Lottah Mining Pty Ltd
Hampshire Magnetite Deposit
Resource Estimation

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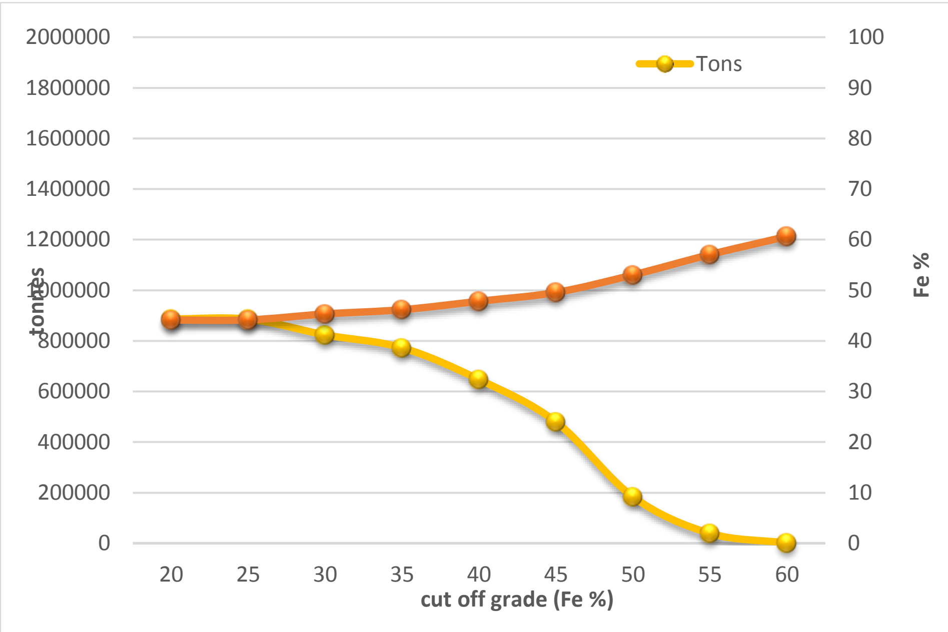
Abstract

Resource

A resource has been estimated for the Hampshire magnetite deposit at Hampshire in Tasmania's northwest. The resource is classified as Inferred based on deficiencies with the data sets used in the estimation.

A total resource of 886,571t @ 44.12% Fe has been estimated.

Cut-off Fe grade (%)	Volume (m3)	Tons	Grade Fe (%)
60	313	1275	60.63
55	9652	39382	57.05
50	45035	183743	53.03
45	117555	479623	49.57
40	158613	647142	47.83
35	189352	772554	46.16
30	201887	823698	45.32
25	212074	885663	44.14
20	217297	886571	44.12



Geology

The Hampshire magnetite deposit is a 4m to 12m true thickness band of massive magnetite skarn hosted within a sequence of skarned sediments from the upper Moina Sandstone.

The body strikes north-south and dips to the west, shallow in the east steepening with depth to the west, in an open antiform shape with the body on the western limb near to the crest. The eastern and northeastern margins outcrop and are eroded, the body remains open to the south and at depth to the west.

The band of magnetite skarn is separated from the granite contact by up to ~50m for much of the deposit becoming closer at depth and in the northern part where it approaches the contact and is apparently pinches out against the granite.

The skarn body appears to maintain its structure regardless of the location of the granite contact and it is most likely that the Hampshire magnetite skarn is preferentially replacing a particular unit in the upper Moina Sandstone.

Data

Two sample data sources were available;

1989 Tasmania Mines Limited open hole percussion drilling programme (HM1 to HM44),

2009 Red River Resources Limited/Iron Mountain Mining Limited face sampling RC drilling programme (BHRC001 to BHRC025).

There has been no QA/QC on this sample data.

No bulk density data was available and a figure of 4.08t/m3, taken from Whitehead (1990) from work on the nearby Kara deposits, was used.

Resource Modelling

The resource was modelled using SURPAC's block modelling function.

A block model with 5m in the X direction, 10m in the Y direction and 2.5m in the Z direction was created. Sub-blocking to 1.25m x 2.5m x 0.625m was permitted.

Estimation was by Inverse Distance Squared. Minimum 3 and maximum 15 samples per block. 6 discretisation points per block. Search ellipse was a 100m x 100m sphere.

Potential to Add to Resource

There is considerable potential to the south along strike where magnetics indicates that magnetic rocks continue.

At depth the body appears to be being truncated by the granite though this needs some confirmation. There is a small area of further potential on the northeastern corner also.

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1.0 Introduction

This report details the estimation of a JORC resource for that portion of the Hampshire magnetite deposit which has been drilled to sufficient density for such an estimation to be made.

The Hampshire magnetite deposit lies approximately 25 kilometres inland from Burnie a few hundred metres to the immediate east of the Emu Bay Railway and Murchison Highway.

The deposit lies wholly on tenement EL 35/2006 “Hampshire 1” held by Blythe River Iron Pty Ltd, a subsidiary of Lottah Mining Pty Ltd who manage work on the tenement.

The land on which the deposit both outcrops and beneath which it underlies is owned by Forico Pty. Ltd., a forestry plantation company, and utilised for forestry operations.

2.0 Project background

2.1 Prospecting, Mining, Exploration History

Iron ore deposits have been known about in the hinterland to Burnie since the late 19th century.

The Hampshire area is apparently first referred to in the 1920's by Reid and Nye (1923), Reid (1924) and Blake (1928) though these references are to magnetite deposits in the general Hampshire Hills area.

The first specific reference to the Hampshire deposit itself is believed to be that of Atkinson (1958) for Rio Tinto Exploration Pty. Limited who refers to Reid (1924) and Henderson (1936), who described the occurrence of such magnetite deposits, as well as the results of BMR aeromagnetic surveys carried out in late 1955/early 1956 which presumably would have defined the location of these magnetite deposits accurately for the first time.

Atkinson (1958) produced the first geological map of the Hampshire deposit.

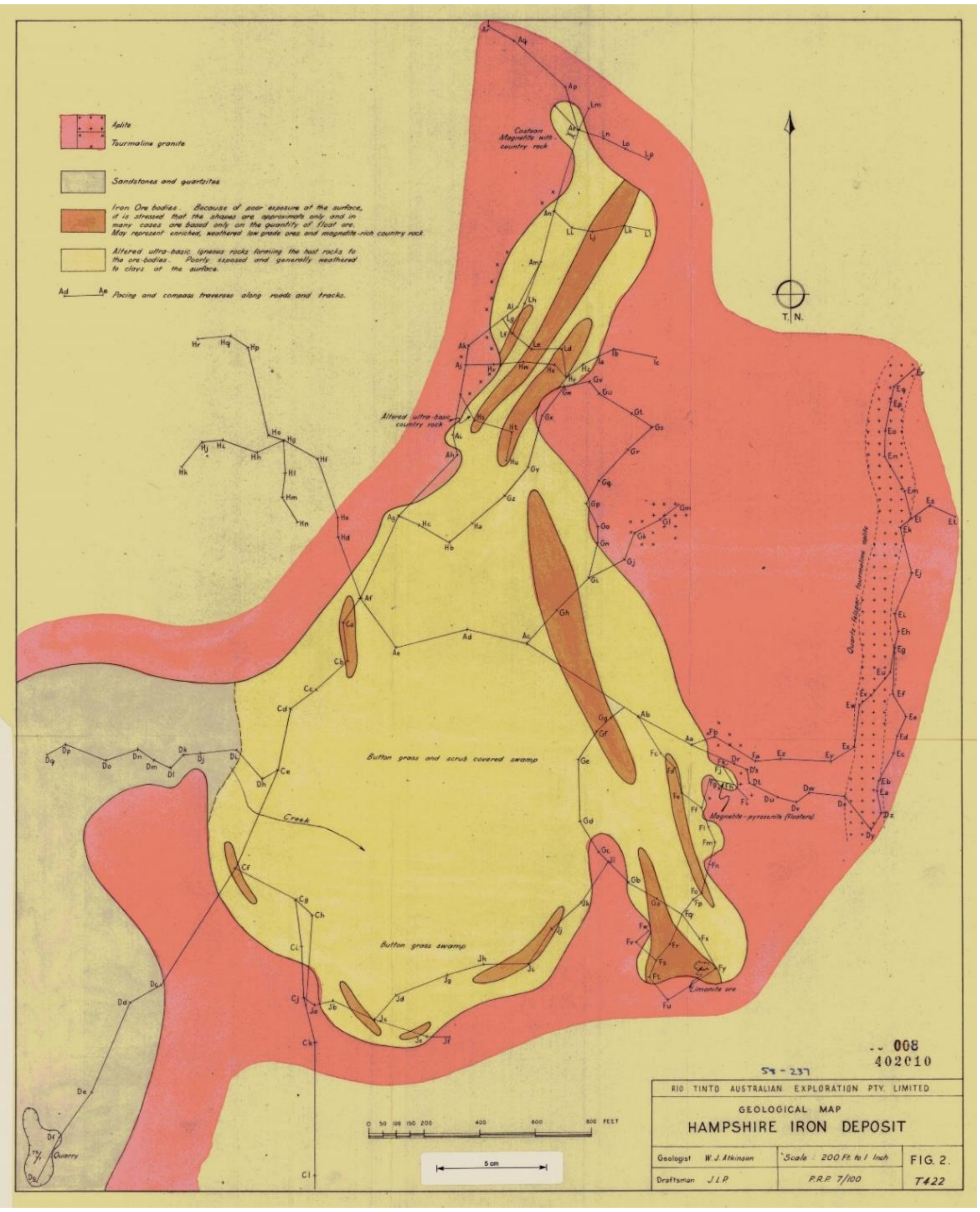

Figure 2.1: Atkinson (1958): Geological plan of the Hampshire prospect.

There does not appear to have been any further work on the deposit until 1972 when an ANZECO/Tasminex N.L. JV reportedly (Whitehead, 1990) “discovered” the deposit when following up anomalous scheelite in a regional pan-concentrate sampling programme.

Between 1972 and 1974 ANZECO/Tasminex gridded the northern part (~150m) of the deposit carrying out geological mapping, soil sampling (for WO3 predominantly) and ground magnetics.

ANZECO/Tasminex also carried out a programme of auger drilling using a GEMCO power auger (Kruger, 1974). 28 holes for a total of 1010’ were drilled with holes assayed for WO3 with 3’ sample intervals. Drill logs describe the presence or otherwise of magnetite.

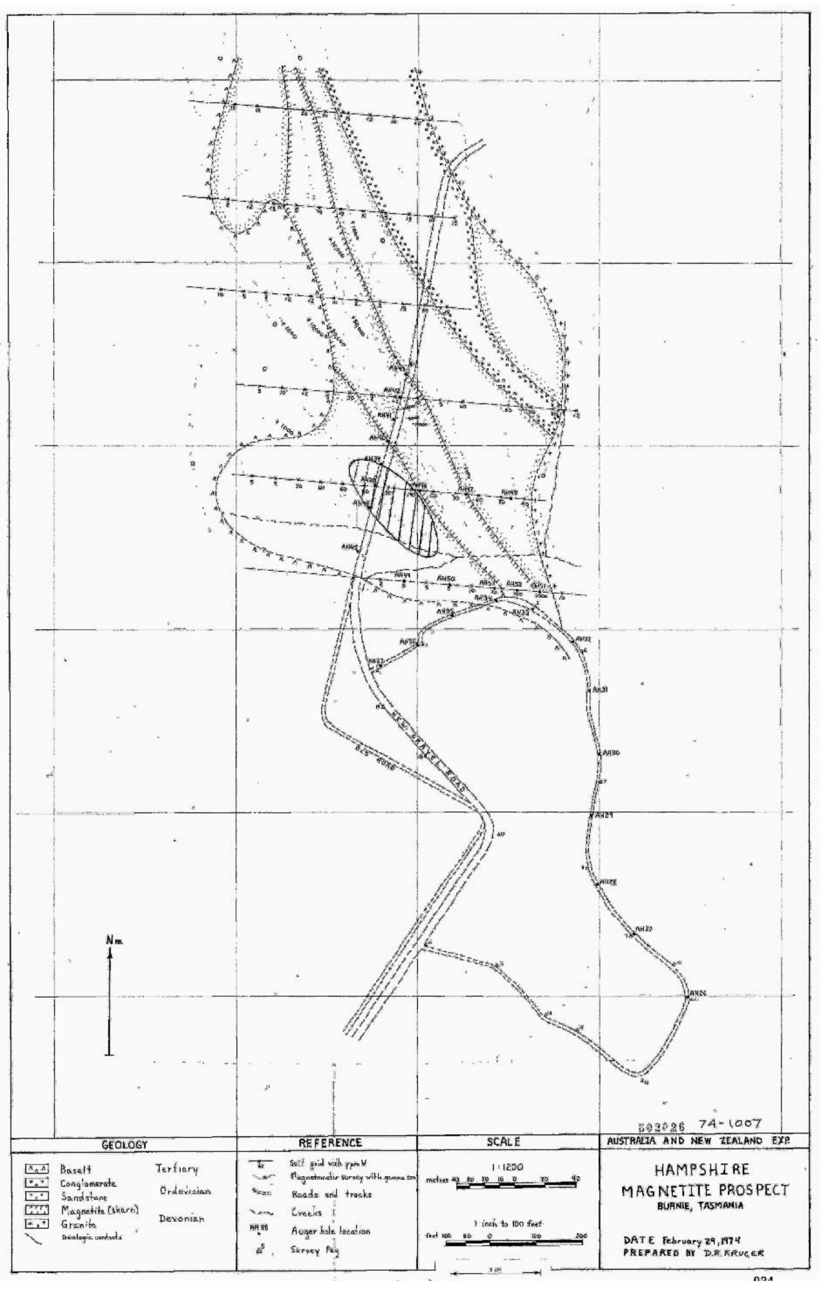

Figure 2.2: Kruger (1974): Geology plan of Hampshire prospect.

In 1983-1985 The McIntyre Mines/Tasminex JV carried out extensive ground magnetics surveys over a large area from L5 prospect through to Hampshire. The magnetics surveys on 25-30m spaced lines indicated that the Hampshire magnetite deposit has a strike length of 480m (Whitehead, 1990).

In May to June 1989 Tasmania Mines Ltd. carried out a programme of percussion drilling on the northern 125m of the magnetic anomaly using the Tasmania Mines Ltd. mine's Tamrok blast hole rig. A total of 58 holes named HM1 to HM44 (with a number of *A holes also drilled) were drilled for a total of 495.5m. Holes were open hole percussion. Sampling and logging was carried out on nominally 3m intervals. Collars were accurately surveyed by certified surveyors.

At the end of this work a resource estimate was calculated for this northern 125m section with the potential extrapolated for the remainder of the 480m strike.

The prospect was included in EL 35/2006 in a JV between Iron Mountain Mining Limited and Red River Resources Limited who carried out a ground magnetic survey over the prospect in 2008/09 and drilled 31 RC holes (using a face sampling bit) for 1537 metres (BHRC001 to BHRC018 and BHRC020 to BHRC032).

2.2 Previous resource estimates

The only previous resource estimate is that made by Whitehead (1990) using the 58 Tamrok open hole percussion drill hole results.

Whitehead (1990), using a polygonal method, calculated that the northernmost 125m of strike of the deposit contained 158,768 tons of ore averaging 52.56% Fe to a depth of 15m. An S.G. of 4.08g/cm3 was used.

Extrapolating this estimation over the full 480m of strike of the defined magnetic anomaly Whitehead inferred that the total resources would be ~500,000 tons per 10m of vertical depth over this area.

Whitehead uses an S.G. of 4.08g/cm3 but does not state how this figure was determined. Given Whiteheads work on the overall Kara series of orebodies it is likely that this number was taken from his experience in this work.

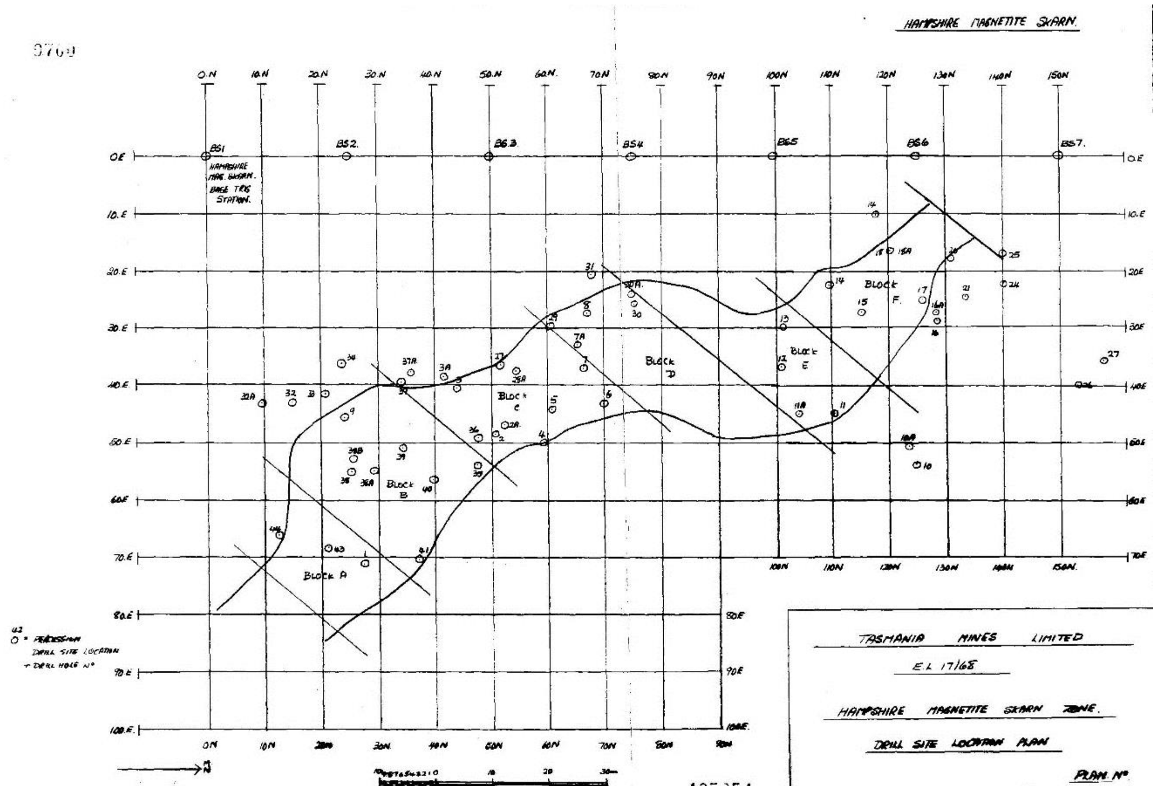

Figure 2.3: 1989 open hole percussion drill hole plan (Whitehead, 1989)

3.0 Geology

3.1 Regional Geology

Regionally the geology of the region is dominated by a basement of Proterozoic metasediments (and minor mafic volcanics) of the Oonah/Burnie Formations unconformably overlain by a sequence of Cambro-Ordovician volcanics and sediments, both intruded by the Devonian Housetop Granite, all generally obscured by a veneer of Tertiary basalt.

The basal unit of the Cambro-Ordovician sequence consists of Mt Read Volcanics, correlated with Tyndall Group. These are overlain by the Owen Group sediments.

The basal member of the Owen Group is a quartz pebble conglomerate with local additions of volcaniclastic detritus. The conglomerates are overlain by the Moina Sandstone which has a gradational contact with the overlying Gordon Group Limestone, becoming more calcareous towards the contact.

The calcareous upper part of the Moina Sandstone and the overlying Gordon Group limestones and dolomites are the host to skarn mineralsation at Kara and Rogetta. Elsewhere carbonates of the Oonah/Burnie Formation also host skarn mineralisation. Buckbys prospect 5km to the north of Hampshire and the Natone prospect 15km's to the northeast are examples of this.

These basement rocks were deformed in the Middle Tabberrabberran Orogeny under a largely east-west compressive stress regime. This resulted in the development of north to north-northeast striking F2 folds superimposed on a much broader east-west F2 fold.

Late in the orogeny the I-type Housetop Granite was emplaced passively and underlies most of the Rogetta Project tenements.

Skarn mineralisation was introduced into calcareous rocks by fluids derived from this granite with rarer vein style mineralisation also associated with this intrusive. Whilst previously considered to be a single body more recent work (McKeown, 1994) suggests that the granite consists of a number of phases often intruding as dykes as opposed to a large rounded batholith geometry.

In the Tertiary topographic lows were filled by basal sediments followed by thick Tertiary basalt flows which spilled over onto more undulating topography as a thin veneer.

The mapped geology of EL 35/2006 shows basalt extending over plus 95% of the area with Proterozoic and Palaeozoic rocks outcropping in a number of small windows.

3.2 Hampshire deposit geology

The Hampshire deposit outcrops in one of these windows through the Tertiary basalt.

The Hampshire magnetite deposit is a 4m to 12m true thickness band of massive magnetite skarn hosted within a sequence of skarned sediments from the upper Moina Sandstone.

The body strikes north-south and dips to the west, shallow in the east steepening with depth to the west, in an open antiform shape with the body on the western limb near to the crest. The eastern and northeastern margins outcrop and are eroded, the body remains open to the south and at depth to the west.

The Moina Sandstone rocks overlying and underlying the magnetite body are also skarned with pyroxene skarn, garnet skarn and epidote skarn assemblages common. Due to the lack of diamond drilling there is no sub-surface structural information regarding the orientation of bedding in these sediments other than that on a regional basis a north-south strike is expected and a moderate west dip reasonable.

The Moina Sandstone rocks overly the Housetop Granite body at depth and to the east.

There is only limited information regarding the position of the granite apart from the northeastern part of the deposit where granite is intersected at shallow depths in BHRC012, 013, 014, 026, 027 and 028.

Granite is also intersected at depth in the southwestern part of the deposit in BHRC030 (sand in adjacent hole BHRC029 is possibly also partly after granite). It is this intersection which is used to model the moderate westerly dip to the granite overall with a shallowing to the north at the northern margin of the deposit.

The band of magnetite skarn is separated from the granite contact by up to ~50m for much of the deposit becoming closer at depth and in the northern part where it approaches the contact and is apparently pinches out against the granite.

The skarn body appears to maintain its structure regardless of the location of the granite contact.

It is most likely that the Hampshire magnetite skarn is preferentially replacing a particular unit in the upper Moina Sandstone. The alternative explanation that its position reflected the granite contact through metasomatic processes is considered less likely.

To the west the skarned sequence is overlain by Tertiary basalt which thickens to the west infilling a palaeo-topographic low.

4.0 Data

The sample data used in this estimation is based on the two drilling programmes in which Fe has been analysed for;

1. 1989 Tasmania Mines Ltd. open hole percussion drilling programme of 58 holes for 495.5m (holes named HM1 through to HM44 with a number of A holes also drilled).
2. 2009 Iron Mountain Mining Pty Limited/Red River Resources Limited RC drilling programme of 31 holes for 1537 metres (holes named BHRC001 to BHRC018 and BHRC020 to BHRC032).

Drill hole collar positions are given for both data sets and have been used as given in the modelling and estimation. There is no down hole survey information due to the nature of the drilling but limited wander is expected.

Surface topographic data has been sourced from the collar survey data for both sets of drill holes combined with the 10m contour data downloaded from the Tasmanian government's LISTmap source.

There are no bulk density calculations for the Hampshire deposit. As noted earlier Whitehead (1990) used 4.08g/cm3 which is believed to be the figure determined from work on the nearby and analogous Kara deposit.

Table 4.1: Drill hole details for holes used in estimation

Hole_ID	Easting	Northing	RL	Length	Azimuth	Dip	Report	Type	Company	DrillDate
HM1	397992.41	5430483.63	486.874	13.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM10	397979.32	5430577.34	488.604	5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM10A	397976.16	5430578.54	488.602	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM11	397986.07	5430561.46	489.288	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM11A	397983.66	5430562.3	489.125	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM12	397970.5	5430554.25	488.314	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM13	397962.6	5430554.36	487.874	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM14	397958.95	5430567.75	487.902	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM15	397964.64	5430568.83	488.063	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM16	397982.22	5430592.69	489.088	5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM16A	397979.06	5430593.83	489.023	10	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM17	397973.57	5430586.47	488.32	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM18	397965.46	5430579.31	487.945	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM18A	397965.26	5430578.5	488.105	6.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM19	397959.82	5430580.72	487.966	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM19A	397960.03	5430579.62	487.96	7	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM2	397975.63	5430511.47	487.426	4.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM20	397968.57	5430592.47	488.32	12	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM21	397975.34	5430597.93	487.562	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM24	397980.76	5430604.12	489.163	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM25	397968.95	5430603.51	488.65	8	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM26	397976.16	5430619.81	488.611	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM27	397972.95	5430631.32	488.318	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM28	397965.9	5430516.14	487.074	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM29	397962.1	5430525.28	487.25	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM2A	397975.64	5430511.47	487.428	10.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM3	397966.4	5430504.63	486.489	4.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM30	397962.95	5430539.87	487.803	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM30A	397961.5	5430540.58	487.751	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM31	397955.85	5430535.07	487.185	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM32	397961.47	5430481.14	486.051	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM32A	397961.55	5430475.02	485.942	3	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM34	397956.94	5430487.02	486.153	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989

HM35	397980.25	5430503.5	487.381	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM36	397972.59	5430499.56	486.726	12	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM37	397965.46	5430495.6	486.416	4	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM37A	397964.31	5430497.2	486.373	8.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM38	397976.81	5430482.83	486.36	2	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM38A	397978.9	5430484.74	486.611	2	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM38B	397974.86	5430484.36	486.364	13	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM39	397975.95	5430490.82	486.95	8	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM3A	397964.24	5430504.73	486.255	11.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM4	397980.91	5430517.61	488.282	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM40	397984.87	5430494.06	487.241	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM41	397996.24	5430491.31	487.558	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM42	397998.28	5430499.7	487.867	9	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM43	397987.47	5430476.19	486.517	6	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM44	397984.15	5430468.49	486.143	14	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM5	397976.21	5430521.2	488.185	13.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM6	397977.74	5430531.14	488.482	12	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM7	397971	5430528.69	487.891	7.5	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM7A	397966.74	5430530.04	487.804	14	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM8	397961.88	5430533.36	487.709	15	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
HM9	397966.95	5430487.58	486.41	11	0	-90	89_3025	OHH	Tas. Mines Ltd.	1989
BHRC001	397942	5430450	482.62	7	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC002	397900	5430461	481.66	10	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC003	397933	5430489	485.27	46	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC004	397897	5430488	483.64	71	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC005	397990	5430530	486.55	46	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC006	397943	5430541	486.79	52	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC007	397927	5430568	486.64	60	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC008	397967	5430569	488.17	47	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC009	397961	5430567	487.95	46	90	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC010	397930	5430610	486.8	39	87	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC011	397970	5430610	489.542	21	98	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC012	397937	5430686	488.397	28	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC013	397925	5430651	489.171	40	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC014	397925	5430651	489.171	28	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC015	398006	5430488	485.291	52	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC016	397923	5430491	480.905	50	210	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC017	397939	5430454	480	98	302	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC018	397952	5430528	486.9	64	90	-60	09_5796	RC	Red River/Iron Mtn.	2008
BHRC020	397965	5430491	483.202	30	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC021	397875	5430490	480	88	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC022	397895	5430460	480	70	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC023	397895	5430560	482.892	46	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC024	397895	5430540	481.872	46	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC025	397895	5430610	485.44	46	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC026	397895	5430650	487.479	34	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC027	397895	5430690	486.066	34	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC028	397930	5430730	485.946	34	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC029	397850	5430460	480.309	113	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC030	397850	5430490	480	100	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC031	397850	5430560	480.431	60	0	-90	09_5796	RC	Red River/Iron Mtn.	2008
BHRC032	397850	5430610	482.98	55	0	-90	09_5796	RC	Red River/Iron Mtn.	2008

NB: Collar coordinates are GDA94 datum. OHH = open hole hammer rig, RC = reverse circulation. Red River = Red River Resources Limited, Iron Mtn. = Iron Mountain Mining Limited.

Table 4.2: Drill hole intersections used in estimation

hole_id	from (m)	to (m)	interval (m)	Fe (%)
BHRC003	12	22	10	42.16
BHRC004	40	52	12	39.65
BHRC006	7	13	6	48.58
BHRC007	13	23	10	34.84
BHRC008	0	4	4	54.2
BHRC009	0	5	5	64.88
BHRC010	10	17	7	46.41
BHRC011	0	4	4	48.5
BHRC012	8	21	13	28.02
BHRC013	15	23	8	48.36
BHRC014	3	8	5	43.52
BHRC015	0	4	4	46.275
BHRC016	35	50	15	47.62
BHRC017	20	32	12	47.25
BHRC018	3	12	9	45.22
BHRC020	5	12	7	53.34
BHRC021	79	86	7	26.36
BHRC022	59	66	7	37.89
BHRC023	33	41	8	48.725
BHRC024	37	42	5	54.86
BHRC025	33	42	9	35.12
HM1	0	13.5	13.5	47.97
HM11	0	3	3	58.5
HM11A	0	6	6	54.05
HM12	0	6	6	60
HM13	0	12	12	52.775
HM14	0	9	9	55.87
HM15	0	6	6	57
HM17	0	3	3	45.4
HM18	0	3	3	55.9
HM18A	0	6.5	6.5	44.68
HM19	0	3	3	32.3
HM19A	3	7	4	58.425
HM2	0	4.5	4.5	41.67
HM29	0	15	15	41.24
HM2A	0	10.5	10.5	50.34
HM3	0	4.5	4.5	43.7
HM33	0	11	11	36.33
HM3A	3	11.5	8.5	60.49
HM4	0	6	6	50.85
HM5	0	9	9	44.77
HM6	0	6	6	53.2
HM7	0	7.5	7.5	54.24
HM7A	0	14	14	56.44
HM8	0	15	15	51.54
HM9	3	11	8	42.46

Table 4.3: Raw Assay Statistics

Drill Programme	Number of Samples	Mean	Standard Deviation
1990 Tasmania Mines	98	41.3	17.2
2009 Red River/Iron Mtn.	211	37.2	18.6

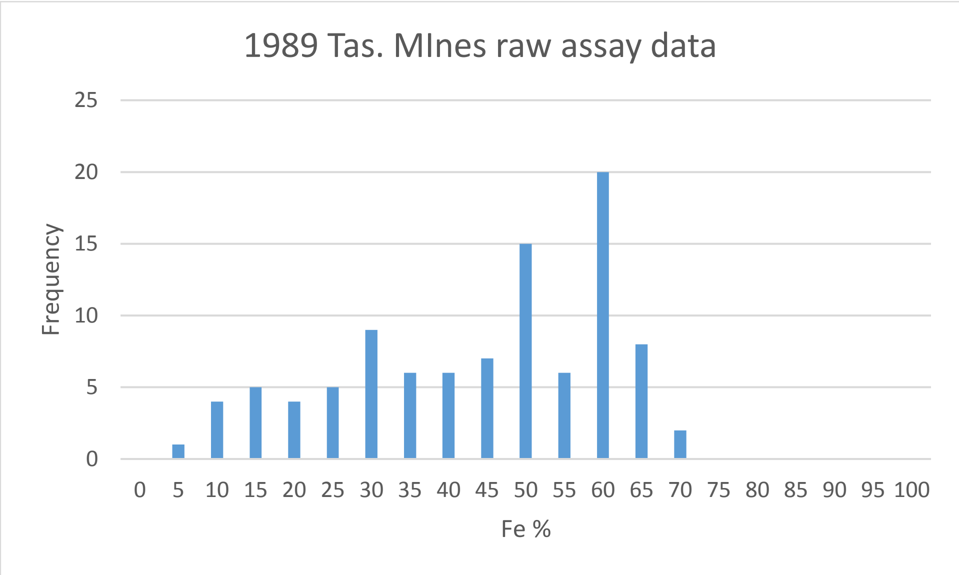

Figure 4.1: 1989 Tasmania Mines drilling raw assay histogram.

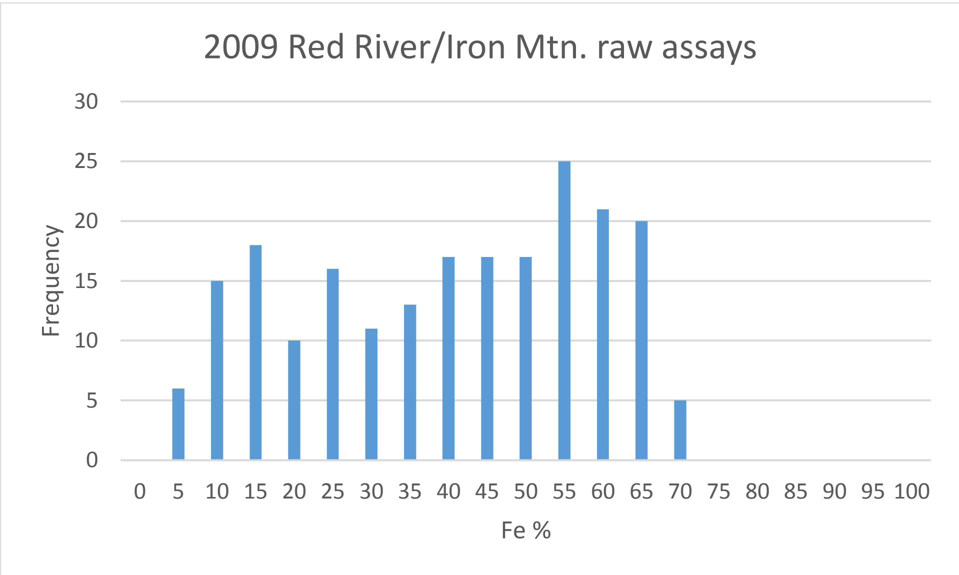

Figure 4.2: 2009 Tasmania Mines drilling raw assay histogram.

Drill hole data is stored in an ACCESS database included in appendix A as *EL352006_201802_05_AppendixA_Hampshire_database*

5.0 Data Quality and Verification

The data used in this estimation is of less than ideal quality.

The lack of directly measured S.G. data is of concern as it directly affects tonnages. This issue can be partly resolved by drilling new holes, undertaking direct measurements, and applying the new data to the volumes estimated herein.

The drilling methodology used to generate the two drill sample data sets are of markedly different quality. The latter data set, the 2009 Iron Mountain/Red River Resources data, is from face sampling percussion (RC) drilling with limited scope for contamination. The earlier data set, the 1989 Tasmania Mines data, is from open hole percussion drilling with considerable scope for contamination.

Drill hole locations are of variable quality with collar positions for the 1989 drilling surveyed accurately by certified surveyors. An accuracy of +/- 0.1m may be assumed here. RL's are also accurate to ~0.1m.

The methodology for determining the collar positions for the 2009 drilling are not given. The coordinates for the first 18 holes appear to be rounded to the nearest metre and may have been surveyed by differential GPS though this is not stated. An accuracy of +/- 1m may be assumed here but with caution. Coordinates for the subsequent holes are all rounded to the nearest 5m indicating that non-differential GPS was used. Here an accuracy of +/- 5m must be assumed. No RL was given for these collars. An RL has been determined from the surface DTM which was generated from a combination of the LISTmap 10m contour topographic data and the 1989 drill collars.

There is no QA/QC data for either data set with no duplicates, standards or blanks reported. There have also been no drill holes which may have acted as field duplicates.

The relatively poor data quality, i.e.

- drilling methodology
- collar surveys
- downhole surveys
- lack of QA/QC
- lack of S.G. data

all mean the estimated resource must be considered as Inferred though given the nature of the mineralisation it is likely to be confirmed by any subsequent work.

6.0 Geological interpretation and modelling

6.1 Introduction

Modelling was undertaken using SURPAC's 3D modelling software. Drill hole sample data was stored in an ACCESS database. Wireframing was done by snapping to drillhole intersections in 3D.

3DMs were constructed of

- topography
- basalt lower contact
- orebody hangingwall
- orebody footwall
- granite upper contact

6.2 Topography

The surface topography surface was created from a combination of the 10m LISTmap contour data with the conventionally surveyed 1989 auger hole collars added.

6.3 Basalt Lower Contact

Tertiary basalt overlies the skarned sequence with an erosional unconformable contact yet does not scour into the magnetite skarn. In fact basalt onlaps against the magnetite skarns upper contact near surface.

The basalt lower contact was modelled at the base of the massive basalt.

A problem occurs along the westernmost line of drilling where drill logs for BHRC29, 30 & 31 have skarn (pyroxene skarn) logged as overlying basalt. There is insufficient information to clarify the nature of these units and it remains a possibility that the holes were incorrectly logged. Regardless this ambiguity has no immediate impact on the resource model.

6.4 Orebody

The geological interpretation is reasonably simple;

- stratabound body of reasonably consistent 5m to 12m thickness (exceptions being thicker intersections in BHRC004 & 012)
- apparently gently folded lying on the western limb of an antiform shape probably reflecting primary bedding
- pinches out along its northern margin against a shallowing granite body
- potentially meets the granite contact again more obtusely at depth to the west

The orebody was modelled utilising assays principally using a nominal cut-off grade of 15% Fe, with some reference to lithology.

The upper zone of mineralisation in BHRC002 was not included in modelling though further drilling and mine planning should assess the lateral persistence of this zone.

Perhaps conversely the whole of the zone intersected in BHRC012 was included in the northeastern part though much of this is lower grade skarn.

Surface geological contacts were taken from Mineral Resources Tasmania's 1:25,000 mapping.

The southern and western margins were projected approximately half-drill-spacing of ~30m.

The orebody as modelled is 300m long, 170m wide and extends from surface (490masl) to 385masl.

The orebody model is included in Appendix A as *EL352006_201802_03_AppendixA_ore.dtm/EL352006_201802_03_AppendixA_ore.str*

6.5 Granite Upper Contact

The upper contact of the granite is problematic away from the northern part of the deposit due to lack of information.

The granite upper contact was modelled using the drill intersections and MRT's 1:25,000 mapping.

In the central area holes BHRC005, 7, 8 & 9 failed to reach the granite. The granite contact was modelled as being 5m beyond these drill holes.

7.0 Statistical analysis

7.1 Introduction

Limited statistical analysis was performed on the data as there are clear deficiencies in the data set (collar positions, assaying QA/QC) which would make any results inconclusive.

The resource has been given Inferred Status in part on the basis of these deficiencies.

Table 7.1: Composite Statistics

Drill Programme	Number of Samples	Mean	Standard Deviation
1990 Tasmania Mines	196	49.9	10.8
2009 Red River/Iron Mtn.	167	43.4	14.7

Composites were generated down hole using SURPAC.

Raw sample length statistics: Number of samples = 239, Total = 366.50, Minimum = 0.50, Maximum = 3.00, Mean = 1.53, Standard deviation = 0.869, Variance = 0.755

Composite sample length statistics: String 6, Number of samples = 363, Total = 363.00, Minimum = 1.00, Maximum = 1.00, Mean = 1.00, Standard deviation = 0.000, Variance = 0.000

Composites are included in Appendix A as *EL352006_201802_06_AppendixA_1m_comps1.str*

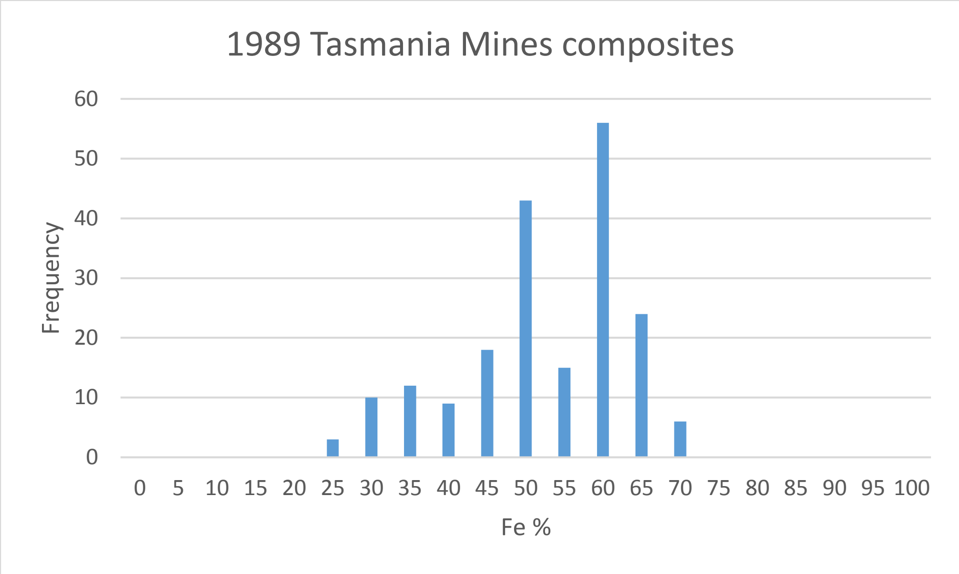

Figure 7.1: 1989 Tasmania Mines drilling composites histogram.

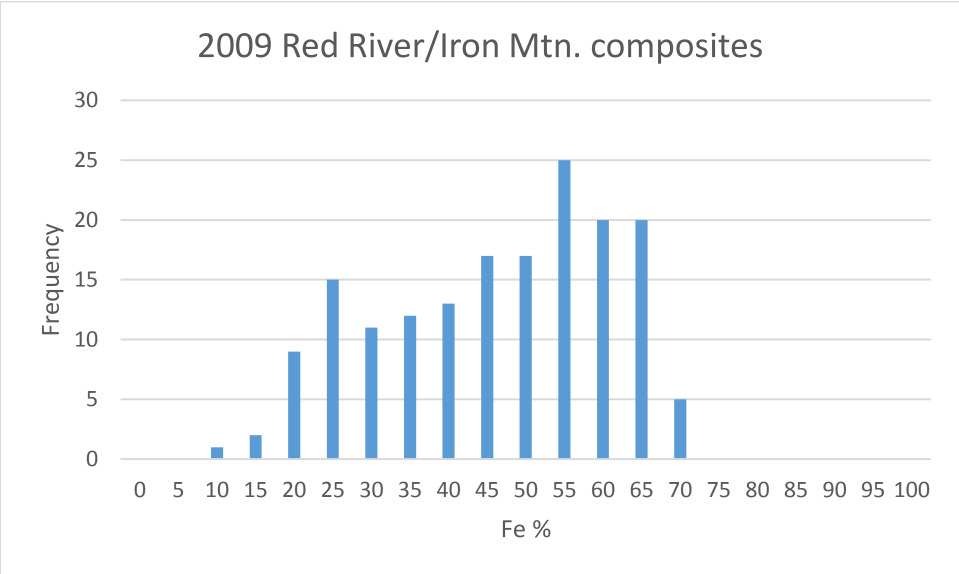

Figure 7.2: 1989 Tasmania Mines drilling raw assay histogram.

7.2 Bulk Density

Bulk density was not determined in either of the drilling programmes.

Whitehead (1990) uses a figure of 4.08 t/m3 based on a number of years working on the Kara deposits immediately nearby and that figure was used in this estimation.

8.0 Block modelling

The resource was estimated using SURPAC's block modelling function.

A block model with blocks oriented north-south was created with blocks 5m in the X direction, 10m in the Y direction and 2.5m in the Z direction.

Sub-blocking to 1.25mX x 2.5mY x 0.625mZ was allowed.

Attributes assigned are:

- rocktype (rocktype = 2 for waste, rocktype = 1 for ore)
- fe %

The block model is included in Appendix A as *EL352006_201802_07_AppendixA_hampshire2.mdl*

9.0 Grade estimation

9.1 Introduction

The resource was estimated using SURPAC's block modelling function.

9.2 Inverse Distance Squared

The estimation method utilised was Inverse Distance Squared. A 100m spherical search ellipse was used. Minimum 3 samples and maximum 15 samples per block. 6 discretisation points.

9.3 Validation

The block model has been verified visually against drill sections in figures 9.3 to 9.9.

The 3DM solid has a volume of 217,115 cubic metres which compares with a total volume for the block model of 217,297 cubic metres.

9.4 Resource reporting

Tons and grade calculated from the estimation are detailed below.

Total resource (0% Fe cut-off) is 886,571t @ 44.12% Fe

Table 9.1: Tons and grade

Cut-off Fe grade (%)	Volume (m3)	Tons	Grade Fe (%)
60	313	1275	60.63
55	9652	39382	57.05
50	45035	183743	53.03
45	117555	479623	49.57
40	158613	647142	47.83
35	189352	772554	46.16
30	201887	823698	45.32
25	212074	885663	44.14
20	217297	886571	44.12

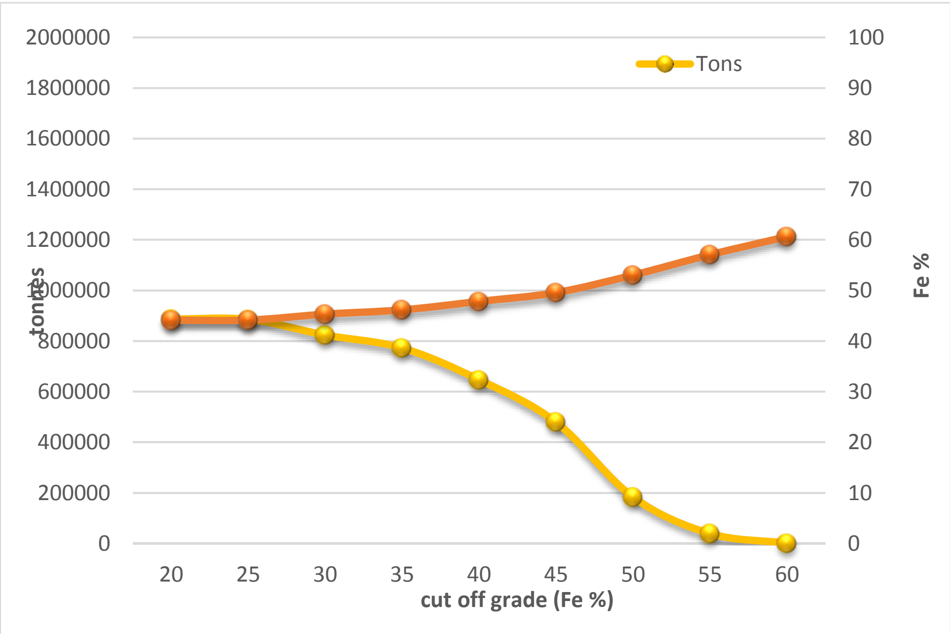

Figure 9.1: Tons and grade curve for Hampshire magnetite resource.

Tons and grade data is also included in Appendix A as *EL352006_201802_08_AppendixA_tons_and_grade_and_graph.xls*

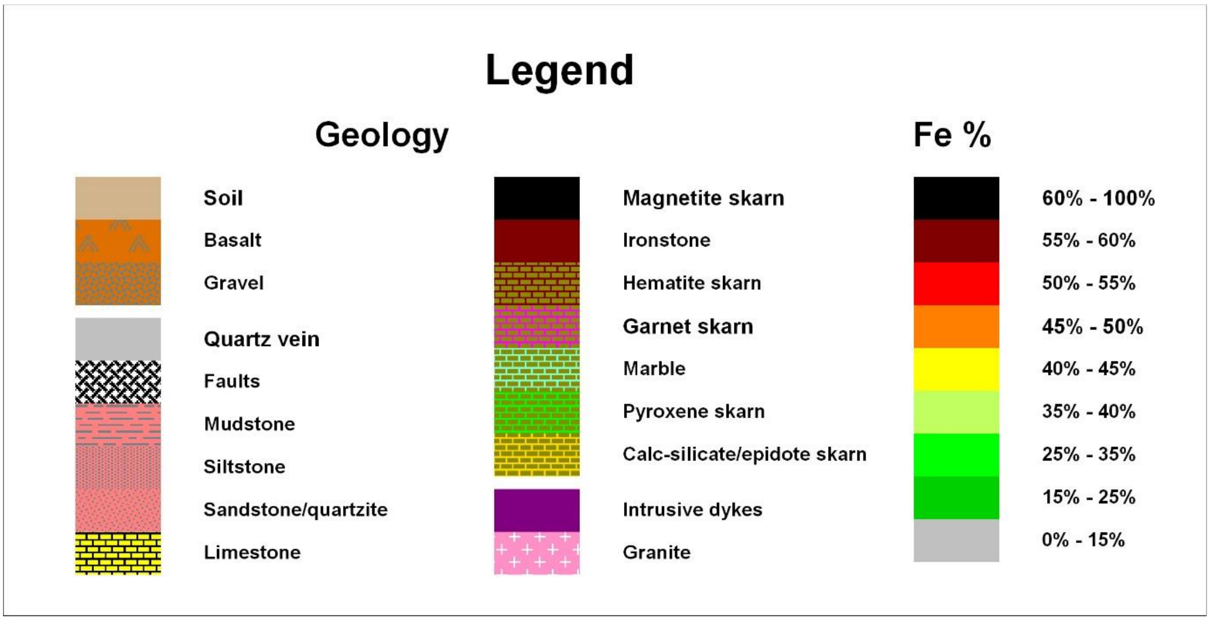

Figure 9.2: Legend for figures 9.2 to 9.9.

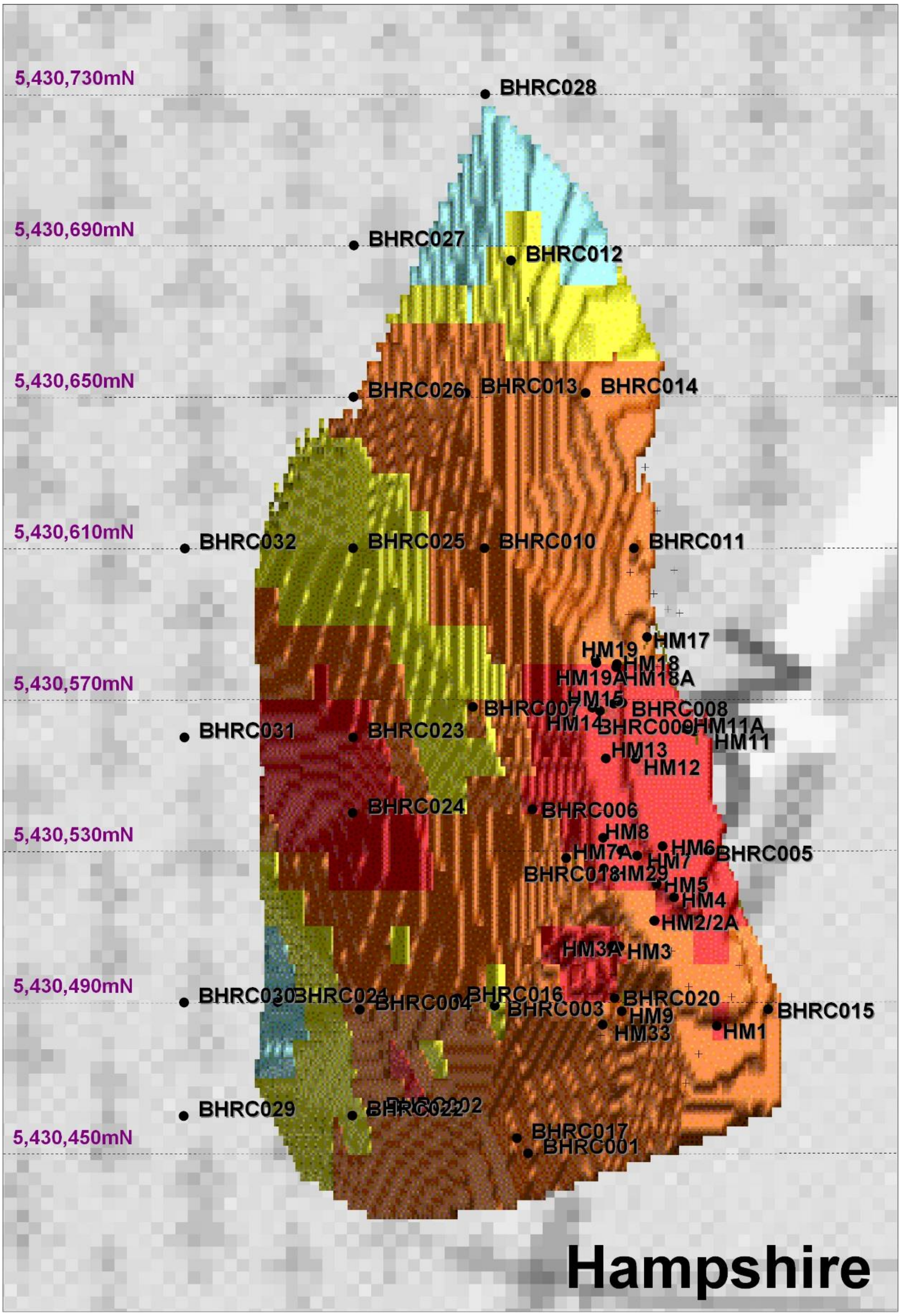

Figure 9.3: Plan view of Hampshire resource showing resource block model (grades as per figure 9.2) and drill hole collars.

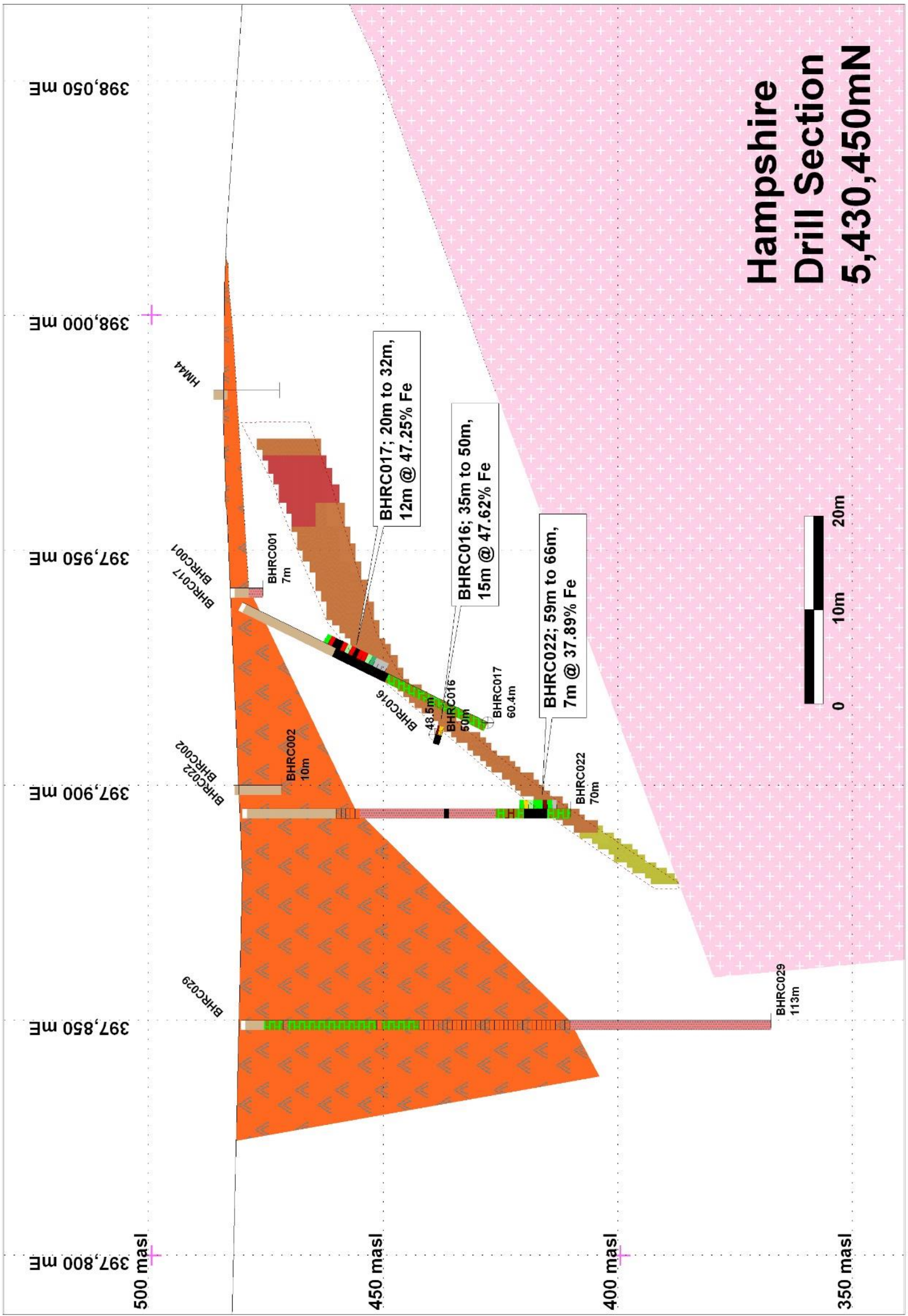

Figure 9.4: Hampshire drill section 5,430,450mN.

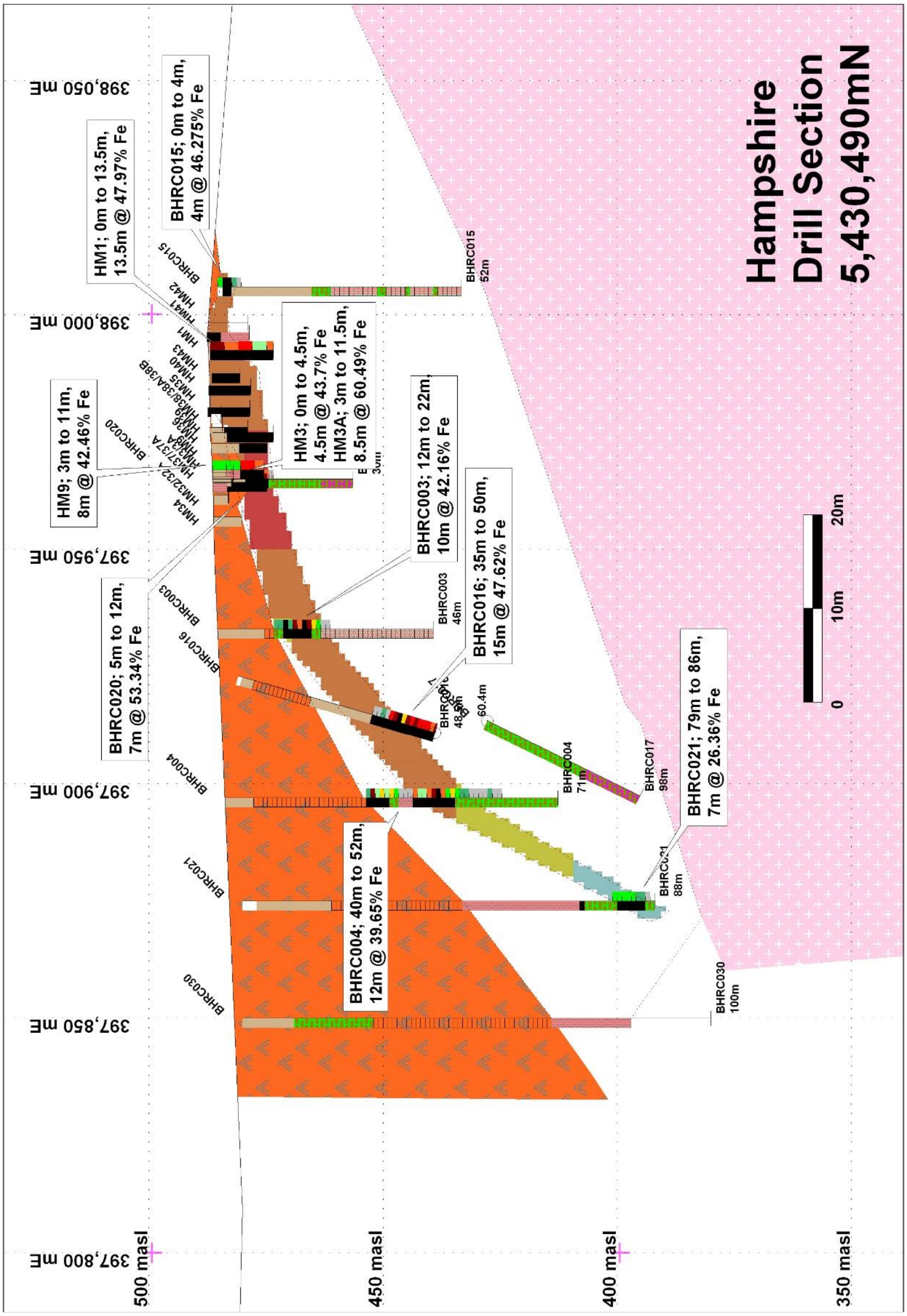

Figure 9.5: Hampshire drill section 5,430,490mN.

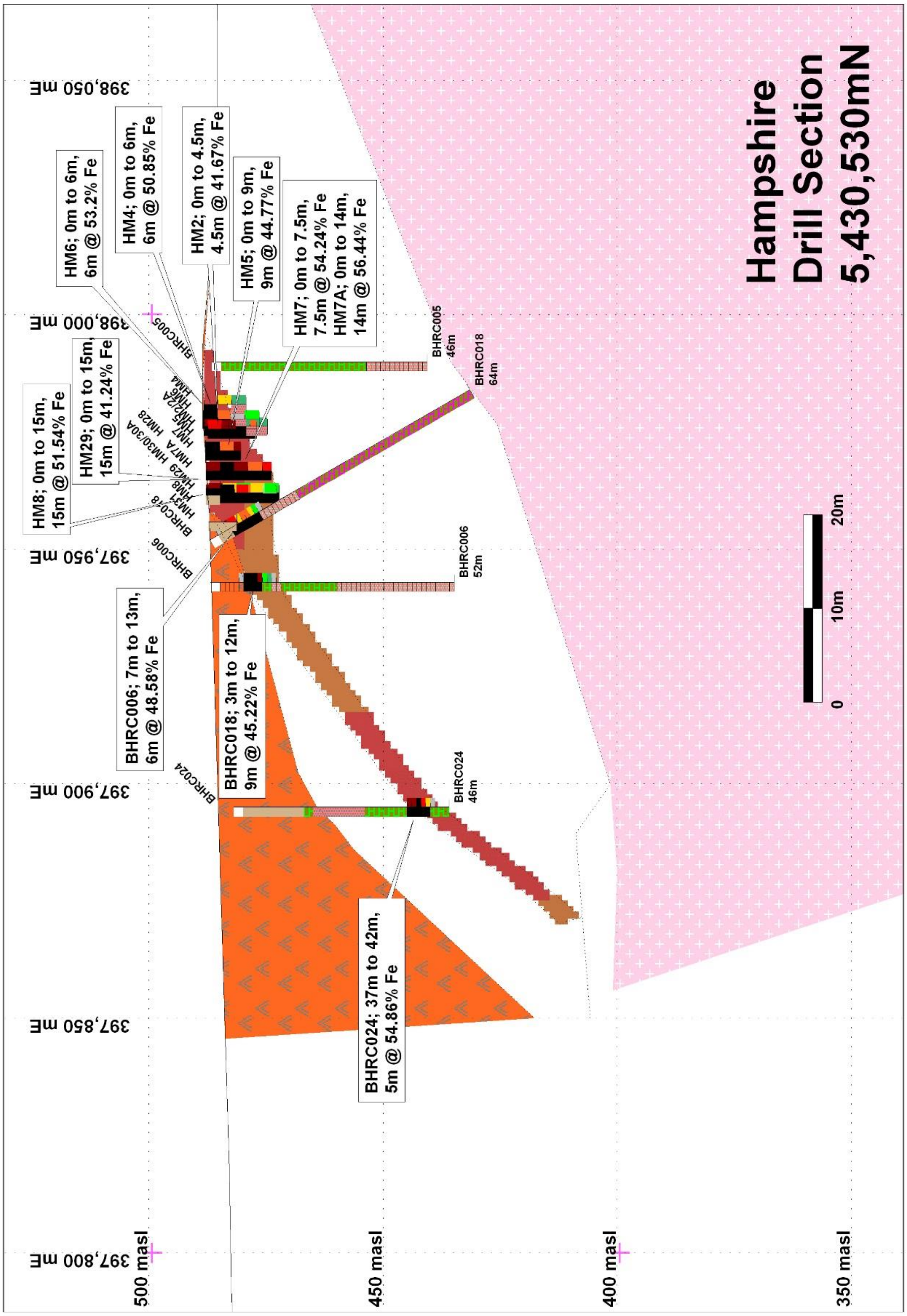

Figure 9.6: Hampshire drill section 5,430,530mN.

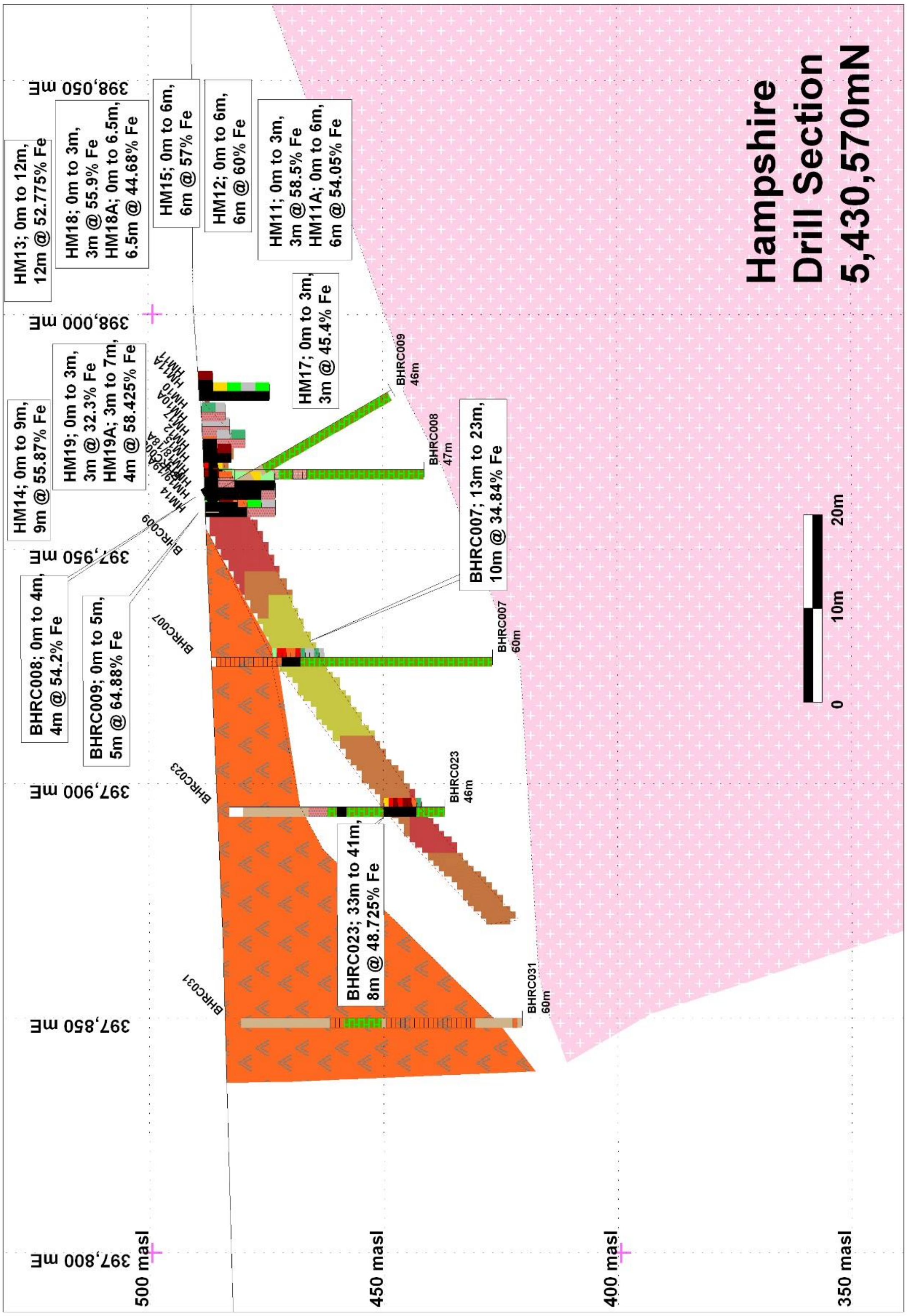

Figure 9.7: Hampshire drill section 5,430,570mN.

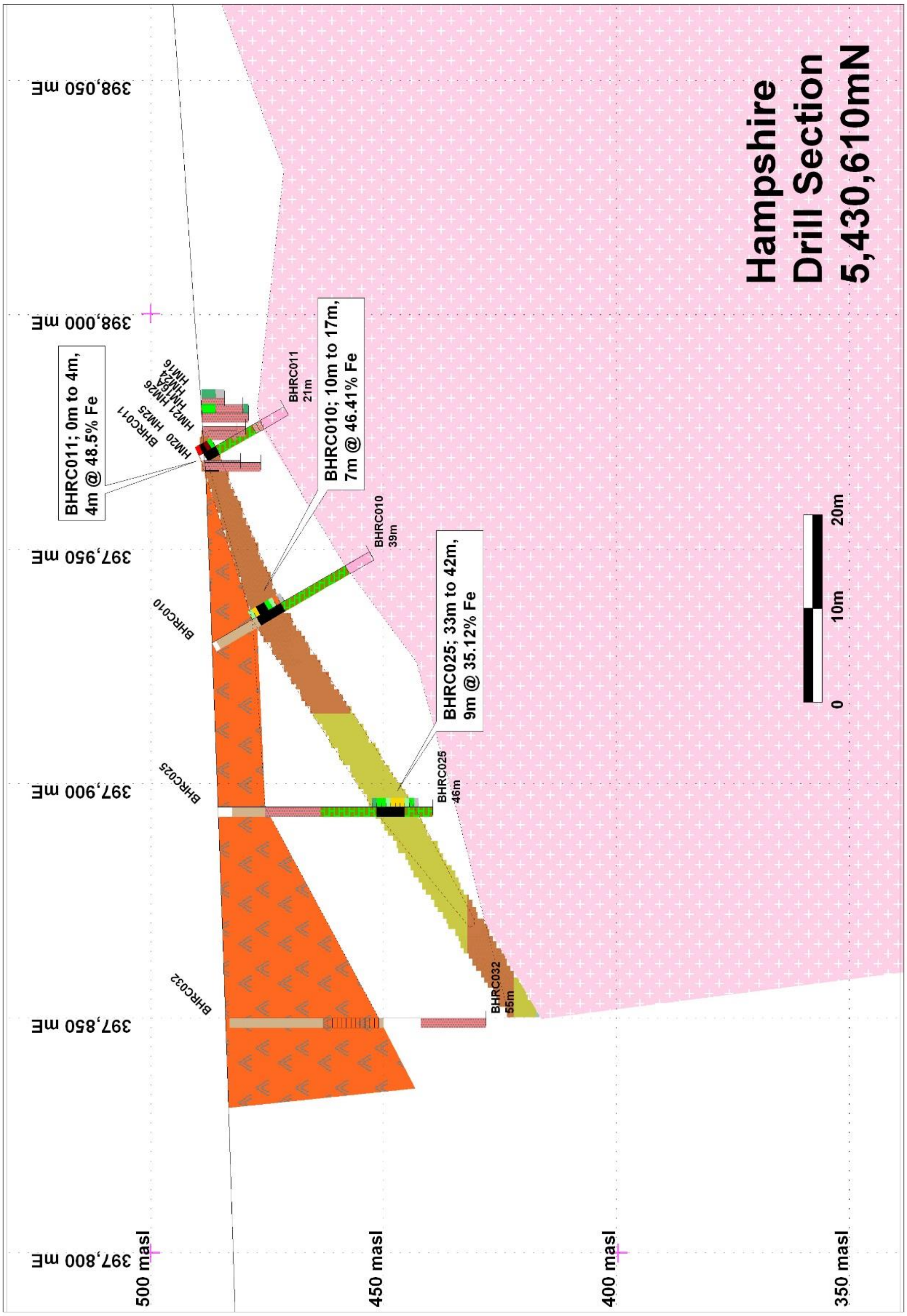

Figure 9.8: Hampshire drill section 5,430,610mN.

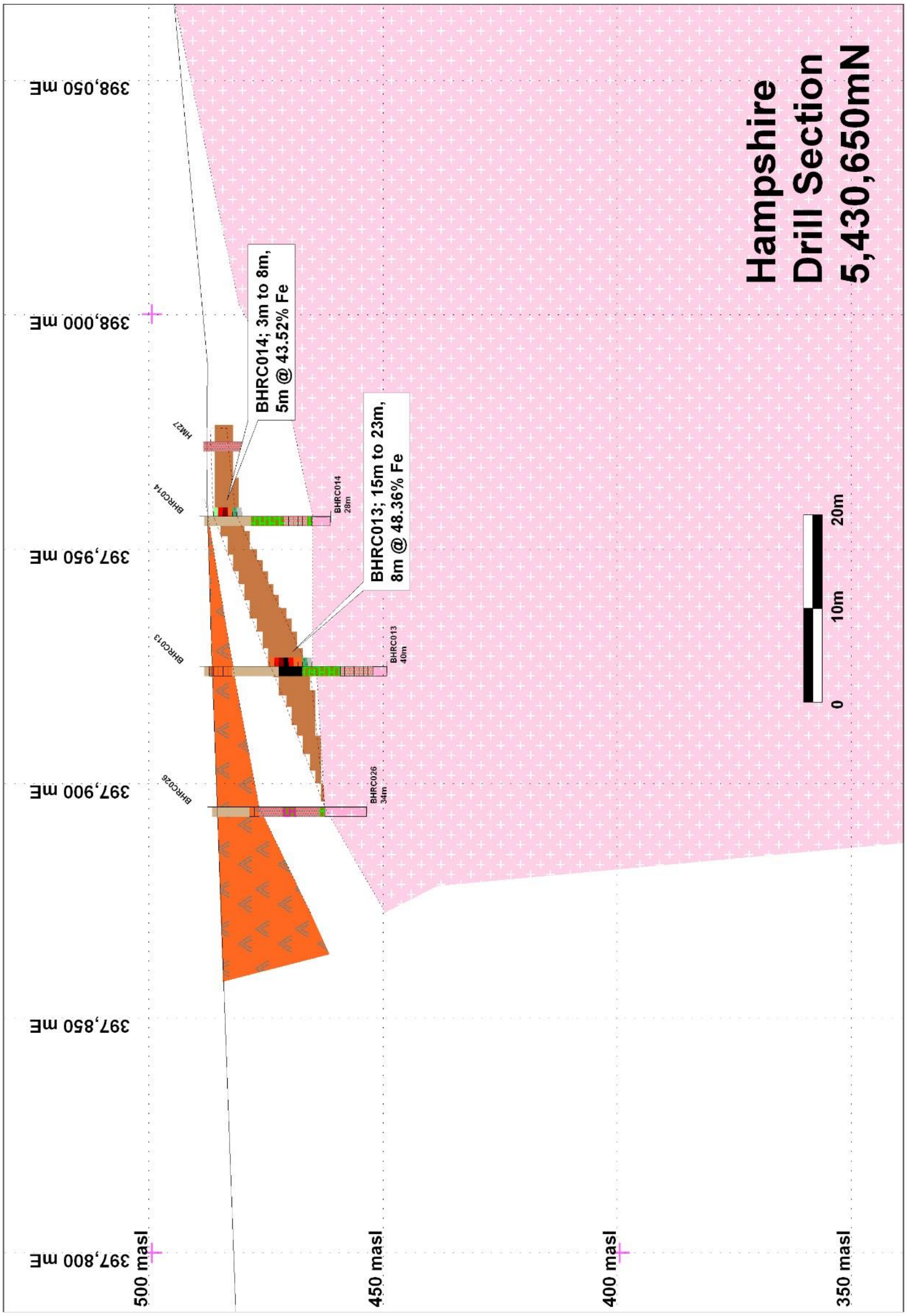

Figure 9.9: Hampshire drill section 5,430,650mN.

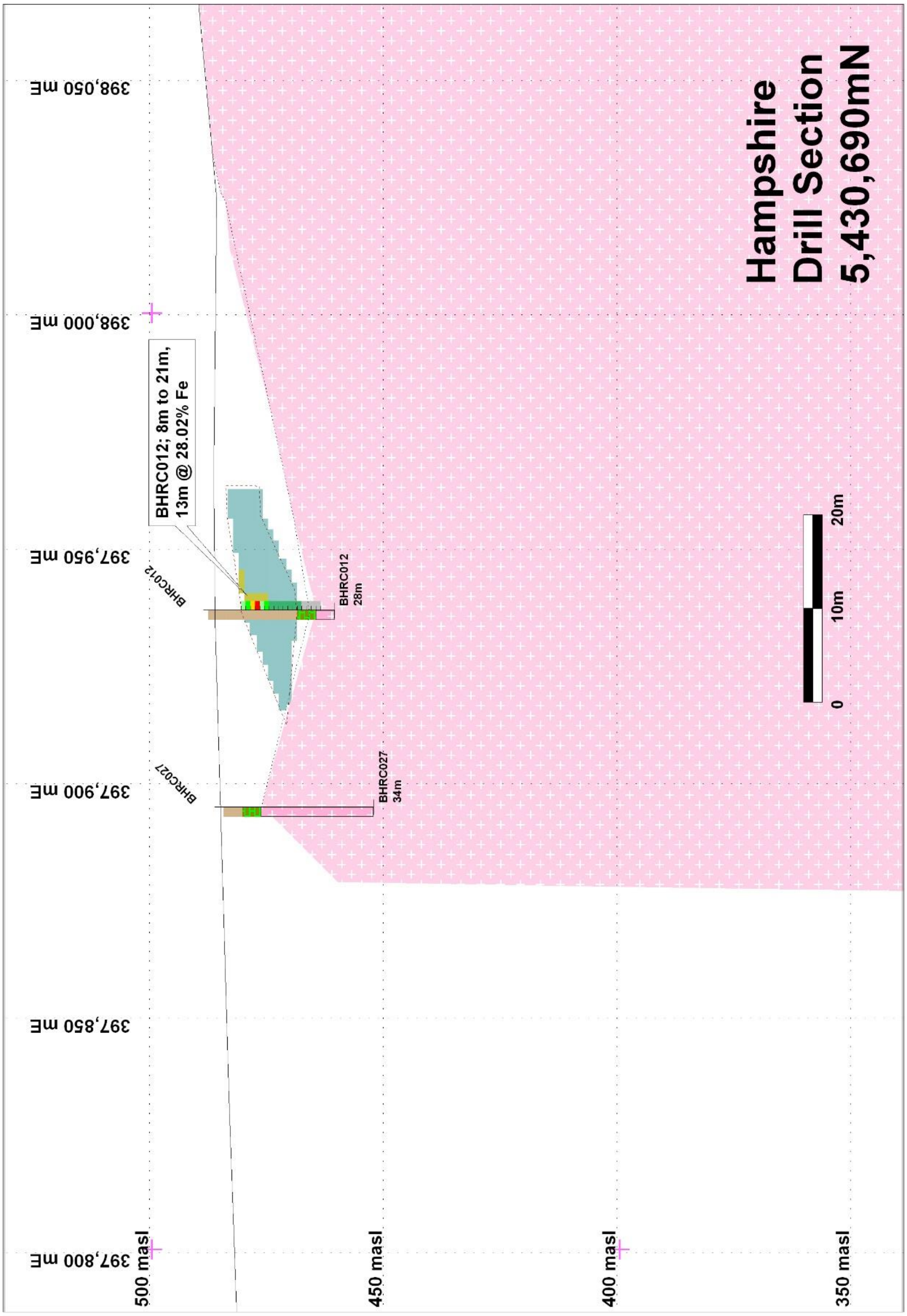

Figure 9.10: Hampshire drill section 5,430,690mN.

10.0 Potential to Extend or Add to Resource Base

The Hampshire magnetite deposit was discovered and defined initially by air and ground magnetics. Air and ground magnetic anomalism continues south of the current drilled area at Hampshire indicating that there is considerable potential to extend the resource in this direction.

There is also an area in the northeasternmost corner with potential for a small addition to the total resource.

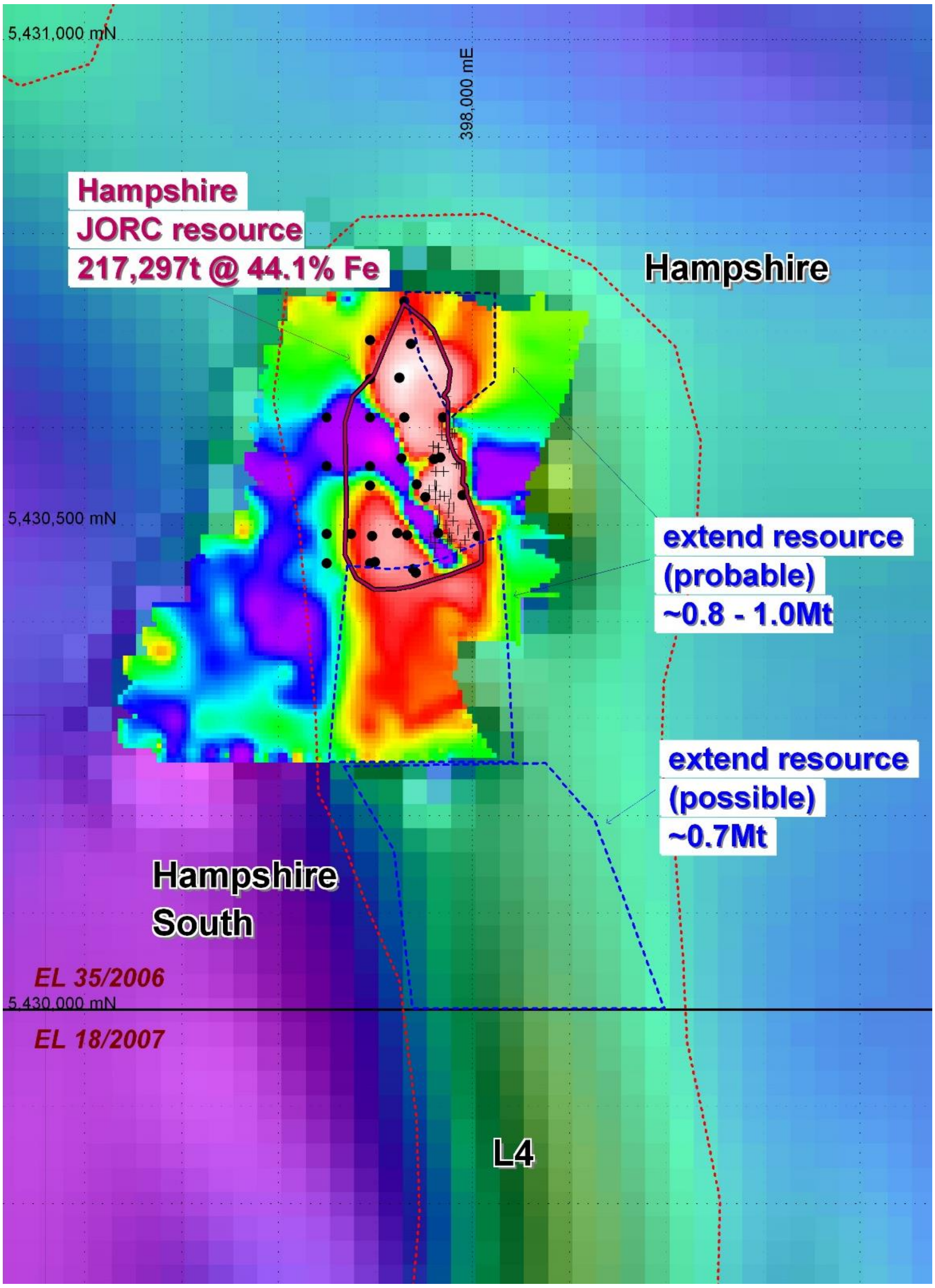

Figure 10.1: Hampshire deposit showing outline of resource estimated herein, BHRC series holes as spots and HM series holes as crosses, superimposed on ground magnetics and air magnetics total magntic intensity (reduced to the pole).

11.0 References

Anon. (1974). Auger Hole Reports Oct. '71 to May '74. Unpub. rept. for ANZECO **[TCR 74_1013]**

Atkinson, W.J. (1958). The Preliminary Investigation of Iron Deposits in the Burnie-Penguin Area unpub. company rept. King D./Rio Tinto Australian Exploration Pty Ltd **[TCR 58_0240]**

Blake, F. (1928). Iron ore deposits of Tasmania. **[UR1928B_169_178]**

Henderson, O.J. (1936). Notes on An Iron Deposit near Highclere. **[UR1936_054_56]**

Kruger, D.R. (1974). Summary Report on Hampshire Magnetite. unpub. rept. for ANZECO **[TCR 74-1007]**

Kusnandar, K., Zlatkov, G. and Mayer, A. (2009). Blythe Project Northern Tasmania Annual Report unpub. rept. for Iron Mountain Mining Limited/Red River Resources Limited for EL35/2006 ("Hampshire 1") **[09_5796]**

Reid, A.M. (1924). Preliminary report on the deposits of iron ore at Hampshire Hills **[UR1924_189_196]**

Whitehead, C.H. (1989). Exploration Licence 17/68, Kara–Hampshire, N.W. Tasmania, Annual Report unpub. rept. for Tasmania Mines Limited, 4th November, 1988 to 4th November, 1989 **[89_3025]**

JORC Code, 2012 Edition – Table 1 report template

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	2 historic data sets, • Tasmania Mines Limited 1989 (Whitehead, 1989). • Red River Resources Limited/Iron Mountain Mining Limited 2009 (Kusnander *et. al.* 2009) No reference to sampling methods in reports.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	2 data sets • 1989 Tasmania Mines Limited drilling was open hole percussion using a blasthole rig • 2009 Red River/Iron Mtn. drilling was face sampling RC

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	Recoveries unable to be determined in percussion drilling – recoveries unknown. No known sampling biased due to recoveries
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Chips logged in both programmes by qualified geologists. Some concern about some interpretations in 2009 drilling programme
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being*	• No mention of sampling methodologies in either instance. • No QA/QC reported • Due to commodity being Fe in range 25-65% sampling methodology should be representative

Criteria	JORC Code explanation	Commentary
	sampled.	
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• No indication of who assayed samples but expected to be accredited laboratories.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• There has been no independent verification by resampling or twinning. • No such significant intersections are likely to cause an issue. • Data was hand entered from hard copy of the 1989 data. 2009 data was supplied as a .txt file
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Collar survey conventional for 1989 drilling i.e. +/- 0.1m • Collar survey hand held GPS for 2009 drilling i.e. +/- 3m at least • Topography based largely on 10m contours with the 1989 collars also. No issues with use of coarse topographic surface as orebody subsurface for the most part, surfaces near 1989 holes. • The grid used is MGA94 zone 55.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation*	• Data spacing sufficient to establish continuity of geology and grade

Criteria	JORC Code explanation	Commentary
	procedure(s) and classifications applied. • *Whether sample compositing has been applied.*	
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• All holes drilled vertical or dipping east against the west dip of the orebody
Sample security	• *The measures taken to ensure sample security.*	• None known of
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• The database was audited by separate geologist

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Audited database visually separate geologist
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Site visits have been made
Geologica l interpretat ion	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity*	• Strong confidence in relatively simple geological model • Excluded upper intersection in BHRC004 as it is not seen in adjacent holes. • Mineralisation appears to be stratabound and not reflecting distance from granite contact

Criteria	JORC Code explanation	Commentary
	both of grade and geology.	
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• 300m long, 170m wide, from surface (490masl) to 385masl
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Inverse Distance Squared with 100m x 100m spherical search. • Previous estimate by Whitehead (1989) using a polygonal method, calculated that the northernmost 125m of strike of the deposit contained 158,768 tons of ore averaging 52.56% Fe to a depth of 15m. An S.G. of 4.08g/cm3 was used. • No consideration of deleterious elements. • Grade cutting not required in bulk commodity ore type.

Criteria	JORC Code explanation	Commentary
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tons are dry tons
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	•
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Assumed deposit viable where mineable by open cut and modelled accodingly
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• No consideration of metallurgy other than the assumption that all Fe is found in magnetite which needs confirmation
Environmen-tal factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage*	• No consideration of waste

Criteria	JORC Code explanation	Commentary
	the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• No measuremnts of bulk density are given. A number 4.08t/m3 as used by Whitehead (1989) from work at Kara is considered to be sufficient for an Inferred Resource
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	Classified as Inferred on basis of • poor collar control for 2009 drilling • lack of QA/QC for both programmes • No twins or umpire duplicates • Lack of Bulk Density measurements • Open hole nature of 1989 drilling
Audits or reviews	•	•
Discussion of relative accuracy/	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent*	• Whilst classified as Inferred the author has reasonably strong confidence in the total resource

Criteria	JORC Code explanation	Commentary
confidence	*Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	