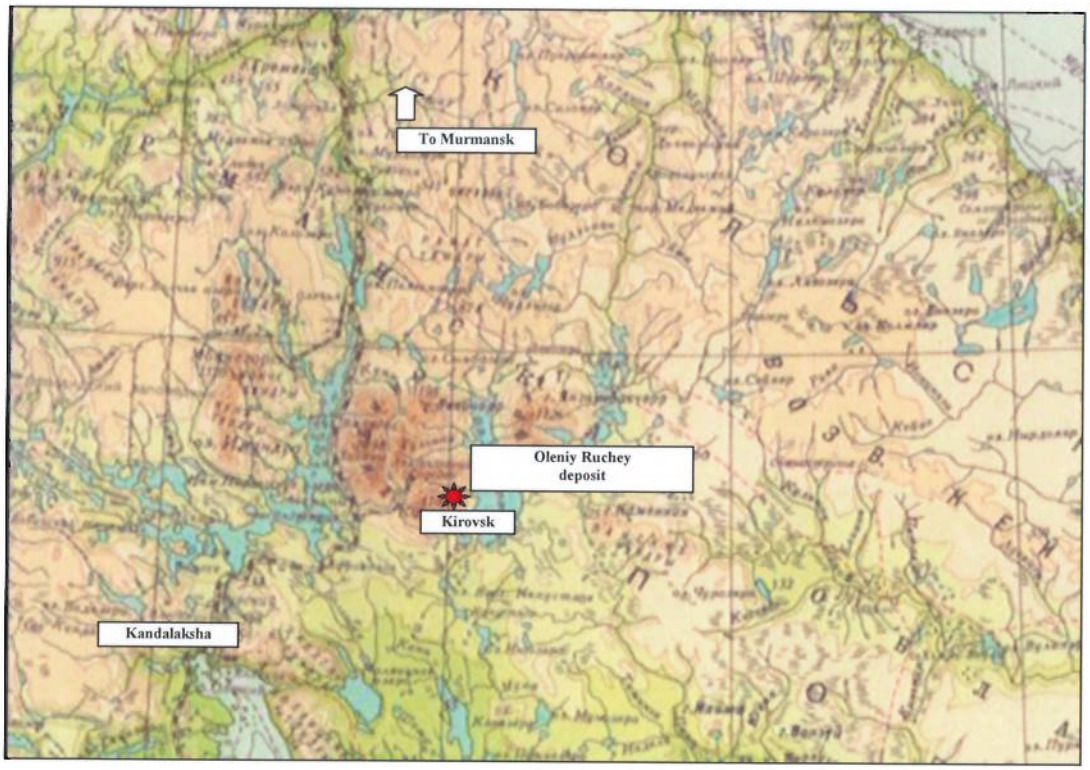


Figure 1-1 Map of Kirovsky district, Murmansk region

1.4 Geology

The Oleniy Ruchey ore bodies are characterized by ore deposits of complicated geometry forming multi-horizon ore zones. Structurally and texturally solid, massive, netted, banded, spotted, and breccias ores or their combinations can be identified.

The geological structure of the deposit is composed of the Paleozoic rocks of the Khibiny mafic Massif represented by nepheline syenites, iolite-urtite unit as well as by the Quaternary unconsolidated sediments. The Oleniy Ruchey deposit is confined to the north-eastern part of iolite-urtite intrusion pinch-out and is located within the south-eastern ore field of the Khibiny massif. The ore zone strikes to the north-east at 30-40°, dips to the north-west at angles of 30-50° on the south-western flank and up to 60-80° to the north-east. The length of the ore zone along the strike is 5 km.

The thickness of productive iolite-urtites varies from 1,000-1,200 m in the south-western part of the deposit to 300-500 m on the north-eastern flank.

The apatite-nepheline ores of the deposit are concentrated in two ore horizons: Upper, about 200 m thick, and Lower, 200-400 m thick separated from each other by ore iolite-urtites 200-300 m thick. The structure of the ore horizons is complex, multilayered. Three ore bodies (1, 2, 3) separated by iolite-urtites can be identified in the upper horizon. Ore bodies of the Upper horizon have outcrops.

In the Lower horizon that does not crop out 6 ore bodies can be identified, including three main ore bodies of complex morphology that split into lenses along the strike and along the dip. Each main ore body has a satellite ore body. The dipping of the Upper and Lower horizon ore bodies is north-western at angles of 40-60° and 45-70°. The total thickness of contiguous ore bodies in the Lower horizon is 100-350 m.

Towards the north-east a special separation of the ore bodies can be observed due to higher volumes of separating rocks and lower ore body thicknesses. The total thickness of ore bodies decreases to 50-60 m; in the interval between the horizons drillholes intersect numerous thin apatite-nepheline ore partings that do not correlate in the neighboring drillholes and cross-sections. The ore bodies and embedding rocks are crosscut by dykes of monchinites and tinguaites up to 10 m thick.

Geotechnical conditions of the Oleniy Ruchey are simple for surface mining. There are no unfavorable slickensides oriented towards the pit envelope. For underground mining the geotechnical conditions of the deposit are favourable as well. Ores and embedding rocks are of medium to high strength and are stable.

The deposit ores are not problematic to process. The detailed exploration of the deposit of 1978-1985 was done very thoroughly and in compliance with the standard procedure adopted for deposits of this type at the Soviet time.

The adopted drillhole spacing ensured full delineation of the ore zone to the dip, to the rise and along the strike. It is based on the method of consecutively wider spaced drillholes. The choice of the drillhole spacing is based on the USSR GKZ recommendations with reference to the exploration findings in the south-eastern ore field of the Khibiny Massif. It is in compliance with the Guidelines requirements for geological structure complexity group II deposits.

The drilling technique applied ensured high core recovery for the majority of drillholes, 84% on the average, and this was less than 80% only for 11 drillholes in 58 ore intersections. Directional surveys were carried out on a regular basis in 25-100 m intervals depending on the total length of the drillhole. Neutron activation logging to measure P_2O_5 based on methodology approved by the USSR GKZ was used for all drillholes. IMC Montan agrees that the quality of drilling is satisfactory.

Samples were taken for analysis of chemical, mineral composition of waste and ore as well as for investigation of technological and mechanical rock properties. Core sampling was used. 9,463 samples were taken, including 3,684 that were taken for reserve estimates. Sampling techniques, sample lengths and sample handling were satisfactory.

1.5 Resources and Reserves

USSR GKZ Protocol № 9888 of 18.12.1985 approved and recorded reserves of the Oleniy Ruchey deposit onto the state inventory in the following tonnages:

Table 1-1 Reserves of the Oleniy Ruchey Deposit as of 01.01.1985 (USSR GKZ)

Reserves	Category of reserves	Ore, '000 t	P_2O_5		Al_2O_3 total		Al_2O_3 acid soluble	
			Average grade, %	'000 t	Average grade, %	'000 t	Average grade, %	'000 t
Balance reserves								
Surface mine reserves (Upper horizon)	B	5,207	18.48	962	12.04	627	10.02	522
	C_1	11,084	13.6	1,508	12.87	1,427	11.3	1,253
	$B+C_1$	16,291	15.16	2,470	12.61	2,054	10.9	1,775
	C_2	1,455	10.24	149	16.01	233	13.2	192

Reserves	Category of reserves	Ore, '000 t	P_2O_5		Al_2O_3 total		Al_2O_3 acid soluble	
			Average grade, %	'000 t	Average grade, %	'000 t	Average grade, %	'000 t
Underground mine reserves (Lower horizon)	B	70,956	16.41	11,645	11.83	8,397	10.08	7,156
	C_1	237,949	16.18	38,501	12.12	28,834	10.36	24,641
	$B+C_1$	308,905	16.23	50,146	12.05	37,231	10.29	31,797
	C_2	58,810	13.64	8,025	13.21	7,773	11.42	6,719
Total reserves	**B**	**76,163**	**16.55**	**12,607**	**11.81**	**8,992**	**10.08**	**7,678**
	C_1	**249,033**	**16.07**	**40,009**	**12.15**	**30,261**	**10.4**	**25,894**
	$B+C_1$	**325,196**	**16.18**	**52,616**	**12.07**	**39,253**	**10.32**	**33,572**
	C_2	**60,265**	**13.56**	**8,174**	**13.28**	**8,006**	**11.47**	**6,911**
Off-Balance Reserves								
Reserves outside the open-pit envelope (Upper horizon)	C_1	14,871	12.47	1,854	13.01	1,935	11.79	1,753
	C_2	1,961	10.35	203	13.34	262	11.52	226

The reserves have not been re-estimated or re-approved since 1985. The deposit has not been mined, that is why there have been no changes of reserves. Currently according to the 5-GR form as of 01.01.2011 – change and reserve reporting to Rosnedra GKZ – there are 1985 reserves on NWPC balance not subject to any changes.

Having reviewed the extensive materials presented, IMC Montan believes that exploration of the Oleniy Ruchey in 1978-1985 was carried out on a high professional level and used old 'classical' methods that are assessed by IMC Montan as reliable.

Under the Russian classification the Oleniy Ruchey reserves are mineable reserves of categories $B+C_1+C_2$ within the boundaries of the designed mines subject to mining losses and dilution in the process of mining.

GKZ $B+C_1$ and C_2 category reserves within the design boundaries are equivalent to **Measured** and **Indicated resources** under the International classification systems. Part of these resources subject to losses and dilution factors is upgraded to **Proved and Probable Reserves.**

1.6 Mining

In compliance with a design brief prepared by NWPC for mining the deposit reserves, Giproruda Institute, S.-Petersburg, developed "Construction Design of Mining and Processing Complex (Mine) on the Base of the Oleniy Ruchey Apatite-Nepheline Ore Deposit" in 2008.

According to the design data the Mine production will make up 6 Mtpa of apatite-nepheline ores.

To ensure the Mine's early achievement of the above production level the design envisages mining reserves using a combined mining method – surface and underground mining. Currently the Mine is under construction in accordance with the design.

1.7 Processing

A flotation circuit producing apatite and nepheline concentrates as the main finished products was developed to process apatite-nepheline feed from the Oleniy Ruchey deposit.

On achieving the design capacity (6 Mtpa at 3 % moisture) the design technology for processing the Oleniy Ruchey apatite-nepheline ores will ensure production of apatite and nepheline concentrates of the following quantity and quality:

- Apatite concentrate at 39.1% P_2O_5 with 90.1% recovery. The output will make up 1,804,200 t at the concentrate yield of 31%
- Nepheline concentrate at 28.5% Al_2O_3 with 55% recovery. The output will make up 1,455,000 t at the concentrate yield of 25%

Tailings facilities will ensure storage of tailings in the tailings dam. The tailings facilities capacity is estimated for 20-year operations.

Stockpiling facilities will ensure storage and shipment of finished products to consumers both by trucks and railway.

1.8 Infrastructure

Location of the industrial site for the processing plant and other mining facilities was dependent on portals of three underground adits that are located 1.5 km to the south-east of the open-pit boundary. The area occupied by the industrial site facilities is 88 ha. All facilities are outside the avalanche zone. The industrial site facilities reference is carried out with regard to the local relief and the production flow sheet.

1.5 km to the south-east of the industrial site there is a tailings dam envisaged.

Concentrates haulage from the processing plant bin to the station of Titan in the first years of the Mine operations will be by dump-trucks. On achievement of the Mine's design ore production of 3 Mtpa, an access railway line from the station of Oleniy Ruchey to the connection point in the area of the station of Koashva will be started.

1.9 Environmental Protection and Restoration

NWPC activities satisfy the requirements of the Russian Environmental Law and are carried out in compliance with the Mine's construction design (EIA section) that was approved by experts.

The Mine construction is carried out with regard to technical solutions and environmental measures aimed at reduction of soil and water body pollution, decrease of impact on plants, reduction of the land area withdrawn.

The main target areas of the planned operations are subsurface resources, surface and underground water, land, partial disturbance of the terrain with production-triggered mineral formations. The land leased to NWPC is of no agricultural value. The main focus of land restoring operations at the construction sites will be on sanitary protection using the technology of creating a vegetation soil layer under a polymer cover without applying the top soil layer.

Ongoing restoration of the formed terrain is planned to be carried out in the course of mining.

1.10 Human Resources

In the beginning of 2011 the number of NWPC's employees was 237 people. Currently the employees are organising construction and implementing part of construction and capital development operations. Major part of the Mine's construction is carried out by Contractors having adequate numbers of qualified personnel.

On achieving full production capacity the total number of the Mine's employees will be 1,325 people, including: 1,081 workers and 244 managers, specialists and office workers. With reference to the adopted technological solutions using heavy-duty equipment the design number of employees is in line with the Mine's rated production capacity.

The Oleniy Ruchey Mine is located in the region with a developed mining sector. The labour sources for the Mine are the towns of Apatity, Kirovsk and the villages around. The company is implementing a recruitment programme; a potential skill pool has been created to carry out manning of the Mine.

1.11 Economic Valuation

IMC Montan carried out valuation of the Oleniy Ruchey reserves. The economic valuation demonstrated economic viability of further work aimed at development of the Oleniy Ruchey deposit.

2 RESOURCES AND RESERVES

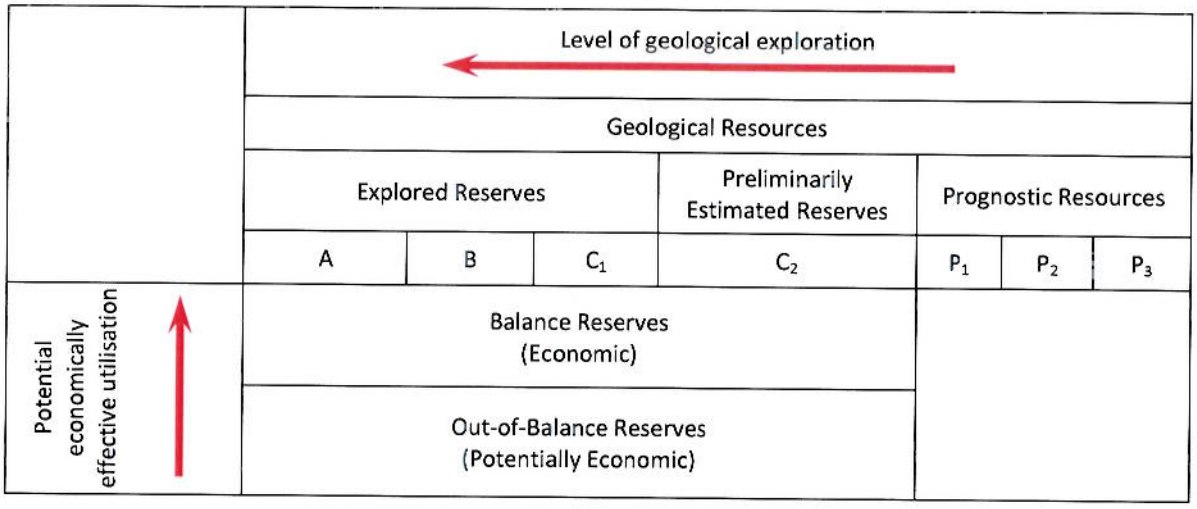
2.1 Russian Resource and Reserve Reporting System

Russian resource and reserve reporting system is based on the principles which were adopted in the former Soviet Union. Principles underlying the Russian system are similar to the ones used in other countries, especially Poland and China.

The system is based on two coordinate axes; the horizontal axis shows the degree of reserve exploration increasing right to left, and the vertical axis demonstrates the potential economically effective utilisation of reserves increasing bottom up.

Russian mining laws define a mineral deposit as a natural or artificial concentration of a mineral which can be mined with economic benefits. The term "reserves" means "identified tonnage of mineral, part of which can be mined cost effectively".

This system divides mineral resources into the following groups: Explored Reserves, Preliminarily Estimated Reserves and Prognostic Resources along the horizontal axis, and **Economic (Balance) Reserves** and **Potentially Economic (Out-of-Balance) Reserves** along the vertical axis.



2.2 International Resource and Reserve Estimation Standards

Several reporting codes exist in the international mining industry and the various regulatory authorities have now urged the conformity of codes and made reporting to code standards mandatory in any public documents issued by public companies. The chief Reporting Standards are:

- USA — USGS Circular 831
- Canada — OSC Instrument 43-101
- Australia — JORC Code
- UK, Ireland — IMMM Reporting Code
- South Africa — SAMREC Reporting Code

All have common terminology and nomenclature and recognise the difference between Mineral Resources and Ore Reserves. Conversion from a resource to a reserve requires the influence and application of "modifying factors". These include mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Resources are estimated geologically. Taking account of the modifiers, especially mining and economic they are upgraded to reserves. There are rigorous principles of quality assessment and data accounting for different commodities produced in mining sector.

International practice is increasingly using the Australasian JORC Code as an industry standard for reporting reserves.

The JORC Code defines **Measured**, **Indicated** and **Inferred Resources** as follows - in all three cases, they must have reasonable prospects of eventual economic extraction.

Measured Resources

A Measured Mineral Resource is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence.

Indicated Resources

An Indicated Mineral Resource is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence.

Inferred Resources

An Inferred Mineral Resource is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence.

Proved and Probable Reserves

Proved Reserve is the economically mineable part of a Measured Mineral Resource, while a Probable Reserve is the economically mineable part of an Indicated Mineral Resource. JORC Proved and Probable reserves should include allowance for dilution and loss.

Financial Section

Classification of mineral resources under the JORC Code mainly depends on reliability of the geological exploration of the deposit. Further mineral resources are upgraded to reserves based on a number of modifying factors, including mining (proposed realistic mining methods), metallurgical, economic, marketing, legal, environmental, social and governmental factors.

2.3 Comparison of Resource/Reserve Reporting Systems

An international committee, CRIRSCO (Committee for Mineral Reserves Reporting Standards), and representatives of GKZ, approved a uniform procedure for interpreting reserves statements under the Russian system in the framework of international reporting in September 2010. The GRIRSCO classification system is very similar to JORC Code.

Deposit complexity group on geological structure		Russian Reserve and Prognostic Resource Categories					
		Extent of Geological Exploration Details ←					
		A	B	C_1	C_2	P_1	P_2
Increase of deposit complexity ↓	I	Measured	Measured	Measured	Indicated	Inferred	
	II		Measured	Measured	Indicated	Inferred	
	III			Measured	Indicated	Inferred	
	IV			Indicated	Indicated	Inferred	Unclassified

2.4 Estimation of Oleniy Ruchey Resources and Reserves

In 2008 the Mine's main construction design solutions at the Oleniy Ruchey deposit were developed based on the reserves shown in Table 1-1 of this report. Based on the reserves as of October 01, 1985 a geological model of the deposit from the surface to level 90 m inclusive the 15 m interval was built in order to conduct the open-pit delineation and surface mine planning.

Classification of the reserves as balance reserves in the process of their approval in 1985 depended solely on the open-pit boundaries according to the feasibility study of mining parameters. The design solutions by JSC Giproruda in 2008 incorporated both balance and off-balance reserves into the open-pit boundaries. At the same time balance reserves of categories $B+C_1$ of 2.9 Mt were left outside the open-pit boundaries.

It is suggested that mining of the deposit should use a combined method, with the upper horizon using surface mining, and the lower horizon using underground mining. Oleniy Ruchey Open-pit includes mining of 23.2 Mt ore category $B+C_1$, C_2 balance reserves, and category C_1+C_2 off-balance reserves. Below are given the reserve tonnage and parameters of the open-pit for surface mining.

Table 2-1 Design Data of the Oleniy Ruchey Open-Pit (Giproruda, 2008)

Oleniy Ruchey open-pit	
Lower level	180 m
Depth	285 m
Reserve category	**Mt**
$B+C_1$ balance ore	13.4
C_2 balance ore	1.4
C_1+C_2 off-balance ore	8.4
Total reserves	**23.2**
Mineable reserves	**25.6**
Losses, %	2.7
Dilution, %	11.8

Below are GKZ balance reserves of the Oleniy Ruchey open-pit as of 01.01.2011 incorporated into mining.

Table 2-2 GKZ Balance Reserves as of 01.01.2011 within the Boundaries of the Oleniy Ruchey Open-Pit (Giproruda, 2008)

Reserve category	Ore, tonnes	P_2O_5 ,%	Al_2O_3 total, %	Al_2O_3 acid soluble, %
B balance	5,207,000	18.48	12.04	10.02
C_1 balance	8,158,000	13.60	12.87	11.30
Total: $B+C_1$	**13,365,000**	**15.50**	**12.55**	**10.80**
C_2 balance	1,455,000	10.24	16.01	13.20
C_1+C_2 off-balance	8,405,300	11.98	13.09	11.73
Total open-pit reserves	**23,225,700**	**13.90**	**12.96**	**11.29**

The planned Mine's production capacity (open-pit and underground mine) at the Oleniy Ruchey deposit is 6.0 Mtpa ore. The planned maximum open-pit production capacity is 3.0 Mtpa ore that is to be achieved in 2015. Balance reserves of the Oleniy Ruchey underground mine are given below.

Table 2-3 Balance Reserves of the Oleniy Ruchey Underground Mine

Average grade		Reserves (B+C1), Mt			
		GKZ reserves as of 01.01.2011	In pillar A under Nyorkpakhksky open-pit	In pillar B under Oleniy Ruchey open-pit	Deposit reserves net of pillars
Apatite-nephelene ores		308.91	88.15	22.57	198.19
%	P_2O_5	16.23	15.82	17.26	16.30
	Al_2O_3 acid soluble	10.29	10.65	9.89	10.18
	Al_2O_3 total	12.05	12.27	11.57	12.01

Table 2-4 GKZ Balance Reserves for Underground Mining. Oleniy Ruchey Underground Mine

Reserve category	tonnes	P_2O_5, %	Al_2O_3 total, %	Al_2O_3 acid soluble, %
B	70,956,000	16.41	11.83	10.08
C1	237,949,000	16.18	12.12	10.36
Total B+C1	308,905,000	16.23	12.05	10.29
C2	58,810,000	13.64	13.21	11.42
Pillar A (B+C1)	88,146,100	15.82	12.27	10.65
Pillar B (B+C1)	22,571,600	17.26	11.57	9.89
Pillars A and B total	**110,717,700**	**16.11**	**12.13**	**10.50**
Pillar reserves, category B	**25,432,043**	**16.11**	**12.13**	**10.50**
Pillar reserves, category C1	**85,285,657**	**16.11**	**12.13**	**10.50**

The active underground mine reserves are GKZ balance reserves net of reserves in temporary pillars under the Nyorkpakhk and Oleniy Ruchey open-pits.

Table 2-5 Balance Reserves of the Oleniy Ruchey Underground Mine Net of Reserves in Pillars as of 01.01.2011

Reserve categories	tonnes	P_2O_5, %	Al_2O_3 total,%	Al_2O_3 acid soluble, %
B	45,523,957	16.58	11.66	9.85
C1	152,663,343	16.22	12.12	10.28
Total B+C1	**198,187,300**	**16.30**	**12.01**	**10.18**
C2	58,810,000	13.64	13.21	11.42

Due to economic considerations off-balance ore was not incorporated into the open-pit boundaries in 1985 but at present the viability of mining this ore is justified, therefore it was partly incorporated into the raw ore resources within the open-pit boundaries.

JORC resource estimates were made based on official NWPC's data of geological reserves (in-situ ore) within the mining boundaries and by level.

Within the framework of this study IMC Montan carried out review of geological plans and cross-sections along the survey lines as well as review of the drillhole spacing based on the data of drilling operations available at the deposit, which allowed making more accurate conclusions as to classification of equivalent JORC resources.

With reference to the above, in January 2011, IMC Montan converted active reserves within the boundaries of the designed mines into JORC resources.

Table 2-6 JORC Resources within Design Boundaries of the Oleniy Ruchey Open-pit as of January 01, 2011

JORC-equivalent resource categories	Ore, tonnes	P_2O_5 ,%	Al_2O_3total,%	Al_2O_3 acid soluble. ,%
Measured	19,809,700	14.52	12.70	11.12
Indicated	3,416,000	10.30	14.48	12.24
Measured and Indicated	**23,225,700**	**13.90**	**12.96**	**11.29**

Table 2-7 JORC Resources within the Oleniy Ruchey Design Underground Mining as of January 01, 2011

JORC equivalent resource categories	Ore, tonnes	P_2O_5 ,%	Al_2O_3total,%	Al_2O_3 acid soluble ,%
Measured	198,187,300	16.30	12.01	10.18
Indicated	29,405,000	13.64	13.21	11.42
Measured and Indicated	**227,592,300**	**16.20**	**12.17**	**10.34**
Inferred	**29,405,000**	**13.64**	**13.21**	**11.42**

Thus, the total Oleniy Ruchey JORC resources (**Measured and Indicated**) within the boundaries of the designed Mine are **250.82 Mt** ore at the average grade of **15.77% P_2O_5.**

The **Inferred Resources** are **29.41 Mt** ore at the average grade of **13.64% P_2O_5.**

In addition to these, the Oleniy Ruchey deposit has **Measured resources** of B+C_1 categories of **110.72 Mt** ore at the average grade of **16.11% P_2O_5** in pillars under the Oleniy Ruchey and Nyorkpakhk open-pits.

Thus, the gross total **Measured** and **Indicated Resources** (including resources in pillars) are **361.54 Mt** at the average grade of **15.87% P_2O_5.**

In 2008-2010 NWPC carried out additional exploration of the deposit. It is expected that after completion of the additional exploration report and reserve re-estimation under new mining parameters (late 2011) the tonnage of JORC **Measured** and **Indicated resources** that are planned for surface mining will substantially grow. The increase of GKZ reserves is estimated at 15 Mt.

Reserve Estimate under International Standards

When upgrading JORC resources to reserves IMC Montan was guided by the following considerations:

- In compliance with the international standards of reserve reporting only **Measured** and **Indicated resources** may be upgraded to reserves;
- Resources are upgraded to reserves only for those mines that have an adequate detail level of business plans;
- Reserves are estimated until the end of the mine life. The optimum reserve life is supported by the experience of mining deposits with similar conditions within the same region and technical and economic design estimates;
- Upgrading of the resources to reserves included the expected losses and dilution estimated in the mine design.

Table 2-8 Expected Losses and Dilution

Parameters	%
Oleniy Ruchey deposit. Surface mining.	
Losses, %	2.7
Dilution %	11.8
Oleniy Ruchey deposit. Underground mining.	
Losses, %	16.2
Dilution %	17

Proved reserves were estimated as follows:

Proved reserves = (Measured resources) $* (1 - \Pi\phi/100)/(1 - 3\phi/100)$,

where 3_ϕ is dilution, %;

Π_ϕ is mining losses, %.

Probable reserves = (Indicated resources)$* (1 - \Pi\phi/100)/(1 - 3\phi/100)$

The **Proved and Probable reserves** under the international classification system estimated by these formulas are given below.

Table 2-9 JORC Reserves of the Oleniy Ruchey as of January 01, 2011

Reserve category	Ore, tonnes	P_2O_5 ,%	Al_2O_3total,%	Al_2O_3 acid soluble, %
Reserves in the Oleniy Ruchey open-pit				
Proved	21,853,558	13.04	12.70	11.12
Probable	3,768,444	9.32	14.48	12.24
Total	**25,622,002**	**12.49**	**12.96**	**11.29**
Reserves for the Oleniy Ruchey underground mining				
Proved	200,097,539	13.87	12.01	10.18
Probable	29,688,422	11.66	13.21	11.42
Total	**229,785,961**	**13.58**	**12.17**	**10.34**
Total Oleniy Ruchey reserves				
Proved	221,951,097	13.79	12.08	10.28
Probable	33,456,866	11.40	13.35	11.51
Total	**255,407,963**	**13.47**	**12.25**	**10.44**

Thus, total JORC reserves within the open-pit and underground mine boundaries at the Oleniy Ruchey deposit classified as **Proved reserves** are **221.95 Mt** ore at the average grade of **13.79% P_2O_5. Probable reserves** are **33.46 Mt** ore at the average grade of **11.40% P_2O_5.** The sum of **(Proved and Probable reserves)** is **255.41 Mt ore** at the average grade of **13.47% P_2O_5.**