

Amur Minerals

Cobalt-plated nickel

Since producing its conceptual open-pit study in 2015, Amur has continued its exploration programme, as well as announcing the results of metallurgical tests on its ore by Russia's premier metallurgical institute (Gipronickel), an open-pit/underground trade-off study and a review of costs (both undertaken by RPM). The results of these studies suggest a shift in likely mining to advance and increase underground operations. They have also allowed us to hone our assumptions to derive new valuations for each of Amur's five potential development options.

Year end	Revenue (US\$m)	PBT* (US\$m)	EPS* (c)	DPS (c)	P/E (x)	Yield (%)
12/15	0.0	(1.9)	(0.4)	0.0	N/A	N/A
12/16	0.0	(3.8)	(0.7)	0.0	N/A	N/A
12/17e	0.0	(1.8)	(0.3)	0.0	N/A	N/A
12/18e	0.0	(3.7)	(0.2)	0.0	N/A	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles and exceptional items.

March 2018 resource upgrade – now >1Mt nickel

Amur's FY17 field season increased resources at Kun-Manie by 51% to 1.2Mt of contained nickel (1.6Mt of nickel equivalent). While drilling in FY18 will allow it to refine the process flow sheet, drilling for resource expansion is now no longer a strategic imperative for Amur, allowing it to focus instead on mine development.

Valuation: Base case 15-46c depending on scenario

Fully diluted at a share price of 4.40p, we estimate updated valuations of the concentrate, low-grade matte, high-grade matte and refined metal options for Kun-Manie of 15c, 27c, 26c and 46c, respectively (vs 39c, 51c, 41c and 50c, previously), based on a 10% discount rate applied to forecast future dividends. However, much of this *prima facie* decline can be attributed to a 26.0% reduction in our forecast long-term nickel price, from US\$10.14/lb to US\$7.50/lb (vs a spot price of US\$6.00/lb as at 6 April). On a like-for-like basis, the equivalent valuations would instead have been 40c, 50c, 49c and 76c. In addition, one further option (denoted the 'combined' option) was considered, whereby the project is developed incrementally from a toll smelting operation to a fully integrated refinery over five years. Similarly diluted, we estimate the value of the 'combined' development option to be 26c/sh (or 53c/sh at US\$10.14/lb Ni). A key sensitivity in our valuations is the degree of future equity funding. In the event of pure debt funding (vs 80% 'base case'), these valuations increase to 45c for the toll smelting option, 105c for the low-grade matte option and 200c for the refinery option. Investors' attention is drawn to the similarity between the valuations for the low-grade matte, high-grade matte and 'combined' development option scenarios, in particular. For a mere US\$10.3m in additional equity funding therefore, investors are able to approximately double the value of their investment (from 15c/sh to 27c/sh) by upgrading the scope of the operation from simple concentrate production to low-grade matte production. However, for only an additional US\$0.9m beyond that, investors are approximately able to double the value of their investment once again (from 27c/sh to 46c/sh) by instead opting to build a fully integrated refining operation from the outset.

Five development options

Metals & mining

16 April 2018

Price 4.40p

Market cap £28m

US\$1.4060/£

Net cash (US\$m) on 30 June 2017 5.4

Shares in issue 637.9m

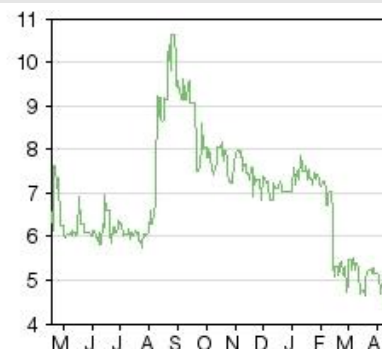
Free float 80%

Code AMC

Primary exchange AIM

Secondary exchange N/A

Share price performance



% 1m 3m 12m

Abs (14.6) (41.3) (35.3)

Rel (local) (15.7) (37.4) (35.1)

52-week high/low 10.6p 4.4p

Business description

Amur Minerals is an exploration and development company focused on base metal projects in Russia's Far East. The company's principal asset is the Kun-Manie nickel sulphide deposit in the Amur Oblast, comprising almost a million tonnes of contained nickel equivalent in at least five deposits.

Next events

Open pit evaluation/new resource area	Q218
Initiate gap analysis on updated PFS	Q218
Complete first phase of road design	Q218
Initiate second phase of road design	Q218
Initiate met-tests re Cu conc generation	Q218

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Amur Minerals is a research client of Edison Investment Research Limited

Investment summary

Far East Russian nickel sulphide developer

Amur Minerals has a 100% interest in the Kun-Manie project in the north-east corner of the Amur Oblast in Russia's Far East. Notwithstanding a pre-feasibility study (PFS) completed on the project in 2007, Amur has continued with exploration activity and, to date, has delineated a resource of 155.1Mt of ore containing 1,157kt of nickel or 1,600kt of nickel equivalent (NiE), making it the largest undeveloped nickel sulphide deposit in the immediate environs of China, Japan and Korea. In April 2015, Amur reported that it had completed the first of two internal assessments for developing the project by any one of four methods, from 1) a concentrate for third-party toll smelting, 2) owner-operator smelting in an electric arc furnace to produce a low-grade matte, 3) production of a high-grade matte via the addition of an oxygen plant, a converting furnace and an off-gas converter to the electric arc furnace, and, finally, 4) an option to refine the nickel to cathode precipitate metal via the addition of an electro-winning refinery to the plant. Amur was awarded a production licence by the Russian government in May 2015, but has since continued its exploration programmes ahead of producing either a Russian (TEO) or western feasibility study prior to development.

Valuation: Base case 15c/share to 46c/share depending on scenario

Based on the updated operating parameters implied by the most recent technical and economic studies, Edison estimates equity valuations for Amur, dependent on the actual development option chosen, as follows:

Exhibit 1: AMC equity valuations by development scenario (US cents per share)		
	Valuation* (US cents per share)	Required equity funding** (US\$m)
Toll smelting	15	138.1
Low-grade matte	27	148.4
High-grade matte	26	148.4
Refinery	46	149.3
Combined***	26	149.3

Source: Edison Investment Research. Note: *Calculated using a 10% discount rate applied to dividends.
 **Equity funding required to achieve maximum leverage ratio (defined as net debt/[net debt+equity]) of 80%.
 ***Two years of concentrate production for toll smelting, followed by one of low-grade matte production and one of high-grade matte production before achieving full production of refined nickel cathode in year 5.

A key factor in determining our ultimate valuation for Amur is the degree of future equity funding of capital expenditure. In the event of zero equity funding (ie debt funding alone), these valuations increase to 45c for the toll smelting option, 105c for the low-grade matte option and 200c for the refinery option.

Sensitivities: More sensitive to funding mix than to nickel price

In quantitative terms, a 10% change in the nickel price results in a 7-9c change in valuation (for all development scenarios), whereas a 10% change in costs results in a 2-3c change in valuation.

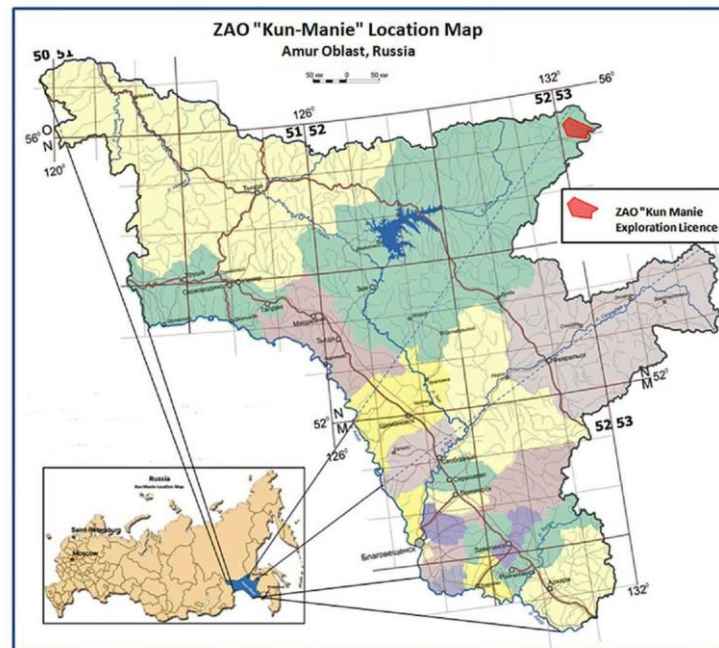
Financials: Net cash funds another field season

Amur had US\$5.4m of net cash as at 30 June 2017 after US\$2.8m of cash outflows over the course of the first six months of the year. We estimate a further US\$1.3m of cash outflows in H217, resulting in US\$4.1m of net cash as at 31 December 2017 – sufficient for almost one more field season and associated studies prior to development financing and capital expenditure towards the end of FY18.

Company description: Far East nickel developer

Amur Minerals has a 100% interest in the Kun-Manie project in the north-east corner of the Amur Oblast in Russia's Far East. The Kun-Manie project encompasses a 36.2km² area within the 950km² Kun-Manie exploration licence area and is located 700km north-east of the capital city of Blagoveshchensk on the Chinese border.

Exhibit 2: Kun-Manie location



Source: Amur Minerals

History

In April 2004 ZAO Kun-Manie, a wholly owned subsidiary of Amur, was granted an exploration licence to explore for nickel and related metals, including copper, cobalt, palladium and platinum, in the Kun-Manie licence area. Amur commenced seasonal field work (running from June to October) on the licence in 2004 and issued a JORC-compliant statement in 2007 covering three deposits located on the 40km-long Kurumkon trend, namely Maly Kurumkon, Vodorazdelny and Ikenskoe.

In November 2007, consultants SRK completed a pre-feasibility study (PFS, see page 6 below) for Amur, concluding that a project designed to produce a nickel concentrate had a net present value of US\$89m at a discount rate of 10% and nickel and copper prices of US\$7.50/lb and US\$1.50/lb, respectively.

Since 2007, exploration and drilling has been conducted on an ongoing basis and an updated resource estimate was compiled in late 2013 (and subsequently upgraded in April 2015, March-April 2016, February 2017 and March 2018), which included two additional deposits on the trend – Kubuk and Gorny.

In 2008, Kun-Manie was designated a Federally Strategic Project according to the 2008 amendment of Russia's subsoil law, the practical relevance of which is that 'strategic' projects must complete exploration activities before a production licence can be granted. To this end, a new protocol established that this exploration phase had now been completed.

In June 2014, Amurnedra (a sub-agency and regional representative of Rosnedra, the state licensing agency) completed its review of Amur's exploration activities and subsequently issued a

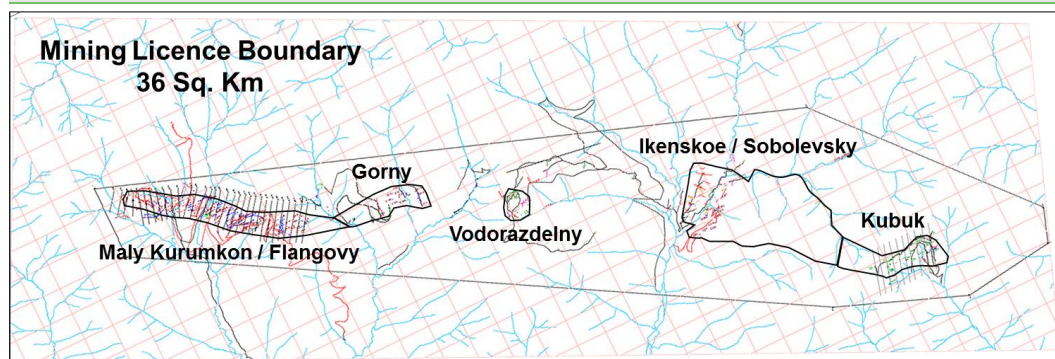
protocol confirming that the initial exploration phase of the Kun-Manie project had indeed been completed and that the company had met its obligations in the 950km² licence area under the terms of its original exploration licence – a key precursor in the conversion of a Federally Strategic Project held as an exploration licence to that of a production licence. In particular, the protocol confirmed that Amur had completed sufficient and substantial work to identify a 36.2km² area of economic interest, which supported the boundary limits for the mining application. In addition, it confirmed that the area located outside the area of mining interest had also been sufficiently explored, which allowed Amur to return 913.8km² of unwanted territory, which no longer warranted any further expenditure, to the Russian government.

As the initial exploration phase of the project had, at that point, been completed, the way was paved to progress to the next phase of development under the Russian system, namely a detailed exploration and production assessment of the project, conducted under the terms of a new production licence (see Permitting section, below). Note that, although the Russian licensing process is lengthy, Amur reports that it has found it to be both explicit and navigable.

Geology

Initially, Amur undertook an extensive soil geochemical survey covering two areas of its Kun-Manie lease, totalling 57.5km². The first (and largest) area is the 15km long and 2.5km wide Kurumkon Trend, which was the primary exploration target in the original licence area, containing the Maly Kurumkon-Flangovy, Gorny, Vodorazdelny, Ikenskoe-Sobolevsky and Kubuk deposits, which are located within a 20km segment of the 40km trend and are the subject of Amur's mining licence (and SRK's 2007 Kun-Manie PFS). By expanding its short-term exploration strategy while simultaneously pursuing its mining licence, Amur greatly improved its understanding of the geological controls on Kun-Manie's mineralisation. The locations of all these deposits (all within the area that is the subject of Amur's mining licence) are shown in Exhibit 3 below.

Exhibit 3: The five currently defined exploration areas at Kun-Manie



Source: Amur Minerals

Reserves and resources

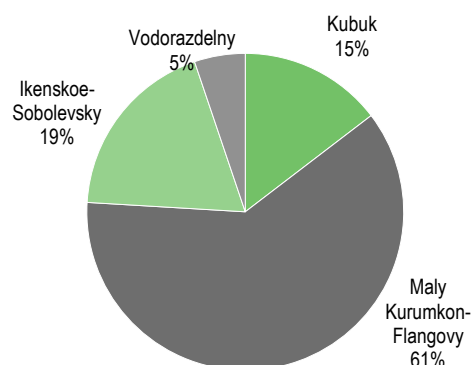
On 20 March 2018, Amur announced an updated mineral resource estimate, as compiled by consultants RPM, as follows:

Exhibit 4: Kun-Manie mineral resource estimate, March 2018 (0.4% cut-off grade, excluding Gorny)

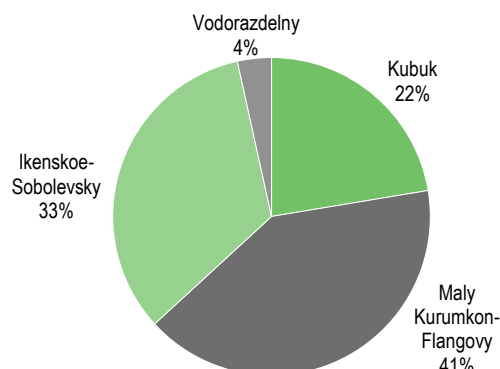
Orebody	Tonnage (Mt)	Ni (%)	Ni (t)	Cu (%)	Cu (t)	Co (%)	Co (t)	Pt (g/t)	Pt (t)	Pd (g/t)	Pd (t)
Kubuk (KUB)											
Measured	0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Indicated	32.9	0.69	226,000	0.19	63,000	0.014	4,700	0.13	4.3	0.12	3.9
Sub total	32.9	0.69	226,000	0.19	63,000	0.014	4,700	0.13	4.3	0.12	3.9
Inferred	4.7	0.70	33,000	0.19	9,000	0.014	700	0.12	0.6	0.12	0.6
Total	37.6	0.69	259,000	0.19	72,000	0.014	5,400	0.13	4.9	0.12	4.5
Ikenskoe (IKEN)											
Measured	10.6	0.71	75,000	0.18	19,000	0.011	1,100	0.22	2.3	0.26	2.8
Indicated	13.6	0.66	89,000	0.17	24,000	0.012	1,700	0.18	2.4	0.20	2.8
Sub total	24.2	0.68	164,000	0.18	43,000	0.012	2,800	0.18	4.7	0.23	5.6
Inferred	27.8	0.80	222,000	0.23	63,000	0.017	4,600	0.19	5.2	0.19	5.3
Total	51.9	0.75	386,000	0.20	106,000	0.014	7,500	0.19	9.9	0.21	10.8
Vodorazdelny (VOD)											
Measured	0.6	0.74	5,000	0.22	1,000	0.012	100	0.29	0.2	0.32	0.2
Indicated	3.2	0.85	27,000	0.21	7,000	0.017	500	0.16	0.5	0.16	0.5
Sub total	3.8	0.85	32,000	0.21	8,000	0.016	600	0.20	0.7	0.19	0.7
Inferred	1.0	0.81	8,000	0.22	2,000	0.016	200	0.17	0.2	0.16	0.2
Total	4.8	0.83	40,000	0.21	10,000	0.017	800	0.18	0.9	0.18	0.9
Maly Kurumkon-Flangovy (MKFL)											
Measured	0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Indicated	57.5	0.77	445,000	0.22	124,000	0.015	8,900	0.15	8.8	0.16	9.3
Sub total	57.5	0.77	445,000	0.22	124,000	0.015	8,900	0.15	8.8	0.16	9.3
Inferred	3.4	0.80	27,000	0.22	7,000	0.017	600	0.16	0.5	0.15	0.5
Total	60.9	0.78	472,000	0.22	131,000	0.015	9,500	0.15	9.3	0.16	9.8
Total measured	11.2	0.71	80,000	0.18	20,000	0.012	1,300	0.23	2.5	0.27	3.0
Total indicated	107.0	0.74	787,000	0.20	217,000	0.015	16,200	0.15	16.0	0.15	16.6
Total measured & indicated	118.2	0.73	867,000	0.20	237,000	0.016	17,500	0.16	18.5	0.17	19.6
Total inferred	37.0	0.79	290,000	0.22	81,000	0.017	6,000	0.17	6.4	0.18	6.6
Grand total	155.1	0.75	1,157,000	0.21	319,000	0.015	23,500	0.16	24.9	0.17	26.0

Source: Amur Minerals, Edison Investment Research. Note: Totals may not add up owing to rounding.

The mineral resource update followed the exploration work that Amur conducted during the 2017 field season, which was successful in linking the neighbouring Ikenskoe and Kubuk deposits. As a result, together the two deposits (which are now interpreted to be contiguous – see page 14 and Exhibit 3) constitute the largest single mineralised zone at Kun-Manie, surpassing the erstwhile largest deposit, Maly-Kurumkon, by 28.6Mt in ore tonnes and 173kt in contained nickel, or by 47.0% and 36.7%, respectively:

Exhibit 5: Kun-Manie resource by area (contained Ni tonnes), February 2017


Source: Amur Minerals, Edison Investment Research

Exhibit 6: Kun-Manie resource by area (contained Ni tonnes), March 2018


Source: Amur Minerals, Edison Investment Research

In nickel and gold (as an illustrative exercise) equivalent, Amur's total mineral resource can therefore be stated as follows (at prevailing metal prices at the time of writing on 6 April):

Exhibit 7: Kun-Manie total mineral resource estimate, nickel and gold equivalent*

	Tonnage (Mt)	Grade	Contained metal
Nickel equivalent	155.1	1.03% NiE	1.600Mt
Gold equivalent	155.1	3.18g/t AuE	15.9Moz

Source: Edison Investment Research, Amur Minerals. Note: *At prevailing metals' prices at the time of writing.

Based on Edison's estimated end-FY17 net cash position of US\$4.1m, Amur's enterprise value of US\$34.0m equates to US\$29.41 per total nickel resource tonne.

In the meantime, RPM Global has undertaken sufficient work studies to determine that all of the reported resource has a reasonable prospect of eventual economic extraction. To date (and for the purposes of Edison's valuation – see page 19, below), 64% of the measured and indicated resource is defined as being mineable. Moreover, as the deposits are all near surface, it could be expected that a high rate of conversion from mineral resource to mineable reserve will be achieved. Self-evidently, a further 37.0Mt of inferred resource may also be upgraded to reserve status in due course.

Permitting

In May 2015, Amur announced that Russian Prime Minister Dmitry Medvedev had approved the company's detailed exploration and mine production licence for Kun-Manie until July 2035. This then enabled the Ministry of Natural Resources (MNR) and Rosnedra to issue the licence, subject to Amur paying RUB23.6m (c US\$429,000 at the time of payment) within 30 days of the registration of the final document, which was duly done. The licence grants Amur's wholly owned subsidiary ZAO Kun-Manie the rights to recover all value from the minerals defined to be present at Kun-Manie, including nickel, copper, cobalt, platinum, palladium, etc. Note that all drilled mineralisation lies within the limits of the production licence. In due course, additional work related to metallurgy and engineering will be compiled in a final, permanent Russian feasibility study (TEO) to be approved by the GKZ (State Reserves Committee), including additional results for detailed exploration.

Included in Amur's responsibilities under the terms of its new licence are:

- that the results of pre-production evaluation are to be presented to the government by 1 December 2020;
- the mining plan is to be approved by the government no later than 1 June 2022;
- a recultivation/site remediation plan is to be submitted to the government one year before decommissioning facilities; and
- annual activity reports must be submitted to Rosnedra and Amurnedra.

We note that, if during the life of the licence, exploration results further increase the size of the resource and/or reserve, the company can apply to have the production licence expanded and extended.

SRK pre-feasibility study (PFS)

In late 2007, the design, configuration and economics of a project at Kun-Manie were outlined in a pre-feasibility study (PFS) undertaken by SRK Consulting (Russia), based on the resources defined to be present in a portion of Maly Kurumkon, Vodorazdelny and Ikenskoe at the time. The study indicated that the defined mineralisation could support three open-pit mines; that subsequent

treatment of the (sulphide) ores could be achieved by conventional crushing, grinding and flotation; and that the final concentrate would be suitable for contract smelting, with Amur receiving an estimated 70% of the value of the nickel and 50% of the value of the copper contained in concentrate (note that no payable value was attributed to cobalt, platinum and/or palladium by-products).

Assuming production and processing at a rate of 4.0Mtpa over a 10-year life, SRK estimated production of c 15,900t Ni and 4,300t Cu in concentrate pa and a project net present value (discounted at 10%) of nearly US\$89m at nickel and copper prices of US\$7.50/lb (US\$16,538/t) and US\$1.50/lb (US\$3,308/t), respectively.

All costs were included in the analysis, including staff costs, mining, transport to and from site, loading and railway transport to the third-party smelter. However, potential cobalt, platinum and palladium co-product revenues were excluded from the analysis. In addition, while the optimal pit outlines were determined, these were not specifically translated into optimum production schedules. As a result, some higher-grade production was delayed until later years, resulting in a reduction of the project's NPV compared to an optimised result.

In its conclusion to the 2007 Technical Study for Kun-Manie, SRK listed seven points requiring further work, two of which related to the resource. The first related to the grade of the resource and recommended further investigation of the potential to mine a higher grade in earlier years. The second stated that Amur should look at the potential to define additional resources at the project. Also, as announced on 18 May 2012, metallurgical test results conducted by SGS Minerals demonstrated a beneficial reduction in magnesium oxide (MgO) levels globally from 16% to c 11.5%. SRK's remaining points related to the cost of a process plant, royalty rates and tax holidays and further investigations into site access roads.

Developments subsequent to the PFS (2007)

Work subsequent to the PFS substantially modified the original design concept of the project. Among other things, this included improved metallurgical recoveries and a more than doubled resource base, improved Russian taxation and royalty structures and reduced smelter penalty fees, all of which conspired to necessitate a comprehensive review of SRK's original specification.

Reserves and resources

In August 2014, Amur updated the defined reserve at Maly Kurumkon-Flangovy, Vodorazdelny and Ikenskoe-Sobolevsky. The cumulative contained proved and probable reserve was estimated to be 39.2Mt ore containing 219,000t Ni and 58,100t Cu. The reserve was based on JORC 2012 reporting standards and a nickel price of US\$8.50/lb (US\$18,740/t) and was derived from SRK resource models. Runge, Pincock, Minarco (RPM) then uploaded the resource models to the Whittle open-pit optimisation algorithm in order to generate a series of open-pit mine shells for two distinct scenarios:

- Existing reserves, based on the promotion of mineral inventory from the existing measured and indicated resource categories into the proven and probable reserve categories.
- Upside potential, based on the inclusion of inferred resources as well. These pit shells were inevitably much larger than the reserve shells. Nevertheless, a comparison of the two also allowed Amur to determine where in-fill drilling was necessary to convert inferred resources into the higher-quality resource categories for subsequent inclusion in reserve statements.

The generated shells for each of the two scenarios were derived from conventional parameters, such as pit slope angles (45°), mine dilution (5%), Q214 operating costs estimates, metallurgical recoveries (80.4% Ni and 90.2% Cu) and metal payability (70% Ni and 50% Cu, but 0% for Co, Pt

and Pd). In the process of conducting its study, RPM also confirmed that there was potential to mine some of the ore in the lower levels of the pits by underground methods and that the open pits might well therefore be reduced in size to give an overall ratio of 50:50 of ore from underground vs open-pit sources.

The changes to the design along with inflation and the devaluation of the rouble at that time also resulted in the need for a comprehensive update of operating costs. In Q115, Amur calculated operating costs using first principle engineering practices. The updated Q115 operating costs for both underground and open-pit operations at that time are shown in Exhibit 8 below.

Exhibit 8: Kun-Manie open-pit and underground unit cost estimates (US\$)		
Cost centre	Open pit	Underground
Mining cost per tonne	1.58	11.88
Processing cost per ore tonne	10.38	10.38
Tailings handling cost per ore tonne	0.14	0.14
Concentrate transport to rail per ore tonne	1.72	1.72
General & administrative per ore tonne	2.15	2.15
Rail transport to smelter per ore tonne	12.09	12.09
Smelter penalties per ore tonne	3.80	3.80
Source: Amur Minerals 2015		

Note that, over the then projected 15-year life of the operation, approximately one half of production was anticipated to be derived from open-pit sources and one half from underground sources.

Metallurgy

The mineralisation at Kun-Manie is sulphidic in character and independent studies by both Russian (Sibsvetmetniproject) and western (SGS) metallurgical contractors have indicated that it can be recovered into concentrate using historically proven, simple flotation recovery methods. On 10 May 2012, Amur announced the results of flotation test work was undertaken on 24 sulphide ore samples representing six grade ranges taken from the drill reserve portions of the Maly Kurumkon, Vodorazdelny and Ikenskoe deposits. Importantly, the samples selected for SGS's flotation testing were considered to be more representative of life-of-mine operating parameters and the likely variability of the ore delivered to the process plant than those originally used by SRK. A comparison between the two is shown in Exhibit 9 below.

Exhibit 9: Change in metallurgical recoveries				
Metal	Average life-of-mine grade	SRK utilised metallurgical recovery (%)*	SGS projected metallurgical recovery (%)	Change (%)
Nickel	0.57%	75.9	77.8	+2.5
Copper	0.15%	72.9	90.4	+24.0
Cobalt	0.01%	57.0	68.6	+20.4
Platinum	0.13g/t	51.1	73.9	+44.6
Palladium	0.14g/t	40.8	82.4	+2.0
Source: Amur Minerals. Note: *2007 pre-feasibility study.				

As a result of the improved recoveries, SGS was able to project markedly higher potential nickel and copper concentrate grades of 9.6% (vs 7.0% used in SRK's 2007 PFS) and 2.9% (vs a 2.4% life-of-mine average), respectively.

Penalty elements

The corollary of increasing concentrates payability was a reduction in the concentration of penalty elements. Two of the most important such compounds with respect to nickel processing are arsenic (As) and magnesium oxide (MgO). In this case, a significant reduction of MgO was achieved by SGS, with levels reduced from 16% (that used in the 2007 SRK pre-feasibility study) to below 11%. However, accurate assessment of the positive impact of any reduction in MgO content on cash flows will only be known after further work has been undertaken by Amur's consultants. In the

meantime, it is known from previous drill programmes that Kun-Manie nickel ores are relatively free of arsenic; however, accurate assessment of arsenic levels will still need to be calculated for the purpose of agreeing any future third-party smelting contract.

Conceptual open-pit study (2015)

Taking into account all of the above developments, in 2015 Amur conceived a conceptual open-pit study based on a modified design for the development of Kun-Manie.

Scale and process

Compared to the three pits proposed in the PFS, Amur's Conceptual open-pit study in 2015 proposed deriving production from four open pits located along the Kurumkon Trend plus two underground mines. Whereas the PFS projected a throughput rate of 4.0Mtpa, this was expanded to 6.0Mtpa to produce 350,000t concentrate pa (albeit via fundamentally the same process route of crushing, grinding and floating the sulphide ore). The recovery of nickel was estimated to be 80% of the mine delivered grade of 0.57% nickel. Copper recoveries were projected to be approximately 90% with a grade of 0.15%. Mill tailings were to be stored in an impoundment area adjacent to the mill site.

Four options for project development

At that time, specific metallurgical test work required to assess the final configuration of the operation had yet to be determined. However, metallurgical test work completed by SGS indicated that it would also be possible to generate a near-final marketable matte and/or smelter product. On 16 April 2015, Amur reported that it had completed the first of two internal assessments for constructing an owner-operated smelter in lieu of contract smelting Kun-Manie concentrate. The study envisaged the smelter being situated on the Baikal-Amur railway line near Verknezeisk or Gorny to simplify the importation of associated consumables (eg coal and limestone). As a result, four potential development options were conceived, reflecting four different, potential end products:

- Concentrate for third-party toll smelting.
- A low-grade matte (approximately 25% combined nickel, copper and cobalt) by smelting the concentrate in an electric arc furnace to produce a product suitable for on-sale and future smelting and refining.
- Alternatively, the low-grade matte could be further upgraded into a high-grade matte via the addition of an oxygen plant, a converting furnace and an off-gas converter to the electric arc furnace. In contrast to the 25% of combined metals in the low-grade matte, the high-grade matte would contain approximately 70% combined nickel, copper and cobalt and would (typically) be sold to a refinery for onward processing.
- The final product – a cathode precipitate metal – would be produced by the addition of a refinery to the circuit, comprising leaching, solvent extraction electrowinning (SX-EW) and precipitation plants. In this case, the recovered metal would include nickel and copper cathodes, cobalt precipitate and platinum and palladium metals.

Economically, the development of an on-site smelter would obviate the US\$12.09/t expense of railing concentrate to a third-party toll smelter, but would incur additional smelting and refining costs. At the time, the blended average operating cost per tonne over the life of the operation was estimated to be US\$34.86 per ore tonne, as shown in Exhibit 10 below.

Exhibit 10: Kun-Manie open-pit and underground unit cost estimates (US\$)

Cost centre	Owner operated smelter option
Mining cost per tonne	9.10
Processing and tailings cost per ore tonne	10.51
Concentrate transport per ore tonne	1.72
General & administrative per ore tonne	2.26
Rail transport to smelter per ore tonne	0.00
Smelter penalties per ore tonne	0.00
Smelting cost per ore tonne	11.27
Total cost per ore tonne	34.86

Source: Amur Minerals, 2015

Note that, in the case of Amur developing an owner-operated smelter, it would also benefit from the absence of toll smelter payability deductions (estimated at 30% for nickel and 50% for copper) and allow it to manage its own magnesium oxide balance. Potentially, it would also provide Amur with the opportunity to toll smelt on behalf of other third parties with excess concentrate with access to the Baikal-Amur railway line.

Including owner-operated smelter options, capital expenditure estimates for the four development options were as follows:

Exhibit 11: Kun-Manie conceptual open pit study 2015 capex estimates (US\$m)

	Toll smelting		Low-grade matte		High-grade matte		Refinery	
	Initial	Sustaining	Initial	Sustaining	Initial	Sustaining	Initial	Sustaining
Infrastructure & permanent facilities								
Studies	5	0	5	0	5	0	5	0
320km access road	312	7	312	7	312	7	312	7
Power	118	3	118	3	118	3	118	3
Site facilities	10	0	10	0	10	0	10	0
EPCM (road, power facilities)	6	0	6	0	6	0	6	0
Processing	133	4	133	4	133	4	133	4
Tailings	14	23	14	23	14	23	14	23
Electric furnace smelter	0	5	127	5	127	5	127	5
Converter smelter	0	3	0	3	190	3	190	3
Refinery	0	3	0	3	0	3	342	3
Smelter infrastructure	0	0	22	0	22	0	22	0
Haul roads	10	20	10	20	10	20	10	20
Ikenskoe diversion	0	0	0	0	0	2	0	2
Total fixed assets	608	68	757	68	947	70	1,287	71
Mobile equipment								
Transportation fleet	15	29	15	29	15	29	15	29
Mining fleet	79	150	79	150	79	150	79	375
Total mobile	94	179	94	179	94	179	94	404
Grand total	702	247	851	247	1,041	249	1,381	475

Source: Amur Minerals, 2015. Note: Totals may not add up owing to rounding.

Transportation

The original concept was always for the flotation concentrate to be trucked 320km from site to the rail head at Ulak located on the Baikal-Amur railway for onward transportation by rail to a commercial smelter. However, since Amur was looking at developing an owner-operated smelter, the road design was similarly upgraded to handle year-round operations, being widened to two lanes with an increase in the size of the associated maintenance fleet.

Power

In contrast to the earlier PFS, Amur's conceptual open-pit study assumed that power was to be generated on site using diesel generator sets as opposed to via an extension of the grid, thereby obviating c US\$288-360m of power line construction costs. This marked a substantial change from the scenario envisaged at the time of SRK's PFS, when the local utility stated that a power line

would be constructed at its own expense. A total of 40MW of installed capacity was planned. Alternatives, such as wind, hydroelectric, etc, were also considered.

Water allotment

In May 2015, Amur announced that it had obtained a 112km² water allotment adjacent to the planned mill site at Kun-Manie. The water allotment area included the Maia River and eight of its drainages and was examined using various geophysical survey methods and subsequently drilled (c 20 holes of 100m each, on average) to determine the sources from which water may be extracted (including the provision of potable water to support a 1,000-person operation). Studies included an assessment of ice formation and its thickness and impact on the availability of water. These surveys also provided valuable information in establishing permafrost limits and depths.

Developments post the conceptual open-pit study

Two important developments subsequent to the conceptual open-pit study in 2015 include the first production-scale metallurgical test work performed by Gipronickel in 2017 and ongoing exploration by Amur in the Kun-Manie licence area.

Metallurgical test work results

On 11 January 2017, Amur announced the results of Gipronickel's metallurgical test programme on a c half tonne sample of ore derived from half core from three drill holes located at Maly Kurumkon-Flangovy (representing 60% of Kun-Manie ore by tonnage).

The Gipronickel results marked the first production-scale test work from the Kun-Manie licence area and, owing to their larger size, were therefore presumed to be more reflective of the actual production process than those calculated from SGS's bench-scale tests. Prior flotation test work on the sulphide ores by SGS was concluded on 12 samples covering six incremental grade ranges distributed throughout the JORC-drilled areas of MKFL and Kubuk. The results of these tests were released to the market in August 2016 for a 0.7% nickel grade (calculated as an average of recoveries from 0.6% Ni and 0.8% Ni) and are compared to the Gipronickel results for the half tonne bulk sample (actually 443.9kg), which had an actual nickel grade of 0.7% (see Exhibit 12, below).

Exhibit 12: MKFL metallurgical recovery comparison, Gipronickel vs SGS (%)

Recovery (%)	Nickel	Copper	Cobalt	Platinum	Palladium	Silver	Gold
SGS (average recovery at 0.7% Ni grade)	69.2	77.9	53.3	49.5	58.3	49.5	53.4
Gipronickel (0.7% Ni grade)	80.6	83.8	61.4	59.6	82.3	70.5	63.7
Difference (percentage points)	+11.4	+5.9	+8.1	+10.1	+24.0	+21.0	+10.3

Source: Amur Minerals, Edison Investment Research

In addition to issues of comparability with SGS's result, the 0.7% Ni grade of the half tonne sample also approximates the 0.75% Ni average grade of the mineable reserve calculated by RPM in its open-pit/underground production trade-off study. Notwithstanding its larger size, recoveries from the Gipronickel half tonne sample were self-evidently materially higher than the results achieved by SGS. In part, this may be attributed to the fact that the SGS test work involved coarse pulverisation of the samples and included older material that was likely to have partially oxidised, resulting in lower recoveries. In addition, Gipronickel employed a two-stage grinding process such that, after initial grinding and concentrate generation, the reject stream was reground to allow for the recovery of a second concentrate.

Mass-pull considerations

Ongoing analysis of the metallurgical characteristics of the Kun-Manie ore bodies by Gipronickel is in the form of the processing of a 7.5t bulk sample recovered in the 2016 drill programme. In the meantime, the Gipronickel results also indicated a higher recovery to concentrate in the form of a higher mass-pull than previously calculated and higher concentrate grades of 8.58% Ni and 2.10% Cu. This created the potential for a consequent reduction in fleet transport and in infrastructure capex (eg via a smaller concentrate treatment facility) and for additional capex savings (eg via the requirement for a smaller flash furnace) in the event that Amur opted for a matte or refinery development option.

However, it should be noted that Amur will have to undertake additional work programmes, involving drilling pre-resource exploration targets and laboratory test programmes for these increased concentrate grades to be deemed applicable to Kun-Manie as a whole.

RPM open-pit/underground production trade-off study

Amur's metallurgical test work announcement followed the release of the results of a trade-off study between open-pit and underground mining, conducted by RPM in late December, which identified a potential mineable reserve of 44.5Mt of ore at grades of 0.75% Ni and 0.19% Cu at MKFL (cf a mineable reserve of 45.5Mt identified in Amur's preliminary economic assessment [PEA], at an average grade of 0.53% Ni and 0.15% Cu). Key differences between the RPM study and the original PEA are a materially higher underground component of the overall mining operation and materially higher grades overall, as shown below:

Exhibit 13: RPM mining trade-off study results compared to original PEA					
Area	Parameter	RPM study	PEA	Change (units)	Change (%)
Underground	Ore (Mt)	31.7	28.1	3.6	12.8
	Ni grade (%)	0.79	0.49	0.30	61.2
	Cu grade (%)	0.19	0.15	0.04	26.7
Open pit	Ore (Mt)	12.85	17.4	-4.55	-26.1
	Ni grade (%)	0.63	0.59	0.04	6.8
	Cu grade (%)	0.18	0.16	0.02	12.5
Total	Ore (Mt)	44.5	45.5	-1.0	-2.2
	Ni grade (%)	0.75	0.53	0.22	41.5
	Cu grade (%)	0.19	0.15	0.04	26.7
	Contained Ni (kt)	332.2	241.0	91.2	37.8
	Contained Cu (kt)	83.5	69.3	14.2	20.4
	Waste	43.7	47.3	-3.6	-7.6
	Strip	3.40	2.73	0.67	24.5
	Ni to conc (kt)	251.7	192.8	58.9	30.5
	Cu to conc (kt)	65.4	62.4	3.0	4.8
Source: Amur Minerals, Edison Investment Research					

The RPM study assumed that the nickel and copper were together recovered into an aggregate 2.5Mt of concentrate (ie a 5.6% mass-pull) containing an average of 9.9% Ni and 2.9% Cu (ie based on SGS, rather than Gipronickel, grade-recovery curves). In addition, the RPM study was conservative in that it assumed Western Australian underground mining costs, contributing to a total operating cost of US\$40.02 per ore tonne. It also did not include the results of the 2016 field season.

RPM review of costs

As stated previously, up until late 2016, Amur calculated its reserves at Kun-Manie with reference to Australian, rather than Russian, underground mining costs. In order to correct this obvious overstatement, in late 2016, the company commissioned RPM to prepare an independent review of projected operating cost estimates, which the latter duly completed in July 2017, as follows:

Exhibit 14: RPM operating cost estimate summary

Cost centre	Units	Open pit	Underground
Mining costs			
Open-pit mining	US\$/t waste	1.60	
Open-pit mining	US\$/t ore	1.73	
Average open-pit mining (3:1 strip ratio)	US\$/t ore	6.53	
Average underground mining	US\$/t ore		7.44
Processing costs			
- Plant labour cost	US\$/t ore	0.72	0.72
- Reagent cost	US\$/t ore	2.82	2.82
- Consumables	US\$/t ore	2.72	2.72
- Maintenance spares	US\$/t ore	0.42	0.42
- Power costs	US\$/t ore	4.06	4.06
- Equipment fuel	US\$/t ore	0.76	0.76
Total processing costs	US\$/t ore	11.50	11.50
Total costs			
Mining	US\$/t ore	6.53	7.44
Ore transport to process plant	US\$/t ore	*1.58	*1.58
Processing cost	US\$/t ore	11.50	11.50
Tailings	US\$/t ore	0.16	0.16
Concentrate transport to Ulak	US\$/t ore	1.50	1.50
General & Administrative	US\$/t ore	1.98	1.98
Total cost	US\$/t ore	23.25	24.16

Source: Amur Minerals, Edison Investment Research. Note: *From Maly Kurumkon-Flangovy.

These open-pit costs compare to a similar assessment conducted by Amur in Q115, which calculated an open-pit cost per ore tonne of US\$20.49 and an underground cost of US\$26.37/t – albeit this was based on an assumed room and pillar mining technique, whereas RPM's assessment assumed a long-hole open stoping (LHOS) technique. Costs were estimated to a $\pm 25\%$ level of accuracy and translate into an average cost of US\$1.78/lb Ni in concentrate delivered to Ulak and a cut-off grade (at a nickel price of US\$4.00/lb, or US\$8,820/t vs a spot price of US\$6.00/lb, or US\$13,230/t at the time of writing) of 0.29-0.39% (ie less than the cut-off grade used in the mineral resource estimate in Exhibit 4). Finally, the calculated costs imply an incremental stripping ratio boundary of 3.6x between open-pit and underground mining – ie the respective operating costs of open-pit and underground mining favour underground mining at an incremental stripping ratio above 3.6x.

The ore haulage cost estimate of US\$1.58/t from the mine to the process plant is based on ore mined at Maly Kurumkon-Flangovy and equates to US\$0.15/km. At this rate, the cost from Kubuk to the process plant would be US\$2.33/t, from Vodorazdelny it would be US\$2.21/t and from Ikenskoe it would be US\$1.68/t. In making its estimate, RPM noted that ore haulage costs could be substantially reduced by reconfiguring the system to use off-road mine haulage trucks to dump the ore into stockpiles at the pit berms and/or underground portals and then to use smaller, faster and lower operating cost trucks to transport the ore to the mill (as opposed to using the in-pit mining fleet for the entire route).

Note that RPM's review was based on a toll smelting conception of the development of Kun-Manie. Hence, there was no consideration of smelter terms, recoveries, charges, payable terms and royalties etc, which will be conducted once detailed schedules of grade and tonnage are known thereby allowing a determination of the final metal content of the concentrate.

2017 field season

Amur's 2017 field season was originally conceived as a 15,000m drill programme starting on 1 June, but with sufficient supplies to drill an additional 5,000m should time and weather permit, targeting a four kilometre long segment of the 16km Kurumkon Trend. In the event, mild weather allowed the company to commence drilling approximately four weeks ahead of schedule, on 5 May.

Of the two company owned rigs, the LF70 was assigned to the Ikenskoe deposit and the LF90 to the Kubuk deposit. From the outset, the twin aims of the programme were the conversion of 15.6Mt of inferred resources into the indicated category and resource expansion at Ikenskoe and Kubuk.

As in the 2016 field season, an early start date coupled with a high rate of progress in the form of a high drill rate averaging c 135m per day resulted in the drill programme progressing ahead of schedule. As a result, 26,485.6m of drilling was completed during the year (32% ahead of target) within 107 holes (average 248m/hole) at a record low cost of US\$34.83/m (direct drilling plus indirect processing) – implying a total cost of the programme of US\$0.9m. Key results were as follows:

- A total of 74 holes (69% of the total) intersected ore grade mineralisation no less than 3.0m in width in excess of 0.4% nickel; the average mineralised thickness per hole was 22.4m containing a length-weighted, undiluted grade of 0.80% Ni and 0.25% copper (ie above the averages of the pre-existing, February 2017 mineral resource estimate).
- Step out drilling of 13 holes identified 650m of additional new mineralisation immediately to the southeast of the Ikenskoe deposit, approximately doubling its strike length. Drill grades for the new mineralisation were reported to be substantially higher (eg up to 0.98% nickel) than those reflected in the February 2017 mineral resource estimate, while nine holes intersected ore with an average thickness of 33.1m (ie almost triple the thickness of the mineralisation defined in the February 2017 mineral resource estimate). As a result, Amur declared a JORC-defined exploration target in the area of 10-15Mt at a grade of 0.9-1.0% nickel, cf 21.1Mt at 0.69% Ni as at February 2017. Note that, at this grade, the delivered cost of nickel in concentrate to Ulak could be as low as US\$1.30/lb (cf US\$1.78/lb, above) and could therefore precipitate a significant shift in the anticipated production schedule at Kun-Manie to advance and accelerate production from this area.
- The Kubuk deposit was similarly extended westwards by approximately 600m, again approximately doubling the size of the deposit, with grades in the order of 0.75% nickel and thicknesses in the order to 19.8m. Note that mineralisation to the east of Kubuk also remains open, at material grades (eg 1.02% nickel), albeit declining widths (eg 3.8m).
- The majority of the drilling in the 2017 field season (c 18,500m, or 70% of the total) was conducted along 2.4km of the 3.0km geochemical and geophysical anomaly between the Ikenskoe and Kubuk deposits, denoted the ISK zone (see Exhibit 3). In addition to the March 2018 resource upgrade (see Exhibit 16, below), the FY17 drill results confirmed that there is potential for contiguous mineralisation along the entire trend between the two, with the largest continuous thickness of mineralisation in a single hole at Kun-Manie being recorded (namely 76.4m at an average grade of 0.93% nickel and 0.20% copper), such that the whole could comprise a single c 4.5km long deposit. Drilling in this area has recorded an average mineralised interval of 22.9m at grades of 0.80% nickel and 0.30% copper. As a result, the whole area from Ikenskoe to Kubuk is interpreted to contain three large mineralised blocks, separated by two fault zones. Additional prospective exploration ground also exists to the north of this area in the form of a drill hole (completed in 2005) that intersected 11.6m of mineralisation at a grade of 1.28% nickel.

Overall therefore, the FY17 exploration programme expanded the known mineralised strike length within the 4km trend between Ikenskoe-Sobolevsky and Kubuk by an additional 2,250m to a total of 3,650m. A summary of the increase in the strike length of the mineralisation for the three blocks is as follows:

Exhibit 15: FY17 field season extension of mineralised strike length, by zone

Area	Original length (m)	New length (m)	Increase (m)	Increase (%)
IKEN	600	1,250	+650	+108.3
ISK	0	1,000	+1,000	N/A
KUB	800	1,400	+600	+75.0
Total	1,400	3,650	+2,250	+160.7

Source: Amur Minerals, Edison Investment Research

As a result of the work completed in the 2017 field season, on 20 March 2018, Amur announced an updated mineral resource estimate, as compiled by consultants RPM. As with the previous estimate, dating from February 2017, the resource was calculated at a cut-off grade of 0.4% nickel, such that sub-economic mineralisation is no longer included in the global resource inventory. A comparison between the March 2018 mineral resource estimate and that of February 2017 is as follows:


Exhibit 16: Kun-Manie mineral resource estimate, March 2018 vs February 2017 (0.4% cut-off grade, excluding Gorny)

	March 2018 mineral resource estimate											Change vs February 2017 mineral resource estimate (units)*											
Orebody	Tonnage (Mt)	Ni (%)	Ni (t)	Cu (%)	Cu (t)	Co (%)	Co (t)	Pt (g/t)	Pt (t)	Pd (g/t)	Pd (t)		Tonnage (Mt)	Ni (%)	Ni (t)	Cu (%)	Cu (t)	Co (%)	Co (t)	Pt (g/t)	Pt (t)	Pd (g/t)	Pd (t)
Kubuk																							
Measured	0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Indicated	32.9	0.69	226,000	0.19	63,000	0.014	4,700	0.13	4.3	0.12	3.9		29.3	-0.18	194,680	-0.02	55,440	-0.002	4,124	-0.05	3.6	-0.07	3.3
Total M&I	32.9	0.69	226,000	0.19	63,000	0.014	4,700	0.13	4.3	0.12	3.9		29.3	-0.18	194,680	-0.02	55,440	-0.002	4,124	-0.05	3.6	-0.07	3.3
Inferred	4.7	0.70	33,000	0.19	9,000	0.014	700	0.12	0.6	0.12	0.6		-6.2	-0.04	-47,660	-0.01	-12,800	-0.001	-935	-0.04	-1.2	-0.02	-1.0
Total	37.6	0.69	257,990	0.19	72,490	0.014	5,394	0.13	4.9	0.12	4.5		23.1	-0.09	146,010	-0.01	43,130	-0.001	3,183	-0.03	2.5	-0.03	2.3
Ikenskoe																							
Measured	10.6	0.71	75,000	0.18	19,000	0.011	1,100	0.22	2.3	0.26	2.8		0.5	0.05	8,340	0.00	820	0.000	-11	0.01	0.2	0.01	0.2
Indicated	13.6	0.66	89,000	0.17	24,000	0.012	1,700	0.18	2.4	0.20	2.8		7.3	0.05	50,570	0.03	15,180	0.001	1,007	-0.02	1.2	-0.05	1.2
Total M&I	24.2	0.68	164,000	0.18	43,000	0.012	2,800	0.18	4.7	0.23	5.6		7.8	0.04	58,910	0.01	16,000	0.001	996	-0.02	1.3	-0.02	1.5
Inferred	27.8	0.80	222,000	0.23	63,000	0.017	4,600	0.19	5.2	0.19	5.3		23.1	-0.04	182,520	0.03	53,600	0.001	3,848	0.00	4.3	-0.04	4.2
Total	51.9	0.75	386,000	0.20	106,000	0.014	7,500	0.19	9.9	0.21	10.8		30.8	0.07	241,430	0.03	69,600	0.002	4,944	-0.01	5.6	-0.04	5.6
Vodorazdelny																							
Measured	0.6	0.74	5,000	0.22	1,000	0.012	100	0.29	0.2	0.32	0.2		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Indicated	3.2	0.85	27,000	0.21	7,000	0.017	500	0.16	0.5	0.16	0.5		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Total M&I	3.8	0.85	32,000	0.21	8,000	0.016	600	0.20	0.7	0.19	0.7		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Inferred	1.0	0.81	8,000	0.22	2,000	0.016	200	0.17	0.2	0.16	0.2		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Total	4.8	0.83	40,000	0.21	10,000	0.017	800	0.18	0.9	0.18	0.9		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Maly Kurumkon																							
Measured	0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Indicated	57.5	0.77	445,000	0.22	124,000	0.015	8,900	0.15	8.8	0.16	9.3		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Total M&I	57.5	0.77	445,000	0.22	124,000	0.015	8,900	0.15	8.8	0.16	9.3		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Inferred	3.4	0.80	27,000	0.22	7,000	0.017	600	0.16	0.5	0.15	0.5		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Total	60.9	0.78	472,000	0.22	131,000	0.015	9,500	0.15	9.3	0.16	9.8		0.0	0.00	0	0.00	0	0.000	0	0.00	0.0	0.00	0.0
Total measured	11.2	0.71	80,000	0.18	20,000	0.012	1,300	0.23	2.5	0.27	3.0		0.5	0.05	8,900	0.00	500	0.001	117	0.02	0.2	0.02	0.3
Total indicated	107.0	0.74	787,000	0.20	217,000	0.015	16,200	0.15	16.0	0.15	16.6		36.4	-0.03	247,300	-0.01	67,400	0.000	5,762	-0.01	4.9	-0.01	4.6
Total M&I	118.2	0.73	867,000	0.20	237,000	0.016	17,500	0.16	18.5	0.17	19.6		36.9	-0.02	256,200	-0.01	67,900	0.002	5,879	-0.01	5.1	-0.01	4.9
Total inferred	37.0	0.79	290,000	0.22	81,000	0.017	6,000	0.17	6.4	0.18	6.6		17.0	0.02	134,560	0.01	40,120	0.002	2,875	0.00	3.0	0.01	3.3
Grand total	155.1	0.75	1,157,000	0.21	319,000	0.015	23,500	0.16	24.9	0.17	26.0		53.8	-0.01	390,760	0.00	109,020	0.001	8,754	0.00	8.2	-0.01	8.1

Source: Amur Minerals, Edison Investment Research. Note: *Totals compare to February 2017 mineral resource estimate; M&I = Measured and Indicated. Totals may not add up owing to rounding.

On the basis of our US\$0.9m cost estimate above, we therefore calculate Amur's incremental discovery cost of resources to have been US\$2.36 per tonne of contained nickel in FY17 (cf Amur's current resource multiple of US\$29.41/t – see page 6). Note that no resource was estimated at Gorny (similar to February 2017, but in contrast to earlier estimates), on account of its being a relatively small deposit and the only one with an average grade below the 0.4% cut-off grade at the time of the H116 mineral resource estimate. As a result, Gorny has been excluded from the above table, although future drilling could result in its re-inclusion once again, at a later date. Otherwise, the following are noteworthy features of the upgrade:

- The 51.6% increase in aggregate tonnage in the indicated category (primarily attributable to an 813.9% increase in tonnage in the indicated category at Kubuk).
- The 85.0% increase in aggregate tonnage in the inferred category (primarily attributable to a 491.5% increase in tonnage in the inferred category at Izenskoe).
- The 0.05 percentage point increase in grade in the measured category (attributable to Izenskoe).

Substantial exploration potential remains untested within the Kun-Manie production licence area. However, now that it is the largest undeveloped nickel sulphide deposit in the Far East, drilling for additional resource expansion is no longer deemed to be a strategic imperative for Amur. As a result, drilling in the 2018 field season will focus on metallurgical drill sample collection to support relevant metallurgical test-work designed to allow the company to refine its process flowsheet in order to:

- identify the requirements necessary to generate a nickel sulphate product for direct sale to the electric vehicle battery market; and
- establish the possibility of generating a separate copper concentrate (which could potentially allow Amur to enter into a streaming deal to part fund its initial capex requirements).

Technical and commercial acuity

Throughout the course of the 2017 field season, Amur has made extensive use of its onsite sample preparation facility in tandem with its two handheld Niton XL2 X-Ray fluorescence spectrometers (RFAs). To ensure the accuracy of RFA spectral analysis, the two units are calibrated against existing standards and previously derived Alex Stewart Laboratory (ASL) results. In addition, for QA/QC (Quality Assurance/Quality Control) purposes, Amur's geological team inserts blind blanks and blind duplicates of samples from within each drill hole and samples from which previously derived ASL results are known. The results from these samples are then monitored by the geological team in order to ensure that the analytical team are generating results to within an acceptable level of accuracy and to trigger an immediate re-assay procedure in the event that results are anomalous. This procedure allows Amur to report grades to the market far in advance of the certified analytical results. In addition, it allows Amur to adjust its drilling programme in a timely fashion to reduce the number of barren holes on the periphery of the ore bodies as well as reducing the number of samples sent away for formal ASL analysis and the number of waste samples in the hanging wall – thereby, incidentally, also improving the turnaround time of samples that do require formal assay and the associated costs as, otherwise, a far greater weight per sample would need to be shipped to ASL. Compared to the average US\$8.83 that it costs to process and assay each sample using its on-site sample preparation facility in conjunction with its two RFAs, without them, Amur estimates that it would otherwise cost c US\$40 per sample. Note that the RFA generated results have demonstrated only very small variations (eg 0.02% Ni and 0.01% Cu) from the certified and independent results.

Implications

Amur's continuing focus on the higher-grade domains within the ore body in conjunction with the results of the RPM mining trade-off study, in particular, are changing management's perception of the likely mining outcome at Kun-Manie, with an increasing focus on underground operations. Whereas today's announcement by Amur updates the underground mining potential at Maly Kurumkon-Flangovy based on the February 2017 resource model, the following analysis seeks to provide a valuation based on earlier and more extensive development of underground operations at Kun-Manie generally.

Capex

In addition to the mine plan, capex estimates relating to the project are continuing to evolve. Amur has recently completed a survey of the terrain to be covered by the proposed access road to site, for example, including identifying sources of gravel and bridge locations. Notable developments in this respect are reported to be that it may be possible to utilise existing (albeit primitive) logging roads for part of the distance. In addition, initial indications are that the average cost of the road is likely to be in the order of US\$400,000 per kilometre in mountainous regions and c US\$150,000 per kilometre in other areas – both of which are substantially less than the company's originally budgeted US\$1m per kilometre (see Exhibit 11). Although the precise savings cannot be established in the absence of specific and detailed road design, Amur does nevertheless anticipate a substantial reduction in this capital cost category with a significant portion of the decrease being attributable to the c 50% devaluation of the Russian rouble since the compilation of the original estimate. Note that Amur has recently compiled detailed topographic maps along the entire planned route for use in the commissioning of a desktop study to develop more accurate costings in respect of the road's construction.

Revised capex estimates

As a result of the above considerations, our updated capex estimates for the four development scenarios at Kun-Manie are as follows (note that these may be compared with the equivalent capex estimates made in 2015, depicted in Exhibit 11). Note that 'Underground fixed' and 'Underground development' will not be implemented during the initial capex stage, but instead after operational start-up has been achieved, with the open pit being the original source of production. As a result, these items have been included in 'sustaining', rather than 'initial', capex in the table below:

Exhibit 17: Kun-Manie capex estimates (US\$m)

	Toll smelting		Low-grade matte		High-grade matte		Refinery	
	Initial	Sustaining	Initial	Sustaining	Initial	Sustaining	Initial	Sustaining
Infrastructure & permanent facilities								
Studies	5	0	5	0	5	0	5	0
320km access road	160	4	160	4	160	4	160	4
Power	112	1	112	1	112	1	112	1
Site facilities	10	0	10	0	10	0	10	0
EPCM (road, power facilities)	22	0	25	3	25	11	27	8
Underground fixed	0	32	0	32	0	32	0	32
Underground development	0	323	0	323	0	323	0	323
Processing	116	1	116	1	116	1	116	1
Tailings	13	6	13	6	13	6	13	6
Gorny infrastructure	22	0	0	0	0	0	0	0
Electric furnace smelter	0	0	115	5	115	5	115	5
Converter smelter	0	0	0	0	157	3	157	3
Refinery	0	0	0	0	0	0	210	3
Smelter infrastructure	0	0	22	0	22	0	22	0
Haul roads	6	0	6	0	6	0	6	0
Ikenskoe diversion	0	0	0	0	0	0	0	0
Total fixed assets	466	367	584	375	741	386	953	386
Mobile equipment								
Transportation fleet	6	28	6	28	6	28	6	28
Mining fleet	70	181	70	181	70	181	70	181
Total mobile	76	209	76	209	76	209	76	209
Grand total	542	576	660	584	817	595	1,029	595
Change vs previous (see Exhibit 11)	-160	+329	-191	+337	-224	+346	-352	+120

Source: Amur Minerals, 2017. Note: Totals may not add up owing to rounding.

Note that in each scenario, the increase in capex is less than the increase implied by the inclusion of underground capex for the first time (included in the lines 'Underground fixed' and 'Underground development'), indicating that underlying capex estimates have, in fact, declined.

Nickel and its application in batteries

There are approximately seven important types of lithium-ion battery; nickel is an important component in three (highlighted):

- **NCA** – Lithium nickel cobalt aluminium oxide (LiNiCoAlO₂)
- **NMC** (NCM) – Lithium nickel cobalt manganese oxide (LiNiCoMnO₂)
- **LNMO** – Lithium nickel manganese spinel (LiNi_{0.5}Mn_{1.5}O₄)
- LFP – Lithium iron phosphate (LiFePO₄)
- LMO – Lithium manganese oxide (LiMn₂O₄)
- LCO – Lithium cobalt oxide (LiCoO₂)
- LTO – Lithium titanium oxide (Li₄Ti₅O₁₂)

Unlike the consumer electronics market, which typically favours high-cobalt LCO batteries, the car manufacturing industry increasingly favours nickel-rich NMC and NCA batteries, owing to their relative cheapness to manufacture. Tesla's electric vehicles, for example, use an NCA chemistry that requires a cathode that is 80% nickel. As a result, Porsche, among others, expects the ratio of nickel to cobalt and manganese in a typical battery to rise eightfold as electric cars evolve.

Estimates of the future uptake of electric vehicles vary widely, from approximately 14m in 2025 at the more conservative end of the spectrum, to c 70m at the upper end. That represents a relatively small (c 1.1-5.5%) penetration of the total stock of vehicles of c 1.3bn globally. Nevertheless, as Glencore's CEO Ivan Glasenberg observed recently, "a shift of just 10 per cent of the global car fleet to electric vehicles would create demand for 400,000t of nickel, in a 2Mt market."

In addition, nickel for batteries is typically consumed in the form of nickel sulphate, which is a premium grade salt that is itself typically synthesised from pure nickel metal and produced by a select few producers only. As a result, nickel production in the form of nickel pig iron or ferronickel will not be available as a source of ready supply to battery manufacturers, leading to a likely bifurcation of the market.

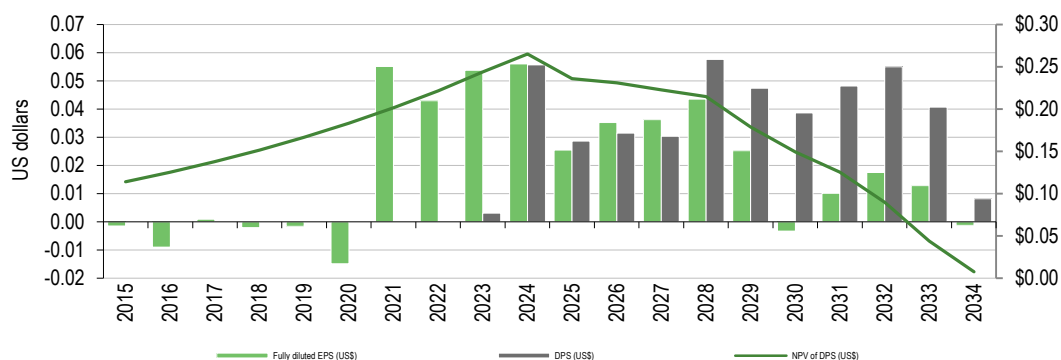
Valuation – five development options

In addition to the above considerations, a summary of Edison's other principal operating assumptions in valuing Amur is as follows:

Exhibit 18: Additional valuation assumptions summary		
Parameter	Assumption	Prior assumption*
Timing	Equity fund-raising in FY18; development in FY18-20; production in FY21.	Equity fund-raising in FY17; development in FY17-19; production in FY20.
Long-term nickel price	US\$7.50/lb (US\$16,538/t).	US\$10.14/lb (US\$22,355/t) – derived from long-term oil correlation.
Long-term copper price	US\$2.96/lb (US\$6,527/t).	US\$2.75/lb (US\$6,064/t).
Stripping ratio	2.48 in years 1-4, 3.73 in years 10-13; average 2.26; underground operation in years 6-8.	2.5 in years 0-8; underground operation in years 9-15.
Mean life-of-mine nickel grade (%)	0.70%	0.57%
Average MgO content in ore (%)	15.08%	14.95%
Average MgO content in concentrate (%)	10.2%	7.4-10.8%
MgO penalty	US\$8.00/t for every percentage point above 4% in concentrate.	US\$8.00/t for every percentage point above 4% in concentrate.
Mass pull (ratio of concentrate to ore)	6.0%	7.0%
Moisture	7.0%	8.0%
Ni grade of concentrate (%)	9.26%	6.53%
G&A expenses	US\$3.8m per annum	US\$2.4m per annum
Taxation	0% in years 1-5; 10% in years 6-10, 20% thereafter.	0% until year 6 of production; 10% for further five years, then 20% thereafter.
Source: Edison Investment Research. Note: *See Edison's initiation note, In from the cold , published on 22 July 2015.		

Finally, we have assumed that Amur raises sufficient equity at the currently prevailing share price so that its financial leverage ratio (debt/[debt+equity]) does not exceed 80% at its maximum extent.

For the toll smelting option, the stream of dividends that results from this proposed development of Kun-Manie averages 3.7 US cents per share pa and potentially reaches 5.8c/share (fully diluted). When discounted at a rate of 10% pa, the net present value of this dividend stream to investors is US\$0.15 per share in FY18, rising to US\$0.27 in FY24, by which time we estimate that debt will have been repaid and a first dividend could theoretically be paid to shareholders.

Exhibit 19: Amur Minerals forecast EPS and (maximum potential) DPS, FY15-34e


Source: Edison Investment Research

Directly comparable results for each of the four development options, expressed relative to varying discount rates, are shown in Exhibit 20 below. In addition, there is one further option considered, whereby the project is developed, initially, as a toll smelting operation for two years, which is then developed further, into a low-grade matte operation for one year, a high-grade matte operation for an additional year and then, finally, into a fully integrated nickel refining operation thereafter. This final option is denoted the 'combined' scenario.

Exhibit 20: AMC equity valuations by development scenario and discount rate (US cents per share)

US cents per share (post-dilution)	0%	5%	10% (base case)	15%	20%	25%	30%
Toll smelting – US\$138.1m in equity fund-raising required							
	44	25	15	9	6	4	3
Low-grade matte – US\$148.4m in equity fund-raising required							
	75	44	27	17	11	8	6
High-grade matte – US\$148.4m in equity fund-raising required							
	74	43	26	16	10	7	5
Refinery – US\$149.3m in equity fund-raising required							
	125	75	46	30	20	14	10
Combined – US\$149.3m in equity fund-raising required							
	85	46	26	16	9	6	4

Source: Edison Investment Research

Investors' attention is drawn to the similarity between the valuations for the low-grade matte, high-grade matte and combined development option scenarios. For an additional US\$126m in capex (see Exhibit 17), or US\$10.3m in equity funding, investors are able to approximately double the value of their investment (from 15c/share to 27c/share) by upgrading the scope of the operation from simple concentrate production for toll smelting to low-grade matte production. Little additional value is added by upgrading operations further to high-grade matte production or via incremental development to a fully integrated refinery over five years (the 'combined' scenario) at our current commodity price assumptions (see also Exhibits 26-30). However, for only a further US\$380m in capex, or US\$0.9m in equity funding, initially, investors are approximately able to double the value of their investment once again (from 27c/share to 46c/share) by instead opting to build a fully integrated refining operation from the outset and to thereby maximise the value presented by the project to the company.

Sensitivities

A key factor in determining our ultimate valuation for Amur is the degree of future equity funding. For the purposes of our modelling, equity funding is presumed to occur at Amur's prevailing share

price (ie 4.40p at the time of writing). As stated previously, our base case scenario assumes 80% financial leverage. However, the sensitivity of the valuation of the five development options to variances in this funding mix is provided in the five tables below, from zero equity raised (ie debt funding alone) with the associated maximum leverage ratio shown to 70% leverage (defined as net debt/[net debt+equity]):

Exhibit 21: Amur Minerals' toll smelt option valuation sensitivity to degree of future equity dilution

Maximum leverage ratio*	108.9%	90%	80%	70%
Required equity funding (US\$m)	0.0	89.9	138.1	186.3
Valuation (US cents per share)	45	18	15	13

Source: Edison Investment Research. Note: *Defined as (net debt/[net debt+equity]).

Exhibit 22: Amur Minerals' low-grade matte option valuation sensitivity to degree of future equity dilution

Maximum leverage ratio*	108.0%	90%	80%	70%
Required equity funding (US\$m)	0.0	95.1	148.4	201.8
Valuation (US cents per share)	105	35	27	22

Source: Edison Investment Research. Note: *Defined as (net debt/[net debt+equity]).

Exhibit 23: Amur Minerals' high-grade matte option valuation sensitivity to degree of future equity dilution

Maximum leverage ratio*	108.0%	90%	80%	70%
Required equity funding (US\$m)	0.0	95.1	148.4	201.8
Valuation (US cents per share)	98	33	26	21

Source: Edison Investment Research. Note: *Defined as (net debt/[net debt+equity]).

Exhibit 24: Amur Minerals' refinery option valuation sensitivity to degree of future equity dilution

Maximum leverage ratio*	108.0%	90%	80%	70%
Required equity funding (US\$m)	0.0	95.7	149.3	202.9
Valuation (US cents per share)	200	63	46	38

Source: Edison Investment Research. Note: *Defined as (net debt/[net debt+equity]).

Exhibit 25: Amur Minerals' combined development option valuation sensitivity to degree of future equity dilution

Maximum leverage ratio*	108.0%	90%	80%	70%
Required equity funding (US\$m)	0.0	95.7	149.3	202.9
Valuation (US cents per share)	99	34	26	22

Source: Edison Investment Research. Note: *Defined as (net debt/[net debt+equity]).

We assume that investors are aware that there are certain risks inherent in investing in Russia at the current time, including the issue of sanctions, which could, among other things, complicate the import of capital goods. Technical risks include geological, engineering, metallurgical and logistical risks (including the distance of the project from ports and rail infrastructure). In terms of its development, the project is effectively at the preliminary economic assessment (PEA) stage of development, although upgrading it to pre-feasibility standard should be a relatively simple matter. In due course, it will nevertheless need to be upgraded to bankable status (either western or Russian).

In quantitative terms, a summary of the sensitivity of the five development options to metals prices is shown below (note that the nickel price at the time of writing is US\$6.00/lb, or US\$13,230/t):

Exhibit 26: Amur Minerals' toll smelt option valuation sensitivity to nickel price

Nickel price (US\$/lb)	6.17	7.50	8.25	10.14
Nickel price (US\$/t)	13,605	16,538	18,191	22,355
Valuation (US cents per share)	1	15	22	40

Source: Edison Investment Research.

Exhibit 27: Amur Minerals' low-grade matte option valuation sensitivity to nickel price

Nickel price (US\$/lb)	4.69	7.50	8.25	10.14
Nickel price (US\$/t)	10,341	16,538	18,191	22,355
Valuation (US cents per share)	1	27	34	50

Source: Edison Investment Research.

Exhibit 28: Amur Minerals' high-grade matte option valuation sensitivity to nickel price

Nickel price (US\$/lb)	4.91	7.50	8.25	10.14
Nickel price (US\$/t)	10,827	16,538	18,191	22,355
Valuation (US cents per share)	1	26	32	49

Source: Edison Investment Research.

Exhibit 29: Amur Minerals' refinery option valuation sensitivity to nickel price

Nickel price (US\$/lb)	3.72	7.50	8.25	10.14
Nickel price (US\$/t)	8,203	16,538	18,191	22,355
Valuation (US cents per share)	1	46	55	76

Source: Edison Investment Research.

Exhibit 30: Amur Minerals' combined option valuation sensitivity to nickel price

Nickel price (US\$/lb)	5.26	7.50	8.25	10.14
Nickel price (US\$/t)	11,598	16,538	18,191	22,355
Valuation (US cents per share)	1	26	34	53

Source: Edison Investment Research.

By contrast, Amur's valuation sensitivity relative to costs is as follows:

Exhibit 31: Amur valuation sensitivity relative to operating costs, by development option scenario (US cents per share)

Valuation (US cents per share)	Operating costs				
	-20%	-10%	Base case	+10%	+20%
Toll smelt option	20	18	15	13	10
Low-grade matte option	31	29	27	25	23
High-grade matte option	30	28	26	23	21
Refinery option	52	49	46	44	41
Combined option	32	29	26	24	21

Source: Edison Investment Research

As such, it can be seen that a 10% change in the nickel price results in a c 7-9c change in valuation, whereas a 10% change in costs results in a 2-3c change in valuation, almost irrespective of the development option adopted.

Financials

Amur had US\$5.4m of net cash as at 30 June 2017 after US\$2.8m of cash outflows over the course of the first six months of the year. We estimate a further US\$1.3m of cash outflows in H217, resulting in US\$4.1m of net cash as at 31 December 2017 – sufficient for almost one more field season plus associated studies prior to development financing and capital expenditure towards the end of FY18. Note that all equity funding arrangements with financiers such as Lanstead and Crede have now been concluded and/or terminated.

Exhibit 32: Financial summary

	US\$'000s	2010	2011	2012	2013	2014	2015	2016	2017e	2018e
Year end 31 December	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS										
Revenue	0	0	0	0	0	0	0	0	0	0
Cost of Sales	0	0	0	0	0	0	0	0	0	0
Gross Profit	0	0	0	0	0	0	0	0	0	0
EBITDA	(1,928)	(2,892)	(1,750)	(2,539)	(2,358)	(4,114)	(3,768)	(1,892)	(3,768)	(3,768)
Operating Profit (before GW and except.)	(1,928)	(2,892)	(1,750)	(2,539)	(2,358)	(4,114)	(3,768)	(1,892)	(3,768)	(3,768)
Intangible Amortisation	0	0	0	0	0	0	0	0	0	0
Exceptionals	(328)	(1,505)	(435)	(151)	1,158	1,184	(2,007)	2,334	0	0
Other	0	0	0	0	0	0	0	0	0	0
Operating Profit	(2,256)	(4,397)	(2,185)	(2,690)	(1,200)	(2,930)	(5,775)	442	(3,768)	(3,768)
Net Interest	0	(211)	(1,813)	(1,141)	(161)	2,224	4	123	61	61
Other	0	0	0	0	0	0	0	0	0	0
Profit Before Tax (norm)	(1,928)	(3,103)	(3,563)	(3,680)	(2,519)	(1,890)	(3,764)	(1,769)	(3,707)	(3,707)
Profit Before Tax (FRS 3)	(2,256)	(4,608)	(3,998)	(3,831)	(1,361)	(706)	(5,771)	565	(3,707)	(3,707)
Tax	0	0	0	0	0	0	0	0	0	0
Profit After Tax (norm)	(1,928)	(3,103)	(3,563)	(3,680)	(2,519)	(1,890)	(3,764)	(1,769)	(3,707)	(3,707)
Profit After Tax (FRS 3)	(2,256)	(4,608)	(3,998)	(3,831)	(1,361)	(706)	(5,771)	565	(3,707)	(3,707)
Average Number of Shares Outstanding (m)	193.9	271.8	345.1	387.2	431.2	445.7	547.9	614.6	1,750.6	1,750.6
EPS - normalised (c)	(1.0)	(1.1)	(1.0)	(1.0)	(0.6)	(0.4)	(0.7)	(0.3)	(0.2)	(0.2)
EPS - FRS 3 (c)	(1.2)	(1.7)	(1.2)	(1.0)	(0.3)	(0.2)	(1.1)	0.1	(0.2)	(0.2)
Dividend per share (c)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross Margin (%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EBITDA Margin (%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operating Margin (before GW and except.) (%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BALANCE SHEET										
Fixed Assets	14,151	13,903	17,928	18,955	12,035	12,162	19,903	22,381	30,050	30,050
Intangible Assets	13,685	13,503	17,084	18,318	11,783	11,513	17,167	19,129	19,129	19,129
Tangible Assets	466	400	844	637	252	649	2,736	3,252	10,920	10,920
Other receivables	0	0	0	0	0	0	0	0	0	0
Current Assets	7,215	7,386	8,389	11,074	9,090	11,355	9,723	5,581	132,306	132,306
Stocks	167	165	224	269	237	512	756	756	756	756
Trade Debtors	0	0	0	0	0	0	0	0	0	0
Cash	3,066	4,436	2,048	2,392	1,389	9,613	8,199	4,057	130,782	130,782
Other receivables/other	3,982	2,785	6,117	8,413	7,464	1,230	768	768	768	768
Current Liabilities	(109)	(102)	(119)	(123)	(407)	(539)	(416)	(416)	(415)	(415)
Creditors	(109)	(102)	(119)	(123)	(407)	(539)	(416)	(416)	(415)	(415)
Short term borrowings	0	0	0	0	0	0	0	0	0	0
Long Term Liabilities	0	0	0	0	0	(509)	(3,461)	(1,127)	(1,127)	(1,127)
Long term borrowings	0	0	0	0	0	0	0	0	0	0
Other long term liabilities	0	0	0	0	0	(509)	(3,461)	(1,127)	(1,127)	(1,127)
Net Assets	21,257	21,187	26,198	29,906	20,718	22,469	25,749	26,420	160,814	160,814
CASH FLOW										
Operating Cash Flow	(1,201)	(2,761)	(1,071)	(1,556)	(1,960)	(3,090)	(2,210)	(1,892)	(3,768)	(3,768)
Net Interest	0	0	0	0	0	0	4	123	61	61
Tax	0	0	0	0	0	0	0	0	0	0
Capex	(492)	(20)	(3,482)	(2,315)	(748)	(2,751)	(4,533)	(2,478)	(7,668)	(7,668)
Acquisitions/disposals	363	0	0	0	0	0	0	0	0	0
Financing	3,527	4,344	2,165	4,242	1,841	14,407	6,589	58	138,100	138,100
Dividends	0	0	0	0	0	0	0	0	0	0
Net Cash Flow	2,197	1,563	(2,388)	371	(867)	8,566	(150)	(4,190)	126,725	126,725
Opening net debt/(cash)	(997)	(3,066)	(4,436)	(2,048)	(2,392)	(1,389)	(9,613)	(8,199)	(4,057)	(4,057)
HP finance leases initiated	0	0	0	0	0	0	0	0	0	0
Other	(128)	(193)	0	(27)	(136)	(342)	(1,264)	48	0	0
Closing net debt/(cash)	(3,066)	(4,436)	(2,048)	(2,392)	(1,389)	(9,613)	(8,199)	(4,057)	(130,782)	(130,782)

Source: Company sources, Edison Investment Research

Contact details	Revenue by geography
Amur Minerals Corporation, 14 Gaidar Street, Office 9, Khabarovsk 680063, Russia Phone: +7 (4212) 755 615 www.amurminerals.com	N/A
Management team	
CEO: Robin Young	Non-executive chairman: Robert Schafer
Mr Young is a geological engineer who has worked extensively in the CIS since 1991. He has 39 years' experience in the mineral resources industry, including responsibility for large projects in remote areas, as well as the junior sector. He has a BSc in geological engineering and is a licensed professional geologist. He has been CEO of the company since October 2004.	Mr Schafer has 40 years' experience in the mineral industry with both major and junior mining companies, including notable experience in Russia's Far East. He is currently executive VP, business development at Hunter Dickinson. In addition, he is president of the Canadian Institute of Mining & Metallurgy, VP of PDAC and a past president of the Mining & Metallurgical Society of America.
Non-executive director: Ljupco Naumovski	Non-executive director: Paul Gazzard
Mr Naumovski has more than three decades of experience in Russia, most recently as VP and general director of the Moscow office for Kinross. He has also served as senior VP and general manager of Visa International in the CEMEA region, as senior banker and head of mission for the Russian team of the EBRD in Moscow and as commercial secretary for the Canadian Embassy in Moscow and later deputy director for USSR and Eastern Europe for the Canadian Department of External Affairs and International Trade.	Mr Gazzard joins the board after being an external advisor to Amur for many years and with over 10 years' experience as a fund manager in London. Between 2002 and 2010, he participated in the listing of three Australian technology companies on AIM, operating at the senior executive level before taking a position as COO of Litebulb Group overseeing multiple funding rounds and acquisitions over two years. Since then, Paul has worked as a corporate finance consultant as well as an adviser to a number of high net worth individuals on specific corporate and management-related issues.
Principal shareholders	(%)
Interactive Investor Services	26.85%
Hargreaves Lansdown (Nominees)	15.29%
HSDL Nominees Ltd	11.27%
Barclayshare Nominees Ltd	8.81%
HSBC Client Holdings Nominee (UK)	5.40%
Wealth Nominees Ltd	4.02%
Lawshare Nominees Ltd	3.51%
Companies named in this report	
N/A	

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