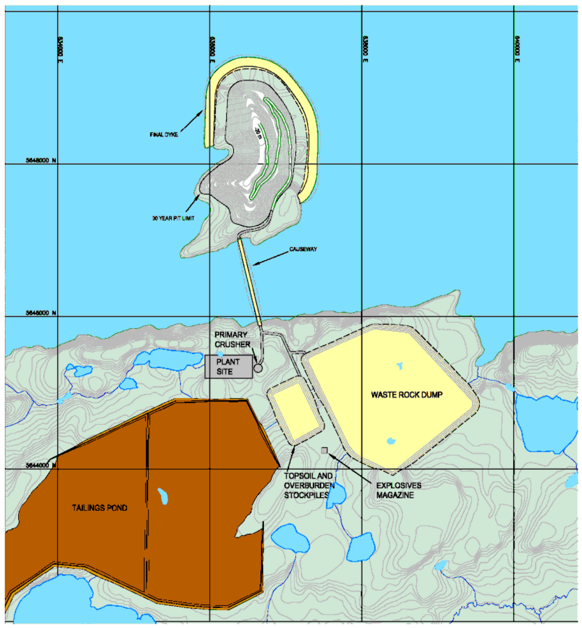
NI 43-101 TECHNICAL REPORT ON THE PRELIMINARY ECONOMIC ASSESSMENT ON LAKE ST. JOSEPH IRON PROPERTY ONTARIO – CANADA



FINAL REPORT

Prepared for

Rockex Mining Corporation

www.rockexmining.com

Prepared by

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Effective Date: August 27, 2013
Issue Date: October 11, 2013

Project Number: 2013-023

IMPORTANT NOTICE

This Report was prepared as a National Instrument 43-101 Technical Report for Rockex Mining Corporation ("**Rockex**") by Met-Chem Canada Inc. ("**Met-Chem**"). The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in Met-Chem's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this Report. This Report can be filed as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101, *Standards of Disclosure for Mineral Projects*. Except for the purposes legislated under Canadian securities laws, any other uses of this Report by any third party are at that party's sole risk.

DATE AND SIGNATURE PAGE - CERTIFICATES

Effective Date: August 27, 2013

Issue Date: October 11, 2013

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Yves A. Buro, Eng., do hereby certify that:

1) I am a Senior Geologist presently with Met-Chem Canada Inc. (Met-Chem) with an office situated at Suite 300, 555 René-Lévesque West Blvd, Montreal, Canada;

2) I am a graduate of University of Geneva, Switzerland with the equivalent of a B.Sc. and a M.Sc. in Geology obtained in 1976;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (42279);

4) I have worked as a geologist continuously since graduation from University in 1976. I have gained direct experience on iron deposits similar to the Lake St. Joseph Iron Property, as exploration geologist, in Canada, the USA, Africa, India, South America;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Sections 4 to 12, 23 and portions of Sections 1, 2, 3, 25 and 26;

7) I visited the site property that is the subject of this Technical Report in June 2013 for 3 days;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Yves A. Buro"

Yves A. Buro, Eng.
Senior Geological Engineer
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To Accompany the Report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013.

I, Schadrac Ibrango, P.Geo., Ph.D., do hereby certify that:

1) I am a Senior Geologist with Met-Chem Canada Inc. ("**Met-Chem**") with an office situated at Suite 300, 555 René-Lévesque West Blvd, Montreal, Canada;

2) I am a graduate of University of Ouagadougou (Burkina-Faso) with a Master Degree in Geology obtained in 1998 and a Ph.D. in Engineering of Darmstadt University of Technology (Germany) obtained in 2005;

3) I am a member in good standing of the "*Ordre des Géologues du Québec*" (1102);

4) I have practiced my profession continuously since 1998. I have gained direct experience on iron deposits similar to the Lake St. Joseph Iron Deposit, as a geologist in Canada;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Section 14 and portions of Sections 1, 2, 3, 25 and 26;

7) I have not visited the project site;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Schadrac Ibrango"

____

Schadrac Ibrango, P.Geo., Ph.D.
Senior Geologist
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Jeffrey Cassoff, Eng., do hereby certify that:

1) I am the Lead Mining Engineer presently with Met-Chem Canada Inc with an office situated at Suite 300, 555 René-Lévesque West Blvd, Montréal, Canada;

2) I am a graduate of McGill University in Montréal with a Bachelor's in Mining Engineering obtained in 1999;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (5002252);

4) I have worked as a mining engineer continuously since graduation from university in 1999;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Section 16 and portions of Sections 1, 2, 3, 25 and 26;

7) I visited the site property that is the subject of this Technical Report in June 2013 for 3 days;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Jeffrey Cassoff"

____

Jeffrey Cassoff, Eng.
Lead Mining Engineer
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Ryan Cunningham, Eng. do hereby certify that:

1) I am Process Engineer with Met-Chem Canada Inc. with an office situated at Suite 300, 555 René-Lévesque Blvd. West, Montreal, Canada;

2) I am a graduate of McGill Engineering with a B.Eng. and a M.Eng in Metallurgical Engineering in 2005 and 2009 respectfully;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (145792);

4) I have practiced my profession for the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes more than five (5) years in mineral processing research and more than five (5) years in consulting practice related to mineral processing, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Sections 13 and 17;

7) I have not visited the property;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Ryan Cunningham"

Ryan Cunningham, Eng.
Process Engineer
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Alain Michaud, Eng., do hereby certify that:

1) I am Manager, Estimation with Met-Chem Canada with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate from *École Polytechnique de Montréal* with B.Eng. in Mechanical Engineering in 1986;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (41788);

4) I have worked as an Estimator in the Mining Industry for the last 8 years;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Section 21.1 and portions of Sections 1, 2, and 3;

7) I have not visited the property;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Alain Michaud"

____

Alain Michaud, Eng.
Manager, Estimation
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Mary Jean Buchanan, Eng., M.Env., do hereby certify that:

1) I am a Senior Project Manager and Senior Environmental Engineer with Met-Chem Canada Inc. with an office situated at Suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate of *Université du Québec à Chicoutimi* with B.Eng. in Geological Engineering in 1983 and of the *Université de Sherbrooke* with a M.Env. (Master degree in Environment) in 1997;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (38671);

4) I have practiced my profession for the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes 27 years in consulting practice related to resource estimates, mine engineering and environmental assessment, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Section 20 and portions of Sections 1, 2, 3, 25 and 26;

7) I have not visited the property;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Mary Jean Buchanan"

____

Mary Jean Buchanan, Eng., M.Env.
Senior Project Manager
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Michel L. Bilodeau, Eng., do hereby certify that:

1) I am a retired (June 2009) Associate Professor from the Department of Mining and Materials Engineering of McGill University, 3450 University St., Montreal, QC, Canada H3A 2A7, and have continued teaching on a contract basis the mineral economics course of the mining engineering program at McGill in the Winter terms of 2010, 2011 and 2012;

2) I am a graduate of *École Polytechnique de Montréal* with a B. Eng. in Geological Engineering (1970), and of McGill University with a M. Sc. (App.) in mineral exploration (1972) and a Ph.D. in mineral economics (1975);

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (23799);

4) I have taught continuously in the areas of engineering economy, mineral economics and mining project feasibility studies in the mining engineering program dispensed by McGill University since my graduation from university, and have carried out in the capacity of independent consultant several assignments related to the economic/financial analysis of mining projects;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I am responsible for section 22 of this Technical Report;

7) I have not visited the property;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Michel Bilodeau, Eng.

Michel L. Bilodeau, Eng.
Economic/Financial Analyst
Consultant for Met-Chem, Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Costinel I. Calota, Eng. do hereby certify that:

1) I am Lead Electrical Engineer with Met-Chem Canada Inc. with an office situated at Suite 300, 555 René-Lévesque Blvd. West, Montreal, Canada;

2) I am a graduate of Electrotechnical Faculty of Craiova, Romania with a B.Sc Eng. in Electrical Engineering in 1976;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (120030);

4) I have practiced my profession for the mining industry and in the heavy industry since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes more than 20 years in mining and heavy industry as maintenance engineer and more than 15 years in mining consulting practice related to mining and mineral processing, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Sections 18.1 and 18.2;

7) I have not visited the property;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Costinel Calota"

____

Costinel Calota, Eng.
Lead Electrical Engineer
Met-Chem Canada Inc.

CERTIFICATE OF AUTHOR

To accompany the technical report entitled "*NI 43-101 Technical Report on the Preliminary Economic Assessment on Lake St. Joseph Iron Property, Ontario-Canada*" dated October 11th, 2013 with effective date of August 27th, 2013 (the "**Technical Report**").

I, Charles H. Cauchon, Eng. do hereby certify that:

1) I am Senior Process Engineer with Met-Chem Canada Inc. with an office situated at Suite 300, 555 René-Lévesque Blvd. West, Montreal, Canada;

2) I am a graduate of l'École Polytechnique de Montréal with a B.Sc Eng. in Mining Engineering in 1960;

3) I am a member in good standing of the "Ordre des Ingénieurs du Québec" (11811);

4) I have practiced my profession for the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes more than 12 years in concentrators and operating plants and more than 36 years in consulting practice related to mineral processing, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of this Technical Report and am responsible for Sections 1, 2, 3, 18.3 to 18.16, 19 and 24 to 26;

7) I visited the site property that is the subject of this Technical Report in June 2013 for 3 days;

8) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Rockex Mining Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Rockex Mining Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Rockex Mining Corporation, or any associated or affiliated companies;

12) I am independent of the issuer as defined in section 1.5 of NI 43-101;

13) I have had no prior involvement with the property that is the subject of this Technical Report; and

14) I have read NI 43-101 and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of August 27th, 2013, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 11th day of October 2013.

Original signed and sealed

(Signed) "Charles H. Cauchon"

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Charles H. Cauchon, Eng.
General Manager – Mining Group
Met-Chem Canada Inc.

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Appendix A – Detail Flow Sheets and Layouts

1.0 SUMMARY

1.1 Introduction

Rockex Mining Corporation is undertaking to continue the evaluation of its Lake St. Joseph Iron Property (the "**Property**") which is located 100 km NE of Sioux Lookout, Ontario. To that end, Rockex completed additional core drilling on the Property, in 2011-2012, in order for Met-Chem to prepare an updated Canadian National Instrument 43-101 Technical Report ("**NI 43-101**") compliant mineral resource estimate and proceed with a Preliminary Economic Assessment ("**PEA**"). Rockex' Property includes 17 contiguous claims covering iron formation that appears to extend over the full width of the Property. However, the present Study is based on mineral resources within Eagle Island, which contains the portion of the known iron formation where sufficient data is available to define the continuity of geology and grade for the purposes of a mineral resource estimate.

A block model was created using MineSight® software package. Variograms were generated in order to analyse the spatial continuity of the mineralization and determine the parameters for grade interpolation. The resources of the Eagle Island deposit were estimated at a cut-off of 10% iron and using the Inverse Distance Squared Method ("**IDW2**") but the anisotropy of the search ellipsoid was taken into account. The resource classification follows the guidelines adopted by the Council of the Canadian Institute of Mining Metallurgy and Petroleum ("**CIM**") and of NI 43-101. The Indicated Resources are estimated at 1,287 Million Metric Tonnes ("**Mt**") at a grade of 28.39% Fe and the estimated Inferred Resources amount to 108 Mt grading 31.03% Fe.

Process flow sheets were developed from a recent metallurgical testing program performed by SGS Mineral Services – Lakefield ("**SGS**"). The capital cost and the operating cost estimates have been developed for a target of producing 6 Mt of pellet feed per year.

The economic analysis of the Project based on producing 6 Mtpy of pellet feed for 30-year, shows a pre-tax Net Present Value ("**NPV**") $ 2.2 billion at 8% discount rate for sales at US$105/tonne pellet feed FOB Sioux Lookout and $ 3.9 billion at 5% discount rate. The pre-tax Internal Rate of Return ("**IRR**") is 20.7% with a 4.2 year payback period. The after-tax analysis shows an NPV $1.5 billion at 8% discount rate for sales at $105 USD/tonne pellet feed FOB Sioux Lookout and $2.8 billion at 5% discount rate. The after-tax IRR is 18.1% with a 4.4 year payback period. All economic analyses are based on an initial investment of $1,559 M and sustaining investment of $609 M.

The following is a summary of the main findings of the Technical Report on the PEA.

1.2 Property Description and Ownership

Rockex' Lake St. Joseph iron Property consists of 17 contiguous mining claims covering an area of 3,616 ha. The Property is located in Patricia Mining Division, Province of Ontario, Canada, approximately 100 km NE of Sioux Lookout and 80 km SW of Pickle

Lake. The Property encompasses Eagle, Wolf and Fish Islands and covers the southwestern part of Lake St. Joseph. Rockex acquired the claims from Pierre Gagné in 2008. The claims are currently active and Rockex is the 100% recorded holder of all 17 claims. The Property is subject to a 2% royalty of the gross sale of any and all minerals mined and processed for their iron content or, starting in 2012, an annual advance royalty in the event that there is no commercial production from the Property. A 2% Net Smelter Returns royalty ("**NSR**") is payable on commencing of commercial production. Advanced royalty payments shall be credited against the NSR.

1.3 Geology and Mineralization

The Property is situated in the Lake St. Joseph Archean greenstone belt of the Uchi Subprovince of the Canadian Shield. In the Lake St. Joseph area, volcanic rocks are overlain by a suite of clastic and chemical sedimentary rocks that form the Eagle Island assemblage, which hosts the iron formation on the Property.

The Lake St. Joseph mineralization is considered to be iron formation of the Algoma-type, although the iron formation units are interlayered with beds of sedimentary rocks. The iron formation occurs as an east-west trending, steeply plunging syncline refolded in a pair of sub-parallel anticlines on Eagle Island. The iron formation extends from Eagle through Fish and Wolf Islands, and further west across the Property.

The iron mineralization consists of a fine-grained, massive mixture of specular hematite and magnetite or of well-banded magnetite beds containing very little hematite component alternating with quartz-chert beds. The ratio of hematite to magnetite in the iron formation may vary in different parts of the Property. The gangue consists of sericite, biotite, chlorite, carbonate with some hornblende and apatite. Some layers contain minor pyrite or pyrrhotite, but the sulphide content of the iron formation is generally sparse in the current mineral resource area.

1.4 Status of Exploration, Development and Operations

The Property is at a relatively advanced stage of development, with sufficient exploration and drilling data for the iron mineralization in the Eagle Island area to support a mineral resources estimate that formed the basis of the present PEA. No production of iron mineralization has been reported for the Property.

1.5 Mineral Resource Estimate

The updated mineral resource estimate by Met-Chem included the data from the drill holes completed in 2008 and 2011-2012 that were not available to Watts, Griffs and McOuat ("**WGM**"). The geological interpretation and 3D model was updated accordingly. The estimate was done in accordance with NI 43-101 regulation and the guidelines on the resource classification adopted by the Council of the Canadian Institute of Mining, Metallurgy and Petroleum (November 2010).

The database included a combination of assays for soluble iron performed by acid digestion and titration (Algoma's 1974-1978 drill holes) and total iron determination by meta-borate fusion and XRF analysis.

Rockex re-sampling program designed to validate the data generated by Algoma showed that the two (2) methods gave the same results, which allowed Met-Chem to include the older data in to the database for use in the resource estimate.

Variograms were generated in order to analyse the spatial continuity of the mineralization and determine the suitable parameters for grade interpolation. Met-Chem created a regression model between density and the iron content and assigned these values to the block model.

A block model was created using MineSight® software package to generate a grid of regular blocks for estimating tonnes and grades. Regular 50 m by 50 m by 10 m block sizes were used.

The resources of the Eagle Island deposit were estimated using the Inverse Distance Squared Method ("**IDW2**"), and are reported to a cut-off grade of 10% Fe and are not constrained to a pit.

The resource was estimated for the portion of the iron formation located on Eagle Island and is summarized in Table 1.1.

Table 1.1 – Rockex Lake St. Joseph Property, Eagle Island Deposit – Summary of the Mineral Resources (Cut-Off of 10% Fe)

Category	Tonnage (Mt)	Fe (%)
Indicated	1,287	28.39
Inferred	108	31.03

The estimate of Mineral Resource may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues. However, Met-Chem is not aware of any known issues that would materially affect the mineral resource.

The estimate for the tonnage and grade of Inferred Resources is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration.

However, it is important to note that the estimated resources in the Inferred category for the Property only represent a small percentage (7.7%) of the total resources.

1.6 Mining Methods

Met-Chem evaluated the potential for an open pit mine at Eagle Island to produce 6 Mt of iron pellet feed per year. The Mineral Resources used for the PEA are based on the resource estimation completed by Met-Chem which is discussed in this Report.

Since this Study is at a PEA level, NI 43-101 guidelines allow Inferred mineral resources to be used in the optimization and mine plan.

The mining method selected for the Project is a conventional open pit drill and blast operation with rigid frame haul trucks and hydraulic shovels. Vegetation, topsoil and overburden will be stripped and stockpiled for future reclamation use. The mineralization and waste rock will then be drilled, blasted and loaded into haul trucks with hydraulic shovels. In order to access the pit, a 1.3 km long causeway will be constructed to connect the south shore of Lake St. Joseph to Eagle Island. A series of dykes will also be constructed to permit dewatering of the dyked area to provide access to the mineral resources that lie beneath the lake.

The pit design and mine plan were limited to a 30-year mine life for the PEA, even though there are sufficient mineral resources for a longer period. The 30-year pit that has been designed for the Eagle Island deposit is approximately 2,000 m long and 900 m wide at surface with a maximum pit depth of 400 m.

The pit includes 512 Mt of Mineral Resources with an average Fe grade of 28.9% and has a strip ratio of 0.51:1 with 26 Mt of overburden and 233 Mt of waste rock. Only 1.4% of the Mineral Resources contained within the pit are in the Inferred category.

A production schedule (mine plan) was developed for the Eagle Island Project to produce 6 Mt of iron pellet feed per year. Using the mill recovery of 80% and a targeted pellet feed grade of 66.3% results in an average run of mine feed of 17.3 Mt per year at an average Fe grade of 28.9%.

The pit will be developed in three (3) phases in order to delay the dyke construction and lake dewatering. In phase 1 (years 1 to 2), the mine can be operated without the need for dyking. Phase 2 (years 3 to 8) requires a short temporary dyke and Phase 3 (years 9 to 30) requires the final dyke.

The fleet of equipment will include 14 rigid frame haul trucks (218 tonnes payload), two (2) hydraulic excavators (70 tonnes bucket), two (2) drills as well as a fleet of support equipment and service vehicles.

1.7 Recovery Methods

Test work program was undertaken at SGS Lakefield and the summarized flow sheet is therefore presented in this Report. Run of mine ("**ROM**") material is crushed using gyratory crusher before being hauled to the concentrator plant. Met-Chem has included the use of standard SAG mill with screening to produce a P_{80} of 1,700 µm. The SAG mill screen undersize is pumped to three (3) parallel closed-loop ball mill circuits. The cyclone overflow of each ball mill circuit, with a P_{80} of 88 µm, is pumped to three (3) gravity separation circuits each composed of two (2) stages of spiral gravity separators, rougher and cleaner.

The rougher tails are final tails. The rougher concentrate is fed to the cleaner spirals. The cleaner concentrate is a final concentrate. The cleaner tailings are pumped to the tertiary grinding circuits to liberate magnetite particles that are associated with silica.

Tertiary grinding circuits include two (2) closed-loop ball mill circuits with cyclones. The cyclones overflow, with a P_{80} of 27 µm, is directed to low intensity rougher and cleaner magnetic separators ("**LIMS**"). The concentrate from the rougher and cleaner LIMS is directed to a final stage of grinding. As a final liberation step, the finisher ball mill operates in closed circuit with cyclone. The cyclone overflow, with a P_{80} of 18 µm, is further concentrated by low intensity finisher magnetic separators and is pumped to a desliming thickener. The magnetite concentrate from desliming thickener underflow is a final concentrate and is pumped to the final concentrate (pellet feed) thickener.

It is to be noted that the concentrator product is a concentrate however if it is fine enough to the fed directly to a pellet plant without further grinding it is generally called pellet feed. Generally concentrate will be used in description of the test work, flow sheet and concentration processes up to the final concentrate.

The cleaner and finisher LIMS tails contains unliberated iron oxides. The slurry is conditioned and fed to the primary desliming thickener which separates liberated silicates from the iron oxides via differential settling rates. The silicates, otherwise known as the 'slimes', report to the thickener overflow and are pumped to final tailings, while the denser iron oxides settle out and report to the thickener underflow. The underflow is fed to closed circuit pebble mill. The pebble mill further liberates silicates from the iron oxide particles. The cyclone overflow has a P_{80} of 18 µm and reports to the final three (3) desliming thickeners. Each stage removes further 'slimes' which further upgrades the iron oxides which reports to the underflow. The concentrate is pumped to the final concentrate (pellet feed) thickener.

The spiral, magnetic and desliming iron concentrate (pellet feed) is thickened to 65% solids and pumped through a pipeline to Sioux Lookout. The Sioux Lookout facility consists of a thickener, two (2) slurry storage tanks, two (2) filters and two (2) dryers that are used only during the freezing months. The pellet feed is moved by conveyor to the pellet feed storage facility.

An overhead tripper conveyor creates an iron pellet feed stockpile of 60,000 tonnes representing slightly over three (3) days of nominal operation. This will be stored in a covered facility. The pellet feed is reclaimed by a drum type reclaimer. The reclaimed pellet feed is transported from the stockpile to the car loader by a conveyor system.

1.8 Other Infrastructure

The construction at the site will also require the development and construction of:

- A series of dykes to dewater the mineral resources that lie beneath the lake;
- Causeway from main land to Eagle Island;
- Roads at site and Sioux Lookout and railway loop at Sioux Lookout;
- Natural gas at Sioux Lookout and power lines at both sites, and associated facilities;
- Permanent and temporary on-site housing facilities;
- Water treatment plants (incoming and outgoing);
- Waste rock and top soil deposition;
- Maintenance facilities at each site;
- Sewage disposal facility and landfill;
- Slurry pipeline.

1.9 Capital and Operating Costs

The capital cost estimate of the Rockex Project is based on Met-Chem's standard methods applicable for a Preliminary Economic Assessment study to achieve the accuracy level of ± 35%.

The initial capital cost for the scope of work is estimated as $1,559 M including $1,155 M for direct costs and $404 M for indirect costs including contingency (all monetary figures in CAD unless otherwise noted). The total life of mine capital cost is estimated at $2,168 M of which $1,559 M is initial capital and $609 M is sustaining capital.

The sustaining capital cost covers closure and rehabilitation of the site and replacement of mine fleet equipment as well as costs related to the construction of the dykes and tailings storage facility to their final design. Also, some provisions cover improvement of process during the mine life and infrastructure in the first 10 years. The capital cost is summarized in Table 1.2.

Table 1.2 – Summary of Life of Mine Costs Estimate (6 Mtpy Pellet Feed)

Item Description	Initial Capital (Total Rounded) ($M)	Sustaining Capital (Total Rounded) ($)	Total Capital (Total Rounded) ($)
Direct Costs			
Open Pit Mine	137.2	292.1	429.3
Process at Mine Site	461.4	15.0	476.4
Tailings and Water Management	40.4	45.2	85.6
Concentrate Pipeline	139.5		139.5

Item Description	Initial Capital (Total Rounded) ($M)	Sustaining Capital (Total Rounded) ($)	Total Capital (Total Rounded) ($)
Power, Communication Mine Site	94.2		94.2
Main Road, Helicopter Pad	11.8		11.8
Permanent Camp at Mine Site	11.5		11.5
Infrastructure Mine Site	40.1	12.0	52.1
Causeway to Eagle Island	12.1		12.1
Dykes around Eagle Island		170.0	170.0
Process at Sioux Lookout Site	112.1	5.0	117.1
Power, Communication S-L Site	9.3		9.3
Railroad Facilities S-L Site	4.3		4.3
Infrastructure S-L Site	13.8	4.0	17.8
Natural Gas Pipeline to S-L Site	67.0		67.0
Total Direct Costs	**1,154.7**	**543.3**	**1,698.0**
Indirect Costs	173.2		173.2
Closure and Rehabilitation		65.7	65.7
Contingency	230.9		230.9
Total Capital Costs	**1,558.8**	**609.0**	**2,167.8**

The life of mine average operating cost was estimated at $36.63 per tonne of pellet feed produced as shown on Table 1.3. The mining cost is estimated at $12.76 per tonne of pellet feed. The concentrator plant cost is estimated at $18.05 per tonne of pellet feed.

The Sioux Lookout area (dewatering and drying) cost is estimated at $1.83 per tonne of pellet feed. The Railroad area cost is estimated at $0.20 per tonne of pellet feed. The G&A and site services cost is estimated at $3.79 per tonne of pellet feed.

Table 1.3 – Summary of Life of Mine Average Operating Cost Estimate

Area	Average Operating Cost ($/Tonne of Pellet Feed)
Mining	12.76
Concentrator Plant	18.05
Sioux Lookout Area	1.83
Railroad	0.20
General & Administration and Site Services	3.79
Total Operating Costs	**36.63**

1.10 Financial Reviews

The economic/financial analysis of the Eagle Island Project is based on third-quarter-2013 price projections and cost estimates. No provision is made for the effects of inflation. An exchange rate of USD 0.95 per CAD is assumed to convert USD prices into CAD. The evaluation is carried out on the basis of unlevered cash flows. Current Canadian tax regulations are applied to assess corporate tax and Ontario mining tax liabilities of the Project. The financial analysis incorporates the royalty payment agreement.

The Project's financial indicators for base case conditions are presented in Table 1.4.

Table 1.4 – Financial Indicators

Financial Indicator	Pre-Tax	After-Tax
Payback Period (years)	4.2	4.4
Net Present Value @ 8% ($ M)	2,217.2	1,533.7
Internal Rate of Return (%)	20.7	18.1

A sensitivity analysis reveals that the Project's viability is not significantly vulnerable to variations in capital and operating costs, within the margins of error associated with PEA study estimates. However, the Project's viability remains more sensitive to the fluctuation on future prices.

1.11 Conclusions and Recommendations

1.11.1 Geology

The exploration and drilling data available for the portion of the iron formation located on Eagle Island are sufficiently complete and adequate to support the estimation of the mineral resources that served as the basis of the present PEA. The Indicated Resources of the present estimation are adequate for the purposes of a pre-feasibility study. The resources in the Inferred category cannot be used in a pre-feasibility study, but they only represent a small percentage (7.7%) of the total resources.

1.11.2 Mining

The following activities should be considered to support a pre-feasibility study:

- A more detailed survey should be carried out to determine the topographic elevations on Eagle Island, the thickness of overburden and the elevation of the lake bottom.
- Geotechnical and hydrogeological studies should be performed to further confirm rock slopes, rock permeability, ground and underground water flows in order to validate the open pit mining technical parameters.
- The maximum lake elevation should be reconfirmed with Ontario Hydro since the current letter dates from 1969.

- An in-depth geotechnical study should be carried out to validate the dyke design parameters.

1.11.3 Process

To improve the iron recovery while maintaining the iron content above 65% and SiO_2 below 5%, the following test work studies are to be optimised:

- Gravity Circuit, test the feed material at either coarser grind size or test with a low sloped spirals designed for finer size distributions;
- Desliming Circuit, test work needs to investigate the benefits of more recent reagents;
- Grinding Circuit, improvements in grinding efficiency can be achieved by investigating replacing SAG mills by HPGRs and by replacing the ball mills by vertical attrition grinding mills (i.e. tower mills).

The following test work should be included in the next stage of pre-feasibility and feasibility:

- Lock-Cycle Test Work;
- Pilot Plant Test Work;
- Comminution Test Work (i.e. JK drop weight test work on the main composite with SAG Mill Comminution ("**SMC**") tests on the lithologies of the deposit);
- Concentrate Slurry Transport Test Work;
- Concentrate and Pellet Feed Settling Test Work;
- Pellet Feed Filtration Test Work;
- Balling Design Parameter Test Work (i.e. green pellet chemical analysis, green pellet physical analysis);
- Pot Grate Design Parameter Test Work (i.e. pre-heating [drying] time/temperature, induration [cooking] time, optimal hearth layer thickness);
- Wet High Intensity Magnetic Separation ("**WHIMS**") (i.e. testing of the tails from the LIMS circuit with a high intensity type of separation equipment such as a SLON);
- Hydraulic Separation Test Work (i.e. hydraulic classifier or a reflux classifier).

2.0 INTRODUCTION

2.1 Terms of Reference – Scope of Work

Rockex Mining Corporation ("**Rockex**") is a publicly held company trading on the Toronto Stock Exchange under the symbol RXM, which has undertaken the continued review of its Lake St. Joseph Iron Property, which is located 100 km NE of Sioux Lookout, Ontario. Rockex' Property includes 17 contiguous claims covering iron formation that appears to extend over the full width of the Property. However, the present Study is based on mineral resources within Eagle Island, which contains the portion of the known iron formation where sufficient data is available to define the continuity of geology and grade for the purposes of a mineral resource estimate.

Rockex has mandated Met-Chem to complete a Canadian National Instrument 43-101 Technical Instrument ("**NI 43-101**") compliant Preliminary Economic Assessment ("**PEA**") for the Property in order to advance the Project.

Rockex has drilled an additional 16 drill holes on Eagle Island since the last resource estimate by Watts, Griffs and McOuat ("**WGM**") (2011). These holes, with the five (5) twin holes drilled in 2008 and excluded from WGM's calculations, were successful in increasing the total tonnage and upgrading resource classification.

This Report has been completed in compliance with NI 43-101. The capital and operating cost estimates, schedule and financial reviews have been completed as per the industry standard.

2.2 Source of Information

2.2.1 Contributing Authors

This Report was completed through the efforts of two (2) companies and individuals:

WGM completed a block model and resource estimate for this Property in 2011. However, Met-Chem has updated WGM's geological interpretation with new data, generated variograms and a new block model. Met-Chem performed a reasonable amount of verifications of the results provided in their report and has largely drawn from the text of their report for Sections 4 through 12.

2.2.2 Qualified Persons

The main qualified persons responsible for the development of this Report are Yves A. Buro, Eng., Schadrac Ibrango, P. Geo., Ph. D., Jeffrey Cassoff, Eng., Ryan Cunningham, Eng., Alain Michaud, Eng., Mary-Jean Buchanan, Eng., M. Env., Michel L. Bilodeau, Eng., M. Sc. (App.), Ph. D., Costinel Calota, Eng. and Charles Cauchon, Eng., all with Met-Chem Canada Inc.

Table 2.1 provides a list of qualified persons and their respective sections of responsibility. The certificates for people listed as Qualified Persons can be found at the beginning of the Report under Date and Signature – Certificates.

Table 2.1 – Qualified Persons and their Respective Sections of Responsibility

Section	Title of Section	Qualified Persons
1.0	Summary	Charles Cauchon and related QPs
2.0	Introduction	Charles Cauchon and related QPs
3.0	Reliance on Other Experts	Charles Cauchon and related QPs
4.0	Property Description and Location	Yves A. Buro, Met-Chem
5.0	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Yves A. Buro, Met-Chem
6.0	History	Yves A. Buro, Met-Chem
7.0	Geological Setting and Mineralization	Yves A. Buro, Met-Chem
8.0	Deposit Types	Yves A. Buro, Met-Chem
9.0	Exploration	Yves A. Buro, Met-Chem
10.0	Drilling	Yves A. Buro, Met-Chem
11.0	Sample Preparation, Analyses and Security	Yves A. Buro, Met-Chem
12.0	Data Verification	Yves A. Buro, Met-Chem
13.0	Mineral Processing and Metallurgical Testing	Ryan Cunningham, Met-Chem
14.0	Mineral Resource Estimates	Schadrac Ibrango, Met-Chem
15.0	Mineral Reserve Estimates	Not used
16.0	Mining Methods	Jeffrey Cassoff, Met-Chem
17.0	Recovery Methods	Ryan Cunningham, Met-Chem
18.1	Project Infrastructure – Mine and Concentrator	Costinel Calota, Met-Chem
18.2	Project Infrastructure – Power Sioux Lookout, Filtering, Drying and Shipping	Costinel Calota, Met-Chem
18.3 to 18.16	Project Infrastructure – Concentrate Pipeline to Batch Plants	Charles Cauchon, Met-Chem
19.0	Market Studies and Contracts	Charles Cauchon, Met-Chem
20.0	Environment Studies Permitting and Social or Community Impact	Mary-Jean Buchanan, Met-Chem
21.1	Capital Costs	Alain Michaud, Met-Chem
21.2	Operating Costs	Charles Cauchon and related QPs
22.0	Economic Analysis	Michel L. Bilodeau, Met-Chem
23.0	Adjacent Properties	Yves A. Buro, Met-Chem
24.0	Other Relevant Data and Information	Charles Cauchon, Met-Chem
25.0	Interpretation and Conclusions	Charles Cauchon and related QPs
26.0	Recommendations	Charles Cauchon and related QPs
27.0	References	

2.3 Site Visit

A visit to the site was carried out by Yves A. Buro, Eng., Geologist, Jeffrey Cassoff, Eng., Mining Engineer and Charles Cauchon, Eng., Metallurgist, of Met-Chem, on June 16, 17 and 18, all of whom are qualified persons ("**QP**") by the terms of NI 43-101 and have contributed to this Report.

A series of drill sites from the 2008 and 2011-2012 programs were visited on Eagle Island. Various documents were examined at the Rockex' office in Thunder Bay and drill core was checked against the entries in the database. The coarse rejects from 18 samples in three (3) drill holes were selected by the QP and analyzed. These analytical results from these independent check samples confirmed the original values. The site visit included the port area in Thunder Bay and various potential sites for the establishment of infrastructures.

No factors that could compromise the reliability of the resources estimate or the completion of the required work was observed during the site visit.

2.4 Units and Currency

In completing this Report, the following terms of reference apply:

- All units of measurement are in the metric system, unless otherwise noted;
- All costs, revenues and financial reviews have been completed in Canadian Dollars ("**CAD**");
- All metal prices have been quoted in US Dollars, unless otherwise noted;
- An exchange rate of USD 0.95/ CAD 1.00 has been used in all analysis;
- Discount rates of 5% and 8% have been employed for the reviews.

Other standards are specified, as necessary, in individual sections.

2.5 Abbreviations

Abbreviations used in this Report are listed in Table 2.2.

Table 2.2 – List of Abbreviations

Abbreviation	Description
°C	Celsius
μm	Microns
-150 mesh	Minus 150 mesh
3D	Three Dimensional
$/m^2	Dollar per Square Meter
$/m^3	Dollar per Cubic Meter
$/t	Dollar per Tonne
ARD	Acid Rock Drainage

Abbreviation	Description
ASL	Above Sea Level
BIF	Banded Iron Formation
BOF	Basic Oxygen Furnace
Buchanan	Buchanan Forest Products
BWi	Bond Ball Work Index
CAD or $	Canadian Dollar
CDE	Canadian Development Expenses
CEAA	Canadian Environmental Assessment Act
CEE	Canadian Exploration Expenses
CEPA	Canadian Environmental Protection Act
cfm	Cubic Feet per Minute
CFR	Cost and Freight
CIF	Cost Insurance and Freight
CIM	Canadian Institute of Mining , Metallurgy and Petroleum
CIS	Commonwealth Independent States
cm	Centimeter
COV	Coefficient of Variation
CRM	Certified Reference Materials
Cygnus	Cygnus Consulting Inc.
DFO	Department of Fisheries and Oceans
DRI	Direct Reduced Iron
DT	Davis Tube
EAF	Electric Arc Furnace
EPCM	Engineering Procurement Construction Management
Essar	Essar Steel Holdings Ltd.
Fe	Iron
FOB	Free on Board
ft	Feet
FVNR	Full Voltage Non Reversable
G&A	General and Administration
H_2	Hydrogen
ha	Hectare
HBI	Hot Briquetted Iron
HDPE	High Density Polyethylene
HmFe	Hematitic Iron

Abbreviation	Description
hp	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
ID	Identification
IDW	Inverse Distance Method
IDW2	Inverse Distance Squared Method
IRR	Internal Rate of Return
kg	Kilogram
kg/t	Kilogram per Tonne
km	Kilometers
kV	Kilovolt
kW	Kilowatt
kWh/t	Kilowatt Hour per Tonne
L	Liter
LIMS	Low Intensity Magnetic Separator
LOI	Loss on Ignition
LOM	Life of Mine
LSJI	Lake St. Joseph Iron Ltd.
LV	Low Voltage
m	Meters
M	Million
m^2	Square Meter
m^3	Cubic Meter
m^3/h	Cubic Meter per Hour
m/h	Meter per Hour
MagFe	Magnetic Iron
MCC	Motor Control Centre
MENA	Middle East and North Africa
min	Minutes
min/h	Minutes per hour
min/shift	Minutes per shift
mm	millimeter
Mm^3	Millions of Cubic Meter
MNDM	Ministry of Northern Development and Mines
MNR	Ministry of Natural Resources Wildlife
MOE	Ministry of Environment
MOU	Memorandum of Understanding

Abbreviation	Description
Mt	Millions of Metric Tonnes
Mtpy	Millions of Metric Tonnes per Year
MV	Medium Voltage
MVA	MegaVolt-Ampere
MW	Megawatt
MWh/d	Megawatt Hour per Day
MZ	Main Zone
NAG	Non Acid Generating
NAN	Nishnawbe-Aski Nation
NE	North East
NI 43-101	Canadian National Instrument 43-101
NPV	Net Present Value
NSR	Net Smelter Returns
NTS	National Topographic System
NW	North West
ORF	Ontario Research Foundation
PEA	Preliminary Economic Assessment
PF	Power Factor
ph	Phase (Electrical)
QA/QC	Quality Assurance /Quality Control
QP	Qualified Person
ROM	Run of Mine
RQD	Rock Quality Designation
S	Sulfur
SAG	Semi-Autogenous Grinding Mill
SCIM	Squirrel Cage Induction Motors
SE	South East
SEZ	South East Zone
SG	Specific Gravity
SGS	SGS Mineral Services – Lakefield
S-L	Sioux Lookout
SMC	SAG Mill Comminution
SolFe	Sulfate Ferrous
SPI	SAG Power Index
SW	South West
t or Tonnes	Metric Tonnes

Abbreviation	Description
t/m^3	Metric Tonnes per Cubic Meter
TIN	Triangulated Irregular Network
TotFe	Total Iron
tpd	Metric Tonnes per Day
tph	Metric Tonnes per Hour
tpm	Metric Tonnes per Month
tpy	Metric Tonnes per Year
UMEX	Union Minière Exploration
USA	United Stated of America
USD or US$	US Dollar
UTM	Universal Transverse Mercator
V	Volt
VFD	Variable Frequency Drive
WGM	Watts, Griffis and McOuat
WHIMS	Wet High Intensity Magnetic Separation
WSD	World Steel Dynamics

3.0 RELIANCE ON OTHER EXPERTS

Met-Chem has largely drawn from the technical report on the mineral resource estimate of the Lake St. Joseph Project prepared by Watts, Griffis and McOuat ("**WGM**") dated January 28, 2011. Met-Chem relied on the information provided in the report and the opinions expressed by WGM, a reputable firm with a strong background in this area of expertise. However, Met-Chem has made a fair amount of verification to reasonably rely on the information. The resources estimated by WGM have been completely updated by Met-Chem, using drill data generated after WGM's estimate.

For information that is outside of the area of its technical expertise:

- Met-Chem has checked the status of the claims on the Ontario Northern Development and Mines website but has not researched legal ownership information. The information on the mining and surface rights over the Property was provided by Rockex (Section 4.2 of this Report).
- Met-Chem has not checked the legal aspect of the royalty payments due by Rockex. The information was provided by Rockex (Section 4.2 of this Report).
- There was no environmental review carried out under Met-Chem and the limited relevant information already available is described in the Report.
- The QP has relied on fiscal information for use in the after-tax economic evaluation of Lake St. Joseph Project by Mr. Christopher Jacobs, CEng MIMMM of Micon International Limited. The QP has reviewed the information and the results provided by Mr. Jacobs and believes this information to be correct and adequate for use in the PEA. The results of the post-tax economic evaluation have been used in the financial projections of Section 22 of this Report.

Met-Chem's estimates are based on methodologies and procedures consistent with accuracy levels as stated in the Report.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

The Property is located in the Trist Lake Area, Patricia Mining Division, Sioux Lookout District, Province of Ontario, Canada. The Property encompasses Eagle, Wolf and Fish Islands and covers the southwestern part of Lake St. Joseph, (Figure 4.1).

The Property lies approximately 100 km northeast of Sioux Lookout and 80 km southwest of Pickle Lake. It is centered at approximately at 91°05'E longitude and 50°58'N latitude, on the boundary between National Topographic System ("**NTS**") map sheets 52O and 52J.

4.2 Property Description and Ownership

Rockex' Lake St. Joseph Property consists of 17 contiguous mining claims covering an area of 3,616 ha (Figure 4.2). Six (6) claims underlain by granitic rocks on the south of the original Property were recently released by Rockex.

In 2006, the claims of the Property that was owned by Dofasco were allowed to lapse. Pierre Gagné staked the 23 claims in 2007 and Rockex, formerly Enviropave International Ltd., acquired them in 2008.

All the claims are within the Trist Lake Area, Patricia Mining Division, are active and Rockex Mining Corporation is the 100% recorded holder of the 17 claims. The Property has not been legally surveyed. Details on the claims are presented in Table 4.1.

Figure 4.1 – Site Location Map

Figure 4.2 – Claim Map

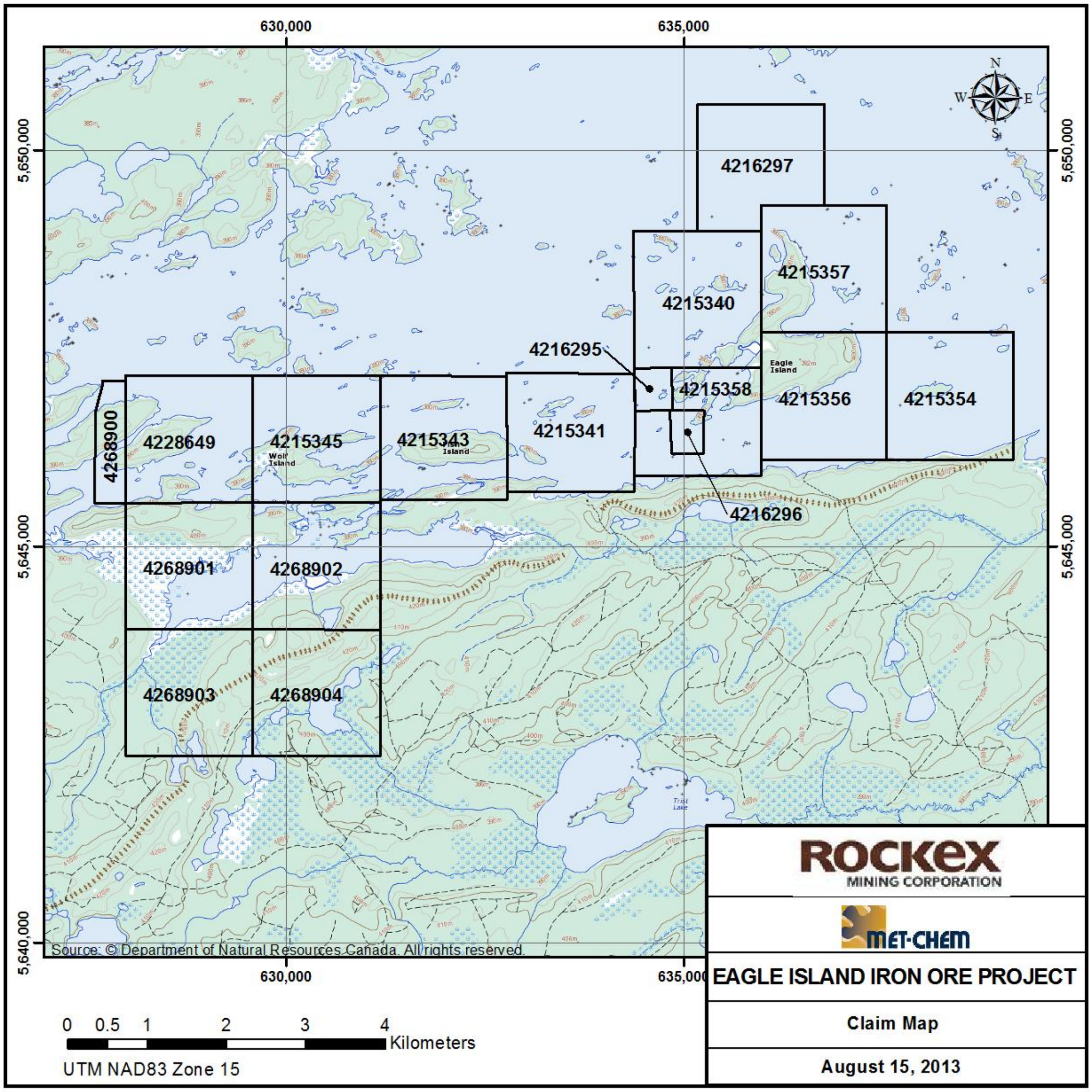
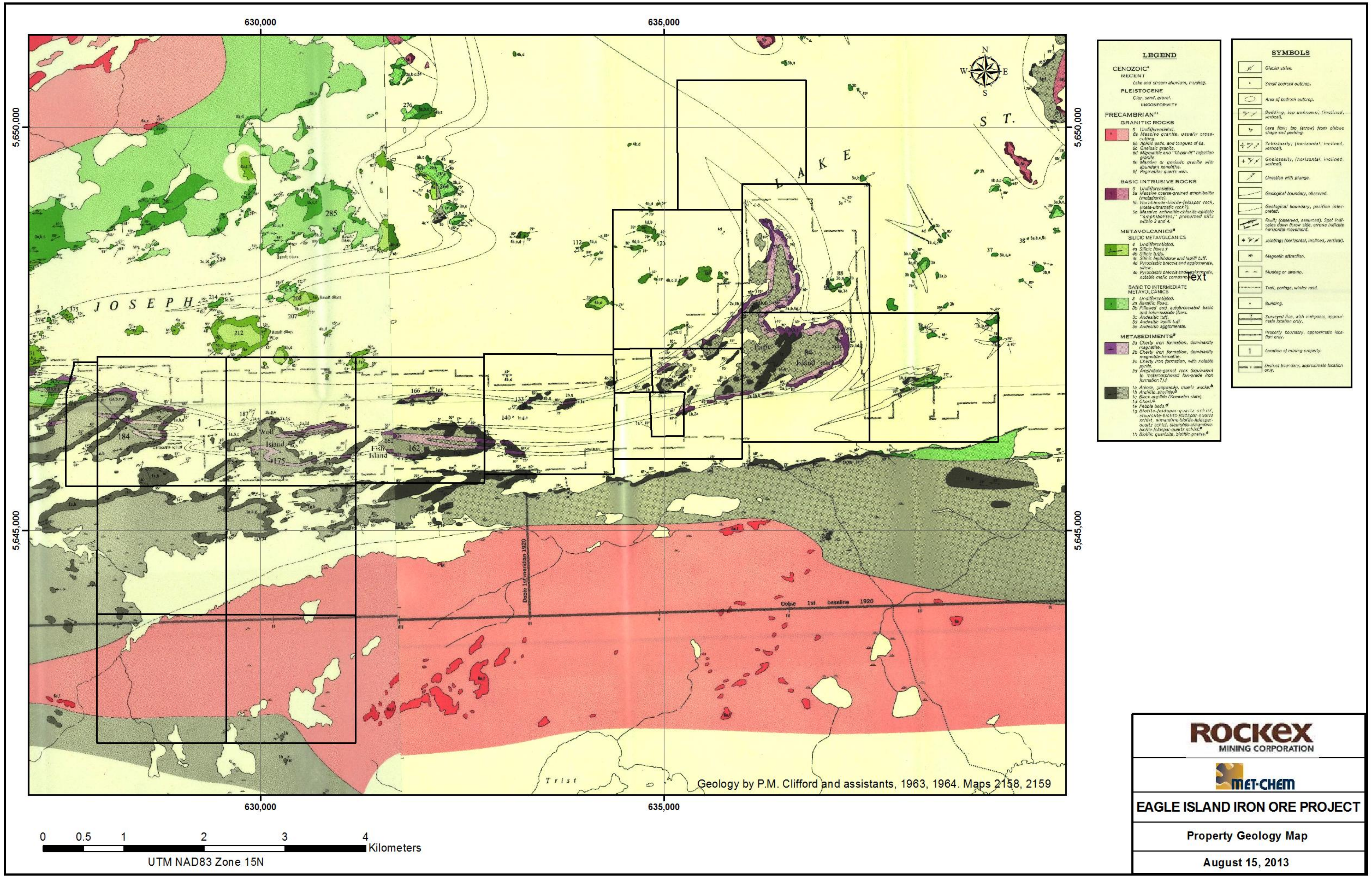


Table 4.1 – List of Claims for Rockex' Lake St. Joseph Property

Claim Number	Recording Date	Claim Due Date	Work Required	Total Applied	Total Reserve
4215340	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$475,662
4215341	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$0
4215343	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$418,619
4215345	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$0
4215354	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$0
4215356	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$1,864,171
4215357	2007-Apr-13	2016-Apr-13	$6,400	$44,800	$996,797
4215358	2007-Apr-13	2016-Apr-13	$5,200	$36,400	$104,937
4216295	2008-Aug-15	2016-Aug-15	$400	$2,400	$2,567
4216296	2008-Aug-15	2016-Aug-15	$400	$2,400	$2,636
4216297	2010-Jul-02	2016-Jul-02	$6,000	$24,000	$0
4228649	2008-Jan-28	2014-Jan-28	$6,400	$25,600	$0
4268900	2012-Feb-14	2014-Feb-14	$1,600	$0	$0
4268901	2012-Feb-14	2014-Feb-14	$6,400	$0	$0
4268902	2012-Feb-14	2014-Feb-14	$6,400	$0	$0
4268903	2012-Feb-14	2014-Feb-14	$6,400	$0	$0
4268904	2012-Feb-14	2014-Feb-14	$6,400	$0	$0

The claims include the Eagle Island Deposit, as well as additional iron formation at Wolf Island and Fish Island (Figure 4.3).

Figure 4.3 – Property Geology Map



The major islands (Eagle, Fish and Wolf) contained within the Property's perimeter are covered by surface rights (Freehold Patents). Two (2) of these (PA17201 and PA17202) covering Island 184 are owned by Rockex while the others are not. A tourist operator owns the surface rights of a substantial part (but not all) of Eagle Island and another landowner owns the surface rights of part of Fish Island and Wolf Island. The coverage and extent of some of these surface patents is not completely clear. Excluded from the Property is one (1) claim (PA17195), surrounded by Rockex's holdings and is classified as a Freehold Patent located on west edge of the Property. This claim is held by Essar Steel Algoma Inc. and it includes both surface and mineral rights.

A mining claim is a square or rectangular area of open Crown land or Crown mineral rights that can range in size from 16 ha (a 1-unit claim) to 256 ha (a 16-unit claim). A claim is a mineral right that gives its holder the exclusive right to explore a designated territory for any mineral substance that is part of the public domain, except for loose surficial deposits of gravel, sand and clay. The holder of a mining claim does not have the surface rights of the claim. However, a claim owner has the right to enter, use and occupy the claim for the purpose of prospecting and the efficient exploration, development and operation of the mines, minerals and mining rights. Rockex owns the surface rights for the two (2) aforementioned patents.

To maintain a claim in good standing, approved exploration work must be completed and filed with the Ontario Ministry of Northern Development and Mines ("**MNDM**"). Work to a value of $400 per year is required per claim unit, except for the first year, when no assessment work is required. Assessment work must be performed and applied to each of the mining claims until the holder applies for a Mining Lease.

On April 1, 2013, the new regulations under Ontario's Mining Act came into effect. Changes have been made as an attempt to promote mineral exploration in a manner that recognizes Aboriginal rights, is more respectful of private landowners and minimizes the impact of mineral exploration and development on the environment. Some of the changes include:

- Sites of cultural significance for Aboriginal communities may be withdrawn from claim staking.
- Exploration plans for early exploration activities are to be submitted in advance and any surface-rights owners are to be notified. Additionally, any Aboriginal groups potentially affected by the exploration activities will be notified by the MNDM and will have an opportunity to provide feedback.
- Mining companies will be required to obtain permits in advance of certain activities (i.e. drilling with equipment heavier than 150 kg). Permit applications will be subject to approval by the MNDM and will require consultation with Aboriginal groups.
- Aboriginal consultation is now required prior to the submission of a certified closure plan or amendment.

Rockex has applied for the permits that would be required in case additional drilling will be completed, and those permits are being processed by the MNDM. Considerably more surface rights will be required for mine development and plant location and ancillary services.

4.3 Issuers Interest

The Lake St. Joseph Property is subject to certain royalties, under some conditions. An Iron Royalty Agreement of April 15, 2010 stipulates that a 2% royalty of the gross sale of any and all minerals mined and processed for their iron content is granted to P. Gagné. Starting in 2012, an annual advance royalty is payable to P. Gagné, in the event that there is no commercial production of minerals from the Property for their iron content. The advance royalty amounts to $250,000 in the first year and is increased by a compounding factor or 10% in subsequent applicable years. A Net Smelter Returns ("**NSR**") Royalty Agreement dated as of April 15, 2012 provides that P. Gagné, commencing on Commercial Production, is entitled to a royalty equal to 2% of the NSR.

Royalty payments shall be credited against the NSR and shall not be payable in any calendar year in respect of which there is commercial production of minerals from the Property for their iron content.

4.4 Legal Survey

The Property has not been legally surveyed.

4.5 Environmental Liabilities

No environmental studies or surveys were conducted by previous operators and there is no record of any environmental work conducted on the Property since that time. Baseline environmental studies were apparently started by Rockex but a full study should be part of Rockex's next exploration program. This subject is further discussed under the chapter on Environmental Studies of this Report.

4.6 Significant Factors and Risks

Two (2) Ojibway Aboriginal communities are present in the region, relatively close to the Property:

- The Mishkeegogmang First Nation, with communities located along Highway 599 at the east end of Lake St. Joseph;
- The Slate Falls First Nation community situated approximately 40 km northwest of the Property.

The Mishkeegogamang/Slate Falls First Nations' traditional lands include the Lake St. Joseph area. These lands were ceded to the Crown by treaties under certain conditions.

Met-Chem understands Rockex management has held meetings with the representatives of the Slate Falls and the Mishkeegogamang communities. Apparently, most of the discussions centered around the conduct of exploration activities by Rockex on its claims and employment opportunities that a mining operation on the Property may generate for members of the First Nation communities.

Met-Chem is not aware of any factor that may impede development of the mineral resources on Eagle Island and/or Fish Island in the future. As well, Met-Chem is not aware of any other native communities whose traditional lands would be impacted by Rockex activities on the Property.

Met-Chem strongly recommends that regular meetings be held with representatives of the First Nations and of local population to foster a good relationship, in line with the guidelines in the revised Ontario Mining Act concerning the duty to consult Aboriginal peoples and stakeholders.

Most of the information in this Section is drawn from various communications with Rockex and from descriptions in WGM's report (2011). Additional information on Aboriginal issues can be found in WGM's technical report.

Met-Chem is not aware of other significant factors, or risks that may affect access, title or the right or ability to perform work on the Property.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

The Property is currently accessed via a logging road, the Vermilion River Road, that exits Highway 516, about 30 km northeast of Sioux Lookout (Figure 4.1). This road continues northwards and branches to the northwest and to the northeast at 75 km from its junction with Highway 516. The northeast branch follows an esker to the south shore of Lake St. Joseph. Rockex's camp is located 100 m south the shoreline of Lake St. Joseph opposite Eagle Island. The drive from Sioux Lookout to the camp takes about 2.5 hours.

The road is apparently a public road from its junction with Highway 516 to km 75 and from there to the camp it is a logging road maintained under permits granted to Buchanan Forest Products ("**Buchanan**") and parent company McKenzie. The road crosses several creeks and the Ministry may require the forestry company to remove the culverts when its operations in the area are complete. Apparently, Rockex has a verbal understanding with Buchanan to use the road.

The Property and Eagle, Wolf and Fish Islands are also accessible by boat from the east end of the Lake, via Highway 599, which connects Pickle Lake to the Trans-Canada Highway at Ignace and reaches the east end of Lake St. Joseph, approximately 40 km east of the Property.

5.2 Climate

The closest weather station is located at Kenora. The Kenora area has a humid continental climate with warm summers and cold, dry winters. Mean daily summer temperatures at Pickle Lake range from 14 to 18°C, with the daily maximum average in July reaching 24°C. In January and February, mean daily temperatures are approximately -21 to -17°C. Mean annual precipitation is about 720 mm, including about 260 cm of snowfall (Table 5.1).

Although winter days can be cold and snow accumulation significant, Canadian miners are experienced operating mines under even harsher climatic conditions than the ones prevailing in the Project area.

Table 5.1 – Kenora Average Weather by Month

Month	Temperature (°C)		Average Precipitation (mm)		
	Maximum	Minimum	Daily	Monthly	Average Snow Days
January	9.1	-37.3	0.9	27.0	20
February	8.8	-41.4	0.7	18.5	17
March	16.6	-34.0	0.9	26.9	15
April	27.4	-21.0	1.4	41.9	8
May	30.2	-8.9	3.0	91.5	3
June	35.6	1.1	4.1	123.1	0
July	34.0	4.8	3.4	106.6	0
August	34.0	3.9	2.9	89.6	0
September	31.4	-2.2	3.2	95.3	1
October	25.6	-12.7	2.1	63.6	8
November	17.0	-25.0	1.4	41.7	19
December	6.3	-37.3	1.0	30.8	22

(Source: http://www.meoweather.com/)

5.3 Local Resources and Infrastructure

Pickle Lake is the closest town to the Property and it is located on Highway 599, approximately 40 km north of where the highway reaches Lake St. Joseph. The town has a nominal population of 479 that fluctuates widely on a seasonal basis. Pickle Lake was developed in the 1930s as the town site for the Pickle Crow and Central Patricia gold mines. Both these former mine sites are now part of the Township of Pickle Lake.

The Central Patricia gold mine was closed in 1951 but supported a population of 400 during its life. Production at Pickle Crow ceased in 1966, bringing to an end the boom which had started in 1935. Pickle Lake boomed once again in 1974, with the construction of Union Minière Explorations (“**UMEX**”) and Mining Corporation’s Thierry copper-nickel mine located 10 km northwest of Pickle Lake, in production between 1976 and 1982. The population, which reached a peak of 1,200 in 1981, dropped once again to around 400. In 1987, after years of exploration activities, the community once again became a boomtown.

Both Placer Dome Inc. (“**Placer Dome**”) and St. Joe Canada (“**Bond Gold**”) opened mines in the Pickle Lake area. Placer Dome constructed Dona Lake mine, 35 km northeast of Pickle Lake that was active between 1987 and 1993. The Bond Gold mine was 48 km northwest of Pickle Lake and closed in 1995. In 1996, Placer Dome opened the Musselwhite mine approximately 160 km north of Pickle Lake.

The municipality of Sioux Lookout, which includes the town of Hudson, is located approximately 110 km southwest of the Property and 80 km by road, north of the Trans-Canada Highway. Located on the Canadian National Railway, it has a population of approximately 5,500 persons. McKenzie has a saw mill in Hudson that employs about 350 people.

Road access to the Property is currently provided via a gravel road that has partial year-round access, extending north from Provincial Highway 516. The gravel road is used primarily for timber cutting and haulage north of Sioux Lookout, and is capable of handling standard road tractor-trailer combinations.

The Sioux Lookout municipal airport services scheduled and charter flights with connecting flights to over 40 destinations in Canada and the USA.

Existing rail access is approximately 80 km away (Canadian National Railway) or 160 km (Canadian Pacific Railway) from the site. In either case, a new spur line would need to be constructed to access the site to allow for regular, year-round access.

Natural gas is currently routed via the TransCanada Pipeline, which roughly follows Highway 17 in this area through Ignace, Dryden and Kenora. The closest point of contact would be approximately 100 km away, necessitating the construction of a pipeline through Sioux Lookout, and up to the site.

The nearest hydro-electric power to the Property is located at Slate Falls fed by a 115 kV transmission line. There are plans to upgrade this to a 230 kV line in the midterm (10 years). Currently this line is probably insufficient to support a substantial iron mine. For its planned operations at the east end of Lake St. Joseph, Steep Rock applied for a permit to survey a route for a power line from Raleigh (just north of Ignace on Highway 17) to its property.

The alternative of connecting to the new 230 kV power line of the Wataynikaneyap project planned for 2015 could be examined at the next phase.

The area on Eagle Island is not large enough to accommodate all of the potential processing plant, tailings storage and waste disposal sites, and some area on the mainland south of Eagle Island has to be set aside for the required infrastructures.

5.4 Physiography

Lake St. Joseph is 374 m above sea level ("**ASL**") and maximum elevation on Eagle Island is approximately 400 m ASL. Fish and Wolf Islands have slightly less topographic relief, like the area south of Lake St. Joseph, ranging to about 410 m ASL. Physiography is controlled mainly by thick accumulations of glacio-fluvial deposits.

During the site visit, Met-Chem noticed a general relationship between the topographic high ground on the Eagle Island and the presence of the more erosion-resistant iron formation outcrops.

The natural drainage for Lake St. Joseph was east by the Albany River into James Bay, but dams at the east end of the lake and openings bulldozed at the west end of the lake, have resulted in the diversion of water into the English River watershed to feed reservoirs supplying hydro-electric generating stations. Water flows out at the southwest end of Lake St. Joseph into the Roots River and enters the northeast end of Lac Seul. Lac Seul, which is drained by the English River, provides water for hydro-electric stations at Ear Falls (townsite for the former Griffith iron mine), where the English River leaves the lake, and Manitou Falls, 30 km downstream, to generate 90,600 kW of electricity.

The Property is mainly covered by spruce boreal forest.

5.5 Fauna

Black bear, moose, lynx, cougar, white-tailed deer, red fox, short-tailed weasel, mink and river otter are present in the Property area. Bird species include bald eagle, blue heron, belted kingfisher, common nighthawk, grey jay, common loon, and various waterfowl.

6.0 HISTORY

6.1 Prior Ownership

Several companies owned the St. Joseph Lake Property until the claims were allowed to lapse (Table 6.1). Eventually, the Property claims were staked by P. Gagné and were acquired by Rockex in 2008.

6.2 Significant Historical Exploration Activities

The main activities directly related to the mineral exploration and development of the Property is summarized in Table 6.1.

Additional information is provided by WGM's 2011 technical report.

Table 6.1 – Summary of Mineral Exploration and Development on the Lake St. Joseph Property

Company	Date	Mineral Exploration & Development Work
Ontario Bureau of Mines	c. 1900	• Exploration • Jabez Williams staked claims over the Lake St. Joseph iron deposits • Drilling (Fish Island)
Ontario Department of Mines	1921	• Report on Iron Formation of Lake St. Joseph
Cons. Mining & Smelting Company of Canada Ltd.	1931-1932	• Trenching • Drilling, 5 holes
Antiquois Mining Corp. (St. Lawrence Columbium & Metals Corp.)	1956	• Geological and geophysical surveys (dip needle magnetometer) • Trenching
Lake St. Joseph Iron Ltd. ("**LSJI**"), (St. Lawrence Columbium & Metals Corp.); Holannah Mines Ltd.; M.A. Hanna Co.	1957	• Bulk sampling (Eagle Island) • Trenching • Dip needle survey • Metallurgical test work
	1957-1959	• Diamond drilling, 14,668 ft (4,471 m) in 35 holes • *"Reserve"* estimate
Algoma Steel Corp. Ltd. ("**Algoma**")	1966-67	• Option on the Gustafson property (SE of Eagle Island) • Ground magnetic survey • Drilling, 6 AXT-sized holes for 3,367 ft (1,315 m) • Property acquisition
	1968-1969	• Option of LSJI's property (Eagle, Fish and Wolf Islands) • Mapping; magnetic & gravity surveys • Trench re-sampling • Basic mineralogical studies and test work

Company	Date	Mineral Exploration & Development Work
	1973	• Leasing 73 claims from LSJI • Bulk sampling, 1,100 tons (Eagle Island) • Metallurgical tests (pilot)
	1974-75	• Diamond drilling,71 holes, 46,516.0 ft (14,178.25 m)
		• Davis Tube tests on composite samples, SolFe analyses of the head, concentrates and tails • Ground magnetic survey
	1975	• Pilot plant tests, flow sheet development • Geophysical surveys • Re-opening old trenches
Algoma, Stelco and Dofasco	1976	• Eagle Island iron property selected as best in NW Ontario for development
Algoma	1978	• Diamond drilling, 3 holes for 1,404.80 ft (428.20 m), 2 on Fish Island
	1979	• Acquisition of 70% of LSJI shares • Studies on the development potential of the property • Geological mapping (Fish Island; 1979-82)
Dofasco	1988	Acquisition of Algoma (and LSJI)
	2006	Claims became open
Pierre Gagné	2007	Staking of the Property
Pierre Gagné; Rockex	2008	• Additional claims staked or dropped • Drilling 5 confirmation twin holes for 1,312 m • Searching for historical hole collars • WGM : Technical Report on the LSJI Project for Rockex (May 2008) • Characterization of 4 core samples (SGS Mineral Services – Lakefield ("**SGS**"))
Rockex	2009-2010	• Acquisition of historic Algoma data files and core from Essar • Re-logging and check sampling (core)
	2010	• Additional claims staked • WGM: Updated Technical Report on the Western LSJI Project (Sept.)
	2011	• WGM: Technical Report & Mineral Resource Estimate On The Western LSJI Project (Jan.) • Airborne geophysical survey • Metallurgical testing
	2011-2012	Diamond drilling, 16 holes for 7,937.10 m

6.3 Historical Resources

6.3.1 Pre-NI 43-101 Resource Estimates

Prior to the latest estimate by WGM in 2011, resource for the Property had been estimated in 1956-1957, 1961 and 1975. WGM examined some of the old data, commented on these historical resource estimates in their 2011 report. Met-Chem will not quote or comment on the historical resource or reserve figures of 1957 or 1961, since they are non-compliant with the requirements of NI 43-101, are outdated and irrelevant for the purpose of this Report. Indeed, details on the analytical methods, or parameters and methodology used are lacking or may have changed so much as to not realistically reflect the present conditions.

The most recent historical mineral resource estimate that Met-Chem is aware of for the area west of Eagle Island was completed by Algoma in 1975. The results from this historical estimate are presented by WGM (2011) and were drawn from a report prepared by Algoma and dated November 26, 1975. These estimates were completed prior to the implementation of NI 43-101 and should not be relied upon. The main parameters and methodology applied to the estimate, such as the assay method, mass units (long or short tons), depth of the ultimate pit, etc., are unknown. These historical estimates are only discussed in the present Report because they might become relevant since the iron mineralization west of Eagle Island may, in the future, be considered as potential feed to the concentrator that would process the mineralization from Eagle Island, and possibly use some of the infrastructure and facilities built for Eagle Island.

Algoma estimated a tonnage and grade of iron mineralization for the Fish Island area contained in an open pit. Fish Island is located about 2.5 km west of Eagle Island. The estimate is based on the results from geophysical surveys, surface trenches and 14 LSJI holes drilled in 1957 to 1959 and aggregating about 7,000 ft (2,135 m). The tonnage and grade for iron mineralization extending to the west of Eagle Island, labelled as the West Extension Area and the North Limb, were also estimated (Table 6.1). The calculations are based on data from drill holes at approximately 500 m (1,600 ft) intervals, since this zone is entirely under water of Lake St. Joseph.

Table 6.2 – Historical Estimate of Iron Mineralization in the Fish Island and West Extension Areas (After Algoma, 1975).

Zone	Tonnage (M Long tons)	Grade (%Fe)
Fish Island	203	35.8
West Extension	55	23.4
Total	**258**	33.2

However, WGM (2011) quoted a memorandum by J.V. Huddart of Algoma, suggesting that, on the basis of 1981 mapping results, the Algoma estimates for Fish Island were overly optimistic and stated that the potential of the Wolf Island-Fish Island area is in the order of 100 M long tons rather than the 250 Mt. No documentation is available to Met-Chem in order to comment on this statement.

Although Met-Chem has not verified the historical resource estimate, on examination of the maps and drill results for the Fish Island area, the tonnage estimated by Algoma appears to be reasonable. In addition, two (2) holes drilled in 1978 and two (2) holes drilled in 2011 confirmed the presence of significant width and grade of iron mineralization at Fish Island. The iron formation has been traced westward from Eagle Island by geophysical survey, mapping and drilling over a distance of about seven (7) km.

The classification of the mineralization by Algoma is not compliant with the resources and reserves definition of Council of the Canadian Institute of Mining, Metallurgy and Petroleum ("**CIM**") (November 2010). No attempt has been made by a Met-Chem's QP to classify the historical estimates as current mineral resources or mineral reserves, and Rockex is not treating the historical estimate as current mineral resources or mineral reserves. Additional drilling is required to verify or upgrade the historical estimate for the area west of Eagle Island as current mineral resources or mineral reserves.

6.3.2 NI 43-101 Compliant Resource Estimates by WGM

WGM prepared a Mineral Resource estimate for the portion of the Lake St. Joseph Iron Project that had sufficient data to allow for definition of continuity of geology and grades. Consequently, WGM modeled the main Eagle Island mineralization, but did not include the Fish Island or Wolf Island areas.

WGM only used 63 Algoma holes totaling 20,829.95 m in their resource estimate. The estimate was completed using a block modeling method and the grades were interpolated using the Inverse Distance estimation technique.

Indicated Mineral Resources were defined as blocks being within 100 m of a drill hole intercept and Inferred Mineral Resources were interpolated out to a maximum of about 350 m on the edges of the deposit and at depth. A summary of the WGM's Mineral Resources is provided in Table 6.3.

Table 6.3 – Mineral Resources Estimate by WGM (2011)*, Eagle Island Deposit

Resource Classification	Tonnes (000s)	% SolFe Head-Individual Samples	% SolFe Head-Composite	% MagFe Head-Composite	% HmFe Head-Composite
Indicated	590,847	28.84	28.43	14.86	13.56
Inferred	415,757	29.47	29.07	14.52	14.55

* (Cut-off of 18% Head SolFe)

WGM assured that the classification of the Mineral Resources conformed to the definitions provided in NI 43-101. WGM further confirmed that they had followed the guidelines adopted by the CIM Standards in arriving at their classification. The details on the methodology and calculations performed by WGM are provided in their 2011 technical report.

Met-Chem has not verified the details of the methodology and calculations and has not validated the work completed by WGM. No attempt has been made by a Met-Chem's QP to classify the WGM's estimate as current mineral resource, and the resource figures are only quoted for comparison purposes with the present resource estimate by Met-Chem.

However, Met-Chem has every reason to believe that the resource estimate done by WGM reflects WGM's abundant experience in modeling the type of mineralization similar to the Lake St. Joseph iron deposit. Regardless, the present resource estimate by Met-Chem relies on drill hole data not available to WGM; consequently the resources estimate by WGM can no longer be considered as current and is superseded by the present estimate.

In order to estimate the resources that are the subject of this Report, Met-Chem used the 3D model constructed by WGM and modified by Rockex. Met-Chem augmented the database and the model with the results from the drill holes completed in 2008 and 2011-2012, updated the geological interpretation accordingly and made a few adjustments as seen fit. Details on the methodology and parameters applied to the resource estimate by Met-Chem are provided under Section Mineral Resource Estimate of the present Report.

6.4 Production

No production of iron mineralization has been reported from the Lake St. Joseph Property.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Property is situated in the Lake St. Joseph Archean greenstone belt of the Uchi Subprovince of the Canadian Shield. Younger and older felsic and mafic plutons underlie, surround and intrude the greenstone belt. The Lake St. Joseph greenstone belt is composed of four (4) volcanic cycles and each contains a sequence of basal tholeiitic basalt flows progressing upwards into dacitic to rhyolitic pyroclastic rocks. In the Lake St. Joseph area, the Cycle 2 volcanic rocks are unconformably overlain by a suite of clastic and chemical sedimentary rocks that form the Eagle Island assemblage, or Upper Clastic Rocks, which hosts the iron formation on the Property.

The base of the Eagle Island assemblage consists of eroded dacitic pyroclastic material derived from the upper part of the Cycle 2 volcanics. This sequence is succeeded upwards by arenite and wacke-sandstone beds, interbeds of mudstone, conglomerate and banded iron formation. The banded iron formation of Lake St. Joseph extends for an east-west strike length of approximately 10.5 km.

Shearing parallel to bedding is extensive adjacent to the regional Sydney Lake – Lake St. Joseph Fault passing along the south shore of the portion of Lake St. Joseph. Metamorphism is typically greenschist facies in the Lake St. Joseph area.

7.2 Property Geology

7.2.1 General

The Property is underlain by mafic to felsic volcanic rocks of Cycles 1, 2 and possibly 3, or by the Eagle Island sedimentary assemblage. The Eagle Island assemblage consists mainly of greywacke, shale, conglomerate and iron formation (Figure 4.3 and Table 7.1) deposited unconformably in a basin along the southern margin of the volcanic belt and subsequently re-folded with the volcanic sequence.

The sedimentary assemblage is largely in the form of an east-west trending, steeply plunging syncline containing a pair of sub-parallel anticlinal folds most clearly evident on Eagle Island. The south limb of the syncline, traceable because of its contained magnetic iron formation, extends from Eagle through Fish and Wolf islands and further west. The north limb of the syncline has been traced by magnetic surveys and a few drill hole intersections as extending west from Eagle Island and north of Fish Island.

The folded iron formation on the north part of Eagle Island is about 350 m to over 400 m wide and has been traced over a distance of approximately 1.3 km and to vertical depths of up to 500 m. The south east extension of this north part of the iron formation extends to form the east and south limits of the south shore of Eagle Island. The iron formation in this domain has a strike length in the order of 2 km, a true thickness varying from approximately 80 m to 200 m, with thicknesses diminishing with increasing distance along strike away from the north part of Eagle Island.

Multiple bands of iron formation exposed on Fish Island, 2.5 km west of Eagle Island, may be due to second-order folds along the south limb of the main structure or may represent a repeated sequence at the nose of another isoclinal fold. A series of trenches and drill holes have tested the sub-vertical zone over a strike length of 1.3 km to vertical depths of about 400 m.

Minor dykes were encountered but no major intrusive rock cutting into the iron formation sequence has been mapped.

Table 7.1 – Regional Stratigraphy Column (after Stott, 1996)

PHANEROZOIC
CENOZOIC
QUATERNARY
RECENT

Lake, stream and wetland deposits

PLEISTOCENE

Till, glaciofluvial sand and gravel, glaciolacustrine sand and clay

Unconformity

PRECAMBRIAN
PROTEROZOIC
PALEOPROTEROZOIC
Mafic Dikes

Diabase dikes

ARCHEAN
MESOARCHEAN to NEOARCHEAN
Felsic Intrusive Rocks
Unmetamorphosed late to post tectonic granitic rocks

Granodiorite, monzogranite, syenogranite, syenite, tonalite, trondhjemite, quartz diorite, granite pegmatite

intrusive contact

Metamorphosed pre- to syntectonic granitic rocks

Granodiorite, tonalite, trondhjemite, monzogranite, syenogranite, quartz diorite, granite pegmatite

intrusive contact

Metamorphosed felsic porphyry intrusive rocks

Quartz porphyry, feldspar porphyry, quartz-feldspar porphyry, felsite

intrusive contact

Mafic to Ultramafic Intrusive Rocks
Metamorphosed mafic intrusive rocks

Gabbro, diorite, anorthosite, melanocratic gabbro, leucocratic gabbro, plagioclase feldspar -phyric mafic intrusive rock, quartz-bearing mafic intrusive rock, peridotite, pegmatite

intrusive contact

Metavolcanics and Metasediments
Clastic metasediments

Lithic wacke, quartzose wacke, feldspathic wacke, mudstone

Chemical metasediments

Oxide facies (magnetite-bearing), sulphide facies (pyrite-bearing), silicate facies (amphibole -rich), and carbonate facies (siderite/ankerite) iron formation

Felsic metavolcanics

Massive flows, tuff, lapilli tuff, lapillistone, quartz-feldspar porphyry

Intermediate metavolcanics

Massive flows, pillowed flows, tuff, crystal tuff, lithic tuff, lapilli tuff, lapillistone, tuff breccia, pyroclastic breccia, quartz-feldspar porphyry

Mafic metavolcanics

Massive flows, pillowed flows, pillowed breccia, amygdaloidal flows, variolitic flows, autoclastic flow breccia, tuff, crystal tuff, lapilli tuff, lapillistone, tuff breccia, pyroclastic breccia, ultramafic tuff, amphibolite, epidote-rich layered flows or pyroclastic rock

7.2.2 Structure

The Lake St. Joseph iron formation is essentially in the form of an east to northeast trending, upright, steeply plunging syncline with superimposed coaxial anticlines. Isoclinal, second-order folds are common. The steeply dipping, tight and isoclinal folds have resulted in repeats in the iron formation sequence which is mainly coincident with the north, east and south shores of Eagle Island. Because of the folds, the bulk of the iron formation on the Property is concentrated on, and adjacent to, Eagle Island.

7.2.3 Mineralization

The iron formation consists of units of fine-grained iron oxide and silica interlayered with beds of greywacke, shale, mudstone, phyllite and conglomerate. Some layers also contain minor pyrite or pyrrhotite, but sulphide content of the oxide iron formation is generally sparse. Graphitic meta-sedimentary layers containing increased amounts of pyrite have been identified southeast of Eagle Island. The distribution of sulphide components may be partly controlled by stratigraphy (graphitic horizons) but also by gold-related alteration systems that affect various parts of the iron formation sequence, but apparently not to any significant extent the current Mineral Resource area.

Mineralization consists of fine-grained, near massive and intimate mixture of specular hematite and magnetite or well-banded magnetite containing very little hematite component alternating with quartz-chert beds. Gangue consists of silica, sericite, biotite, chlorite, carbonate with some hornblende and apatite. The ratio of hematite to magnetite in the iron formation on the Property has been variously reported as 3:1 to 1:1. Met-Chem agrees with WGM that variations in the hematite or magnetite abundance may occur in different parts of the Property.

From the calculated proportion of iron locked magnetite and in hematite, WGM found that the 2008 assay results indicated the pattern of dominantly hematitic mineralization with minimal magnetite. Met-Chem believes the variation in the distribution of the magnetite-ratio within the deposit is yet undetermined.

Metallurgical and mineralogical work conducted in the mid-1970s suggests that the grind requirement for liberation is 85% passing 500 mesh.

In 2008, SGS completed an *Investigation into the Mineralogical Characteristics of Four Samples of Iron Formation*, petrographic microscopy, X-ray Diffraction, QEMSCAN and electron micro-probe analysis. The work showed that the samples contained iron oxides and quartz as the main mineral species, followed by subordinate, but significant, amounts of micas and feldspar minerals.

The aluminum, potassium, sodium and phosphorus levels are a little higher than in typical Algoma oxide iron formation. This may be due to the higher content of sediments in the Lake St. Joseph iron formation compared to a typical Algoma iron formation. However, the deleterious element levels in the head analyses are not necessarily proportional to concentrations in iron concentrates.

During the site visit, Met-Chem observed a locally significant number of quartz veins crossing the iron formation, with evidence of multi-phase injection. Met-Chem also observed red jasper beds in several outcrops but was unable to determine whether they could serve as a marker horizon.

8.0 DEPOSIT TYPES

The Lake St. Joseph mineralization is considered to be iron formation of the Algoma-type, but it does have some characteristics that are not typical of Algoma iron formation.

Meyn and Palonen (1980) interpreted the Lake St. Joseph iron formation assemblage to be the product of a submarine fan environment. Unlike typical Algoma-type iron formation, the assemblage is turbiditic containing greywacke, shale, siltstone and conglomerate.

Typical Algoma-type iron formation consists of alternating beds of micro- to macro-banded iron oxides (magnetite and hematite) and quartz (chert), with variable proportions of oxide, carbonate, silicate and sulphide lithofacies. The deposits are interbedded with volcanic and sedimentary rocks formed near or distal from extrusive centres such as volcanic arcs or spreading ridges.

Such iron formations are the second most important source of iron after Lake Superior-type iron formations (Gross, 1996). However, no Algoma-type iron formation is currently mined in Ontario for iron. The Sherman, Adams and Griffiths mines that previously operated in Ontario mined similar iron deposits. The salient characteristics of the Algoma-type iron deposit model, as described by Eckstrand, (1984), can be found in WGM’s 2011 report.

The Lake St. Joseph iron formation has been affected by several episodes of tight to isoclinal folding, which is an important factor to take into account when planning any exploration program.

9.0 EXPLORATION

9.1 Historical Exploration

LSJI's initial exploration programs on the Property began in 1957 and continued through 1961. The programs consisted of extensive drilling and trenching covering Eagle, Fish and Wolf Islands. Dip Needle magnetic surveys were also conducted covering a large percentage of the Property.

From 1966 to 1981, Algoma carried out work on the Property that consisted of re-sampling of selected LSJI trenches and drilling two (2) Winkie holes, in order to validate the results reported by LSJI. Geological mapping and extensive Fluxgate ground magnetometer and gravity surveying were also carried out. Six (6) core holes were drilled as well.

Metallurgical work was completed in 1974-1975 at the at the Ontario Research Foundation ("**ORF**") facility west of Toronto. Initial work included microscopic examination that revealed iron minerals are mainly hematite and magnetite, in an overall ratio of 1:1, within a gangue of quartz, sericite, mica, carbonate, with some hornblende and apatite. It was concluded that grind requirements were 85% passing 500 mesh. The final report completed by the ORF on a pilot plant test work has not been recovered, but a detailed summary of the results is available in a memorandum from the Hanna Mining Co. dated October 20, 1976.

In addition to the work conducted by Algoma and Hanna, routine Davis Tube ("**DT**") testing of the drill core samples from Algoma's drill campaigns was also completed. Results are available for the 1974 and 1975 Algoma drill hole composites.

After the foregoing, little recorded exploration work was carried out on the Property until 2008.

9.2 Rockex Exploration

Rockex's first exploration program on the Property was initiated in March 2008. It consisted largely of a limited-scope drilling of twin core holes to validate historic Eagle Island drill results. Later in 2008, Rockex completed field mapping and searched for historic drill hole collars and trenches on Eagle Island.

In 2008, SGS carried out a study of the mineralogical characteristics and iron deportment on four (4) samples to develop the optimum process flow sheet for the deposit. Subsequent to this work, SGS carried out a review of four (4) previous reports on the metallurgical work on the Eagle Island deposit.

In April 2007, Essar Steel Holdings Ltd. ("**Essar**") purchased Algoma Steel. In late 2009, Essar transferred to Rockex the archived drill core from Algoma's 1974-1975 and 1978 campaigns in the original core boxes. The drill logs and assays results, reports and maps not available in the public domain were also delivered to Rockex. In early 2010, Rockex undertook a program of re-sampling and assaying of three (3) of the Eagle Island drill holes acquired from Essar, in order to validate the historic logging and assay results.

The main results from Rockex' exploration work was the validation of the analytical results from all the core drilled in 1974-1978 that could be incorporated onto the master database and be used in the resource estimate. This information, combined with two (2) drilling programs and preliminary metallurgical testing was sufficient to define NI 43-101 compliant resource estimate in a large part of the Property.

10.0 DRILLING

10.1 Historic Drilling

Drilling campaigns are reported to have been conducted to test the iron formation prior to 1920, in 1931-1932, 1957-1959 and 1966-1967. Although significant records are available for the programs conducted by LSJI in the 1950s and by Algoma in the 1960s, the results are not discussed here, although they were described in WGM's report because of their historic interest.

Actually, the present resource estimate by Met-Chem is based on validated drill hole data only and includes the results from the drilling programs of 1974-1978 onward, except for the twin holes drilled in 2008, for reasons explained under Mineral Resource Estimates of the present Report.

10.2 Algoma Drilling

Algoma completed an extensive drilling program in 1974-1975, mostly on, and adjacent to, Eagle Island. Five (5) holes tested the north limb of the main structure northeast of Fish Island and two (2) drill holes were completed northwest of Wolf Island. Another two (2) holes were drilled on Fish Island in 1978. The aggregate footage for the 1970s programs sums to 14,606 m in 74 drill holes The core, assay results and logs from the holes drilled by Algoma in 1974-1978 became available to Rockex and could be validated by re-logging and re-sampling to be incorporated into the database with the more recent data generated by the holes drilled by Rockex.

Sampling by Algoma was in nominal 10-foot core lengths similar to the sampling done by LSJI. No descriptions are available for the drill core sampling procedure, but from examination of Algoma's archived drill core, WGM found that drill core had been split and one half was retained in the core trays, the other one was sent for assaying. No sample tags are contained in the trays and markings on the core or trays are generally lacking.

Details on the drilling activities are presented in the WGM's 2011 technical report.

10.3 Rockex 2008 Drill Program

Rockex's initial drill program started in March 2008 with a program of five (5) twin holes aggregating 1,312 m. Table 10.1 lists the pairs of original and twinned holes, and distances between them.

Originally, drill hole EI-103 was spotted to twin the historic hole J-23-59 from Lake St. Joseph Iron Mines Ltd. The distance between the two (2) appears to be 15 m. The purpose of the program was to validate historic results. Four (4) of the drill holes selected for twinning had been drilled by Algoma in 1974. Rockex drill hole EI-104 was abandoned early at 203.3 m depth due to lost water circulation.

Table 10.1 – Original and Twin Holes Drilled by Rockex in 2008

Twin Hole (2008)	Original Drill Hole (1974)	Distance (m)
EI-101	EI74-005	35
EI-102	EI74-004	52
EI-103	EI74-023	55
EI-104	EI74-009	29
EI-105	EI74-010	16

All drill hole locations were spotted and re-checked on the casings after drilling using a precision GPS Trimble GEOXH to obtain UTM co-ordinates (NAD 83, Zone 17) with half-metre precision. Azimuths were set by sighting foresights using a GPS and the collar dips with an inclinometer. Acid dip tests were taken down the hole at 100-ft spacing, except in EI-104. Relatively severe flattening of the plunge of the hole, in the order of 20° between the collar and the bottom of the hole, was indicated.

Discovery Diamond Drilling Ltd., Morinville, Alberta, was contracted by Rockex to complete the 2008 program. NQ size core (47.6 mm) was retrieved.

Jean-Paul Barrette, Geo., was the Senior Geologist in charge of the program, as well as the designated Qualified Person in compliance with NI 43-101. A report entitled "*Drill Report, Western Lake ST. Joseph Iron Ore Project 2009, Trist Lake Area, Kenora Mines & Minerals Division, Ontario, NTS 52J/14NE, for Rockex Limited, 580 New Vickers St., Thunder bay, Ontario. P7E 6P1, By Jean-Paul Barrette Geo, Senior Geologist, and by Mitch Dumoulin, P. Geo., Senior Geologist; March 12, 2009; Thunder Bay, Ontario*" describes the drilling program.

J. P. Barrette completed detailed core logging, using a formatted Excel spreadsheet. Sampling was done systematically on 10-foot core lengths, with a few exceptions for the dykes. These lengths were chosen to correspond to the geological units and mineralized zones in the five (5) historic drill holes that Rockex duplicated, to allow comparisons of the results. The procedure included a QA-QC program of Blank, Duplicate and Replicate samples. Felsic dykes or sediments were commonly used as blanks.

Missing in the logs description is the core recovery percentage, but was reported as averaging 99.9% for each drill hole (Drill Report, 2009). Photographic record of the core was taken as well as magnetic susceptibility measurements, usually on the split core. Bulk density determinations were performed on a few core samples, using the water immersion method, as well as on about 16% of the pulp samples, by pycnometer.

10.4 Rockex 2011-2012 Drill Program

A drill program consisting of 7,937.1 m in 16 holes was completed between September 24, 2011 and January 27, 2012. Of these, 14 were drilled for a total of 6,917.9 m on or around Eagle Island, and two (2) of them were drilled on Fish Island for 1,019.2 m.

The main purposes of the program were to further test the junction area between the north part of the iron formation with SE extension, on Eagle Island, as well as completing a few infill holes and drilling along the extension of the iron formation at depth and laterally.

Rockex contracted Full Force Diamond Drilling Ltd. of Peachland, British Columbia, to perform diamond drilling using two (2) Zinex A5 rigs equipped to retrieve NQ2 size core (50.6 mm). The casing was left in all the holes and was capped with a wooden plug and identified with an aluminum tag stapled to a picket.

Cygnus Consulting Inc. ("**Cygnus**"), Montreal, Quebec, supervised the drilling program, carried out core logging and sampling and bagged the samples for shipment to the laboratory. The work was done under the supervision of David H. Albert, P. Geo. Cygnus prepared a report entitled: *"Assessment Work Report, Diamond Drilling Campaign on the Western Lake St. Joseph Property (2011), NTS 52J/14, for Rockex Mining Corporation, Submitted to the Northern Development and mines of Ontario; Prepared by David H. Albert, P. Geo, Associate Geologist; June 22, 2012; Cygnus Consulting Inc."*

Although Cygnus logged the main lithological contacts, the samples were largely based on systematic lengths of 3 m, without regard for the lithological contacts. Cygnus inserted blank samples into the sample sequence as the only form of monitoring the laboratory performance. No photographic record of the core, percent core recovery, magnetic susceptibility measurements or RQD calculations have been found by Met-Chem in the drill logs or in Cygnus report.

The hole path deviation was surveyed using a Deviflex instrument that is not affected by magnetic rocks, since it does not rely on a magnetic compass to measure the deviation along the azimuth.

11.0 SAMPLING PREPARATION, ANALYSIS AND SECURITY

11.1 Pre-Algoma Drilling Programs

LSJI plotted the analytical results on cross-sections as % Fe, without providing details on the assay methods, whether Soluble Iron or Total Iron, or on the laboratory. However, this data were not incorporated into the present resource estimate, as Met-Chem considers it is of historical interest only. Additional information on the subject is provided in WGM's 2011 report.

11.2 Algoma Drill Program (1974-1975)

Correspondence and a sample preparation flow sheet examined by WGM indicate that the drill core samples had been prepared and analysed at SGS. Details of the iron assays for individual samples and DT composites are not known with certainty, but likely included acid digestion followed by titration of soluble Fe.

The Rockex database contains 3,534 SolFe assays for the 1974-75 drill holes and 129 for the two (2) holes drilled in 1978 on Eagle Island. In addition, 503 DT tests results from Algoma's 1974-1975 and 29 from the 1978 drill holes were performed at SGS on samples that were mostly ranging from three (3) to nine (9) m in length.

11.3 2008 Drilling Program

The samples from Rockex's 2008 drilling program were sent to SGS for preparation and assaying.

The 2008 drill program generated 393 routine samples sent to SGS, for preparation, analytical and physical testing. The in-field QC samples consisted of 22 blank inserted into the sample stream, 39 duplicate samples, as well as an additional 22 second halves of core serving as a different type of duplicate samples. No standard reference material was used.

Sample preparation at the laboratory consisted of jaw crushing to nominal ¼ inch, riffling out a 1-kg sample to be roll crushed to -10 mesh and pulverized to -200 mesh. All the samples were analyzed for the major oxides and elements by Meta-Borate fusion XRF, including LOI and Total oxides %. FeO was determined by H_2SO_4/HF acid digest-potassium dichromate titration. Fe_3O_4 was measured by Satmagan and sulphur was analyzed by LECO furnace.

A few intervals of sulphide enrichment and alteration were assayed for gold.

Samples selected to prepare 126 composites of 10 m lengths, except for a few shorter intervals at the end of the iron formation units, were analysed for % TotFe and % MagFe by Satmagan.

The database also contains the results from specific gravity determinations completed by gas comparison (helium) pycnometer on 65 pulp samples. The values range from 2.75 to 3.74 and average 3.34.

11.4 2010 Historic Core Re-Sampling

The samples from Rockex's 2010 program of re-sampling the core from three (3) 1974-1978 Algoma holes (EI74-004, EI74-007 and EI75-050) were sent to SGS for preparation and assaying. The same analytical protocol as the one applied to the samples from the 2008 drilling program was used.

11.5 Rockex' 2011-2012 Drilling Program

The core from the 2011-2012 program was split using a diamond blade saw. One half was shipped via transport truck to SGS for analysis. The samples were submitted to Meta-Borate Fusion followed by XRF analysis of the major oxides, including % Total Oxides and LOI, as well as determination of sulphur by Leco furnace and test of the magnetic component by Satmagan. FeO was determined by titration after acid digestion.

Specific gravity ("**SG**") determinations were completed by gas comparison (helium) pycnometer on 174 samples and returned values averaging 3.17 and ranging from 2.68 to 4.44 (with one (1) value at 5.46).

The chain of custody and security, from the extraction of the core from the core barrel, through logging and sampling up to the time of dispatch to the laboratory were preserved by being under the control of Rockex. The core was transported from the drill rig to the core storage facilities in Thunder Bay and shipped to the laboratory by commercial carrier in wooden crates.

Following assay, the remaining material was returned to Rockex and stored under secure conditions at their facilities in Thunder Bay.

12.0 DATA VERIFICATION

12.1 Historical Validation Work

In 1973, Algoma re-sampled and assayed two (2) of LSJI's holes drilled and sampled in 1957 and 1958, for the purposes of validating LSJI's results. Details on the results are provided in WGM's 2011 report. Met-Chem will not discuss the results since the holes pre-dating 1974 are not used in the present resource estimate.

However, it is interesting to note that the assay results obtained by Algoma generally validated the work reported by LSJI.

12.2 Twin Drilling Program by Rockex (2008)

WGM (2011) commented that all five (5) of Rockex's drill holes generally intersected iron formation similar to what is described in drill core logs for the historic drill holes but in detail correlation were problematic. However, WGM agreed that, for the most part, Rockex's 2008 drilling results validate historic results. In addition, WGM recommended that Rockex re-visit the acid test results for its 2008 drill holes, since WGM suspected that the holes have steeper inclinations than reported in the Project database.

Met-Chem believes the distances between the original drill holes and the twin, ranging from 16 m to 55 m, is too large to validate previous drill results (Table 10.1), especially when testing steeply dipping iron formation affected by complex folds. Consequently, only broad correlations between the lithological and sample contacts can be expected from these twin holes, and consequently, between the analytical results from the pairs of drill holes. Met-Chem did not use the analytical results from the original (1974) drill holes in order to avoid clustering, but used the more recent twin holes drilled in 2008. This is discussed under the Section Mineral Resource Estimates of this Report (Sections 14.1 and 14.4.1).

12.3 Re-Sampling of Algoma's 1974-1978 Core by Rockex (2010)

In early 2010, Rockex undertook a program of re-logging, re-sampling and assaying of three (3) Eagle Island drill holes acquired from Essar to validate the historic logging and assay results as reported in the drill logs. The remaining split core that had previously been sampled by Algoma was logged, photographed by Rockex and three (3) drill holes were sampled along intervals designed to be equivalent to those used by Algoma.

In total, 316 routine samples were collected, to which 11 blank samples were added. No standards or duplicate samples were inserted into the sample sequence. The samples were forwarded to SGS for sample preparation and assay, using a protocol that was largely the same as the one used for Rockex's 2008 drilling program.

Five hundred and thirty-two (532) DT tests were also completed at SGS on nominal 10-m samples from Algoma's 1974-1975 and 1978 drill holes. The DT tails were also analysed for soluble iron. WGM examined some of the core and found it to be in good condition and, for the most part, was able to confirm that rock types and sample intervals largely matched those outlined in Algoma's historic logs.

The results from the 2010 re-sampling and assaying program on Algoma drill core allowed cross-comparisons between Rockex TotFe assays and Soluble Fe versus Algoma Soluble Fe assays.

12.3.1 Comparison of Rockex TotFe assays vs. Algoma SolFe Assays on Individual 10-ft Samples

WGM found that the results obtained by Rockex on TotFe assays by XRF vs. the historic Algoma Soluble Fe assays for equivalent samples indicate that for most samples, the Soluble Fe assays correlate strongly and are unbiased with respect to the 2010 Total Fe assays. WGM found that correlation between 26 samples that were initially believed to be equivalent is poor.

However, WGM and Rockex believe that, except for one, the 26 consecutive samples were probably not properly identified during the 2010 sampling program. The absence of footage blocks and/or markings in the core boxes makes some identification errors likely.

12.3.2 Comparison of Rockex vs. Algoma Soluble Fe Assays

In early 2010 a set of pulp samples from the 2008 twin hole drilling program that had previously been analysed by XRF were re-submitted to SGS for SolFe analysis. The purpose of this work was to try to replicate SGS's original SolFe assay results for the Algoma's samples.

Although WGM found that, in general, the new Aqua Regia results correlated reasonably well with Rockex's XRF assays, they appeared to under-report Fe for hematite-rich mineralization, for reasons that are not understood. This pattern does not appear to be indicated by the historic SolFe results. However the samples were analysed by Aqua Regia in two (2) different laboratories, and on samples from Rockex twinned holes that only approximately corresponded to the samples from the Algoma drill holes. Consequently, Met-Chem believes that only broad conclusions can be made between the two (2) sets of analytical results.

12.3.3 Comparison of Rockex XRF TotFe and Soluble Assays vs. Algoma Soluble Fe Assays

The test was repeated by re-assaying soluble SolFe by Aqua Regia digestion on the same 20 samples from Algoma drill holes and previously assayed by XRF by Rockex. The results illustrate that XRF Fe assays by Rockex correlate tightly with historic SolFe assays and are unbiased. WGM found that, for the samples that report less than 22% TotFe, Rockex's results for Fe by Aqua Regia versus Fe by XRF correlate well. However, some of the samples that report above 24% TotFe by XRF return less Fe by Aqua Regia.

Further study of the results by WGM appeared to indicate that Aqua Regia digestion is reporting less Fe than XRF in the samples that have more of their Fe in the form of hematite, for undetermined reasons. For samples where most Fe is in magnetite, an unbiased strong positive correlation between XRF and Aqua Regia Fe is maintained.

12.3.4 Comparison of Magnetic % Fe by Satmagan (Rockex) and Davis Tube Tests (Algoma)

In order to compare the Algoma's Magnetic Fe results calculated from the DT tests on composite samples from three (3) Algoma holes (EI-74-004, EI-74-007 and EI-75-050) with Rockex' Satmagan Magnetic Fe results, Rockex calculated averages for its Satmagan results on individual samples grouped into intervals equivalent to Algoma's historic sample composites. Thirty-one (31) composites (comprised of 243 10-ft samples) were available for comparison.

Several composites with missing or mixed up core could not be used. However, WGM and Rockex agreed that certain intervals of drill core were in fact mixed up, in which case the results indicated that Rockex's Satmagan results correlate to a high degree and are unbiased with respect to Algoma's magnetic Fe determined from DT tests.

12.3.5 Conclusions

Rockex's 2008 program was largely aimed at validating LSJI and Algoma's drill program results through twinning several of the historic drill holes. The percentage of core recovery was very high and Rockex's sampling was adequate to provide reliable and representative samples for assay.

WGM concluded that Rockex's sampling procedures for its 2008 drilling program and the 2010 core re-sampling were generally sound and generated reliable data.

Met-Chem generally agrees with WGM that the results from the 2008 drilling program and the re-sampling program of 2010 generated reliable data. On the basis of WGM's verifications and Met-Chem's own checks, Met-Chem believes the most important outcome of the re-sampling program is the confirmation that the TotFe results by XRF analysis by Rockex provided the same results as the original soluble iron assays by Algoma. This allowed to incorporate the 1974-1975 Algoma drill results into the database used for the resources estimation.

12.4 Verification by WGM

During a site visit completed in April of 2008, WGM reviewed historical exploration data, examined 2008 core and independently collected six (6) samples of the second half drill core to serve as check samples. Core was being carefully split in half using a hydraulic splitter. In the field, drill hole sites were validated for location using a handheld GPS. In WGM's opinion, core handling and sampling procedures were to industry standards and technically sound.

The assays for WGM's second half core samples are strongly correlated with original results for the other half of the core sampled by Rockex. Generally, WGM stated that Rockex's results are validated by their observations and independent sampling results. Additional information and graphs are presented in the WGM's 2011 report.

Satmagan results showed that WGM's results are biased very slightly higher than those received by Rockex. However, Met-Chem believes no statistically valid conclusion can be drawn from a population of six (6) samples.

12.5 Verification by Met-Chem

While preparing this Technical Report, Met-Chem reviewed the previous data and made the spot checks necessary to reasonably rely on the results validated by WGM and their conclusions. WGM was the qualified person for the previously filed technical report Met-Chem has largely drawn from.

12.5.1 Database Validation – Spot Checks on 2008 and 2011-12 Data

Met-Chem carried out spot checks of the database for errors such as gaps of overlaps in the lithology or sample intervals, duplicate entries, wrong collar locations, etc.

The original laboratory certificates for the twin holes of 2008, and about 20% of the certificates for the 2011-2012 drill samples were checked against the database entries, as part of the database validation. Minor errors were found and corrected, although some results for sulphur and MagFe% or FeO% have not been imported. However, the data required for the construction of the 3D model by Met-Chem was complete. Met-Chem agrees that the database supplied by Rockex is sufficiently complete and reliable for the purposes of the resource estimation.

12.5.2 Database Validation – 2008 Rockex Drill Program – QA/QC

Twenty-one (21) blank samples averaging 6.92% Fe and ranging from 3.24% to 9.11% Fe were inserted into the sample stream. Sedimentary rocks were generally used as blanks and Met-Chem believes they were inadequate to monitor possible sample-to-sample contamination, but at least indicated no mis-sequencing with iron-rich samples.

Thirty-nine (39) duplicate samples were part of the QA/QC program, with an additional 22 second half core used as duplicate samples. Met-Chem compared the results from the assay pairs for the two (2) halves of the core and found a very high degree of correlation (0.98) between the Fe% and FeO% analytical results (Table 12.1).

Table 12.1 – Comparison of Analytical Results for Duplicate Sample (Second Half-Core)

In-Field ½ Core Duplicate Samples	Original Analysis % TotFe	Analysis on the Duplicate Samples % TotFe	Original Analysis (*) % FeO	Analysis on the Duplicate Samples (*) % FeO
Number	22	22	21	21
Average	42.45	42.35	8.29	8.37
Maximum	54.8	54.6	15.62	15.89
Minimum	8.7	8.9	5.71	5.79

(*) One outlier removed

12.5.3 Rockex 2008 Drill Program – XRF vs. Soluble Iron

Met-Chem also checked the statement to the effect that Algoma's soluble iron assays correlated closely with Rockex' more recent Total iron by XRF. This is an important point because, if correct, the results from Algoma's holes are validated and can be incorporated into the master database and serve in the resource estimation. Met-Chem's calculations on 266 of the 316 analytical results used in the database confirm the closeness of the results yielded by the two (2) analytical methods. The main parameters calculated from the two (2) populations are presented in Table 12.2.

Table 12.2 – Main Statistical Parameters for the Algoma's Soluble Iron Assays and Rockex' Total Iron Assays

Parameter	(Aqua Regia Analysis) % SolFe	(XRF Analysis) % TotFe
Number of Samples	266	266
Average	27.3	27.5
Maximum	37.4	37.5
Minimum	4.0	5.2
Standard Deviation	5.6	5.6
Median	28.5	28.6
Mode	30.7	30.6
Correlation Coefficient (R)	0.97	

Consequently, Met-Chem agrees with WGM that the method of soluble iron analyses used on the original samples of the Algoma 1974-75 holes yielded the same results that the duplicate samples of the Rockex 2010 re-sampling program analysed for total iron by the XRF method.

This test allowed to validate the 1974-75 drill data and, consequently, Met-Chem used them in the mineral resource calculations.

12.5.4 Comparison of Satmagan (Rockex) Results vs. Davis Tube Tests (Algoma) on 2008 Samples

Met-Chem compared the results from the pairs of Satmagan tests completed for Rockex on samples from drill holes EI-74-004, EI-74-007 and EI-75-050 and those from DT tests performed by Algoma.

The samples consisted of 85 composites 10 meters long, except for those at the contacts of the iron formation units. Met-Chem found that the pairs of values are generally correlated, as indicated by a definite trend visible on a scattergram but with some scatter of the values. This partially agrees with the conclusion from WGM's examination of 31 composite sample results.

12.5.5 Cygnus' Work – 2011-2012 Drill Program

Although Cygnus logged the main lithological contacts, the samples were largely based on systematic lengths of 3 m, without regard for the lithological contacts. Met-Chem believes this is poor procedure resulting in possibly mixing populations of different characteristics and eliminating portions of iron formation at the contact with barren material by dilution.

Met-Chem found several inconsistencies and errors in the Cygnus drill logs and assay sheets, such as:

- Unit logged as greywacke in the lithology description and as mudstone in the assay sheet (EI-107, 377.6-384.2 m); 1.8 to 50.0 m in EI-107 logged as mudstone, reported as mudstone from 1.8 to 19.0 m and LIF (lean iron formation) to 50.0 m in the assay sheet;
- Lack of shoulder sample at the contact with an iron formation unit described above; no shoulder sample above iron formation contact at 337.7 m in EI-106;
- Samples 195283 to 195285 (EI-107, between 377.6 to 384.2 m) not entered into the database;
- Several units with high Fe values logged as sediments;
- Portion of a unit logged as mudstone (850.0 to 862.0 m in EI-106) returning values in excess of 21% Fe;
- Long core lengths of sediments between two (2) iron formation units cut as 3-m samples (i. e. 87 m in hole EI-116; 298.0 to 385.0 m), providing little useful information on material that can reasonably be considered as internal waste.

Cygnus inserted blank samples into the sample sequence as the only form of monitoring the laboratory performance. 85 blanks returned % Fe values ranging from 1.48 to 6.40% (one value at 10.84%), with an average of 3.02% Fe. Clearly, the material was not barren and could not have adequately monitored sample-to-sample contamination. Met-Chem believes a QA/QC protocol including the use of blank and Certified Reference Materials ("**CRM**" or standards) and duplicate samples should have been used, as normal industry practice. CRMs are particularly important, since they represent the only way of checking the accuracy of the results. The use of a third party laboratory, to which 5% of the pulp samples are generally sent for re-assay, is also part of a thorough QA/QC program. The lack of QA/QC program has an impact on the reliability of the results, which is reflected in the mineral resource classification.

From the available data examined, Met-Chem believes that the core should have been handled more diligently by Cygnus and best practices guidelines should have been followed. Details on the iron mineralization have been lost and subsequent audits of the Projects have been made more complicated.

Although the integrity of the data gathered during the 2011-2012 program has not been fully preserved, a relatively large database containing over 4,000 assays in 73 drill holes was available to Met-Chem to construct the resources model. Met-Chem believes this data are sufficiently reliable and complete to be used in a resource estimate.

In addition, Met-Chem believes that the extensive work targeted at the Eagle Island deposit and the fair repeatability of the iron analyses in the different phases of drilling combine to provide a fair representation of the geological and grade continuity within the large-scale Lake St. Joseph deposit, with simple overall geometry. However, the uncertainty attached to the drill data is one of the factors taken into consideration by Met-Chem in the mineral resource classification.

12.5.6 Site Visit

The QP visit was completed, as part of the NI 43-101 requirements, by Met-Chem's Senior Geologist, Yves A. Buro, Eng., between June 16 and 18, 2013. One day was spent visiting parts of Eagle Island with Mr. Pierre Gagné, Chairman of Rockex, and another day was devoted to the examination of documents and drill core with Mr. Paul Malench, Project Coordinator, at the Rockex office in Thunder Bay. Several rounds of discussions on geology and mineral resources had been held with Gilles Fillion, M.Sc. A, B. Sc. P. Eng. P. Geo., a Rockex Director.

A series of drill sites on Eagle Island from the 2008 and 2011-2012 programs were visited. The collar locations were recorded using a hand-held GPS and the inclination and azimuth of the hole casings was checked using a clinometer. Comparison of the readings in the field and the database entries for ten (10) hole collars showed that all were well within the accuracy of the GPS instrument. All the holes examined were protected with a casing secured with a wooden plug and identified with a picket bearing an aluminum ID tag.

Examination of a few outcrops revealed the presence of an important East West shear, isoclinal fold with sub-vertical axes and some of different geometry or of sedimentary origin. A locally significant amount of quartz veins were observed as well as red jasper beds in the iron formation. All the iron formation outcrops visited were on high ground.

12.5.7 Core Review

The core from hole EI-107 was examined and the lithological and sample contacts were checked against the drill logs. The pieces of sawn core had been carefully placed in the core boxes, with the paper sample tags stapled on the bottom of the boxes at the beginning of the samples. The contacts between the samples were marked, but not always, on the core facing down, rather on the sawn surface.

No errors in the measurements were observed and a good agreement was observed between the visual estimation of the iron grade and the analytical result for iron reported on the logs.

12.5.8 Check Sampling

A batch of 18 samples were selected from three (3) drill holes (EI-108, EI-109 and EI-115) mainly to represent iron values close to the cut-off grade of 18% Fe and to the mode (30-34% Fe) of the values for all the samples in the database used for the resource estimate. The rejects were used, as Met-Chem believes they are preferable to the small split quarter core samples to serve as QP's check samples. Unfortunately, no standards were available to be inserted into the batch of check samples.

The sample rejects were retrieved by Rockex while Met-Chem was still on site. All the rejects selected by Met-Chem were available and easily found, thanks to an efficient system of storage in marked 55-gallon drums on pallets. The samples were sent to SGS for preparation, XRF analysis of major oxides, sulphur determination by LECO furnace, FeO titration and Satmagan test, using the same protocol applied to the original samples.

The analytical results and the basic statistical parameters for the original and the samples selected by the QP are presented in Table 12.3. The plot of the % TotFe results on a scatter diagram show a very high degree of correlation and no bias (Figure 12.1). The soluble iron results display a slightly lower correlation and a distinct high bias toward the check samples (Figure 12.2). This can be expected considering that several factors influence the method, particularly at the digestion stage. The QP replicate samples selected for Met-Chem closely reproduced the original analytical results.

Table 12.3 – Analytical Results and Basic Statistics from Met-Chem's QP Check Samples

Hole-ID	From (m)	To (m)	Sample Number	XRF		Satmagan		Soluble Fe	
				% TotFe	% TotFe Check	% MagFe	% MagFe Check	% Fe^{++} as FeO	% Fe^{++} as FeO Check
EI-108	61.0	64.0	194381	33.99	33.92	18.4	17.6	8.77	8.86
EI-108	64.0	67.0	194382	31.06	32.45	14.6	14.8	7.25	8.08
EI-108	67.0	70.0	194383	31.68	31.55	17.7	16.8	8.59	9.07
EI-108	70.0	73.0	194384	27.21	27.28	16.2	16.2	7.93	8.46
EI-108	73.0	76.0	194385	24.83	25.53	18	18.3	8.45	9.34
EI-108	76.0	79.0	194386	21.82	22.17	18.2	18.2	8.55	9.48
EI-108	79.0	82.0	194387	18.12	18.61	16.2	16.5	7.75	8.68
EI-109	137.0	140.0	194320	18.12	18.54	-	16.0	7.74	8.47
EI-109	140.0	143.0	194321	18.47	19.37	-	17.7	6.37	8.89
EI-109	143.0	146.0	194322	19.51	18.19	-	13.6	8.49	6.98
EI-109	146.0	149.0	194323	32.38	32.59	-	13.5	7.18	7.61
EI-109	149.0	152.0	194324	37.98	37.35	-	10.3	5.38	5.85
EI-109	152.0	155.0	194325	32.24	31.55	-	9.2	5.76	6.26
EI-115	26.0	29.0	194983	17.21	18.68	16.0	16.5	8.67	9.48
EI-115	29.0	32.0	194984	30.92	31.41	30.0	28.7	14.49	14.78
EI-115	32.0	35.0	194985	32.73	33.29	32.9	30.8	15.25	15.61
EI-115	35.0	38.0	194986	33.71	33.92	33.6	31.4	15.60	15.89
EI-115	38.0	41.0	194987	17.28	18.12	15.9	15.3	9.32	10.1
			Correlation Coefficient	0.995		0.850		0.970	
			Average	26.63	26.92	13.8	17.9	8.97	9.55
			Maximum	37.98	37.35	33.6	31.4	15.60	15.89
			Minimum	17.21	18.12	0.0	9.2	5.38	5.85

Figure 12.1 – Analytical Results from QP Samples (Total Fe %)

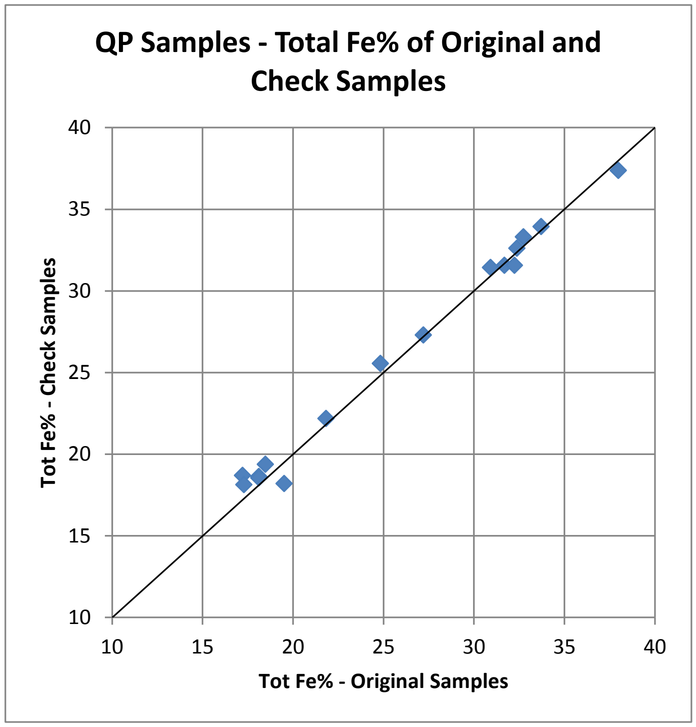
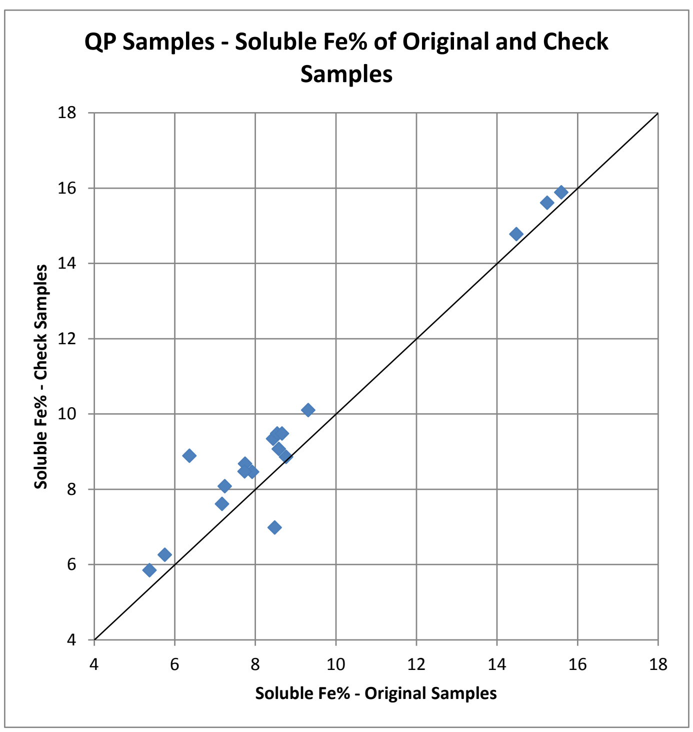


Figure 12.2 – Analytical Results from QP Samples (Soluble Fe%)



Specific gravity was also measured by pycnometer at SGS on the QP samples (Table 12.4).

Table 12.4 – Specific Gravity Determination on the QP Samples

Hole Id	From	To	Sample No	Specific Gravity	Specific Gravity, Check Samples
EI-108	61.0	64.0	194381	-	3.61
EI-108	64.0	67.0	194382	-	3.57
EI-108	67.0	70.0	194383	3.31	3.54
EI-108	70.0	73.0	194384	-	3.43
EI-108	73.0	76.0	194385	-	3.41
EI-108	76.0	79.0	194386	-	3.27
EI-108	79.0	82.0	194387	-	3.2
EI-109	137.0	140.0	194320	-	3.19
EI-109	140.0	143.0	194321	-	3.23
EI-109	143.0	146.0	194322	-	3.17
EI-109	146.0	149.0	194323	-	3.57
EI-109	149.0	152.0	194324	-	3.74
EI-109	152.0	155.0	194325	-	3.58
EI-115	26.0	29.0	194983	-	3.16
EI-115	29.0	32.0	194984	3.38	3.47
EI-115	32.0	35.0	194985	-	3.56
EI-115	35.0	38.0	194986	-	3.54
EI-115	38.0	41.0	194987	-	3.11
			Average		3.41
			Maximum		3.74
			Minimum		3.11

a) Acid Dip Tests

Met-Chem agrees with a comment made by WGM to the effect that the plunge of the 2008 drill holes, as plotted on the sections, was suspiciously shallow. This observation is of some importance, since the attitude of the holes has a direct impact on the interpreted true width of a mineralized zone.

During the site visit, Met-Chem retrieved the acid dip test tubes for one (1) hole (EI-103) and checked the etch marks. The readings of the angles by the Rockex geologists were found to correspond to ours and the corrections for the capillarity had been properly applied. These tests did show a rather severe flattening of the plunge of the drill holes. Consequently, no changes on the plunge of the holes entered in the database are advised by Met-Chem.

b) Magnetic Susceptibility Measurements by Rockex

The magnetic susceptibility measurements are available for the core drilled by Rockex in 2008. The readings show an erratic signal composed of a series of short-range peaks and lows, from which Met-Chem found it impossible to discern plateaux at different levels that would distinguish discrete iron formation intervals of differing content of hematite or magnetite. The only obvious flat portions of the profiles indicate the presence of non-magnetic dykes and sediments.

Since the measurements from the susceptibility meter do not seem to be able to distinguish units within the iron formation with different proportions of magnetite vs. hematite, Met-Chem believes this somewhat casts doubt on the validity of the proportions described by the geologists based on visual inspection of the core.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The purpose of the test work program was to characterize the Rockex iron deposits and to produce a flow sheet that would allow for the production of iron concentrate of the following quality: Fe grade above 65%, SiO_2 near 5% and a Fe Recovery near 80% from Eagle Island mineralization, while maximising the weight recovery.

To develop the flow sheets, several tests were performed at SGS facilities. Some test programs were successful in terms of demonstrating the efficiency and applicability of certain equipment: SAG mills, ball mills, gravity concentration using spirals and magnetic separators and desliming.

The tests at SGS confirmed that conventional gravity and magnetic separation would efficiently and effectively concentrate the iron bearing minerals.

The mineralization itself does require complex treatment for successful beneficiation. Some of the silica and fine iron silicates are eliminated by spiral concentration. However, fine grinding and magnetic separation is required to ensure that the weight recovery of the final concentrate is maximised.

A technical flow sheet was established using the tested, successful techniques that will allow Rockex to reduce the Run of Mine ("**ROM**") to a pulp of acceptable size to achieve liberation of the gangue minerals and produce a concentrate having the purity requirements of the iron industry.

13.1 Mineralogical Characteristics and Iron Department Study

Rockex had provided SGS with a diverse arrangement of drill core samples for preliminary testing. A total of four (4) composites were tested.

The four (4) samples, identified as SJWGM-01, SJWGM-02, SJWGM-05 and SJWGM-06 were subjected to a detailed mineralogical examination by X-ray powder diffraction, optical microscopy, micro-probe and QEMSCANTM.

For the samples submitted, the major findings were:

- Fe-Oxides minerals within samples ranged from 25 to 55% w/w;
- The main gangue minerals were quartz (varying from 20 to 30% w/w), muscovite clays (10 to 25% w/w), plagioclase (3 to 10% w/w), and K-feldspar (1 to 8% w/w);
- Iron is primarily and strongly associated with iron oxide ranging from 95 to 97.4% w/w;
- Fe-Oxides, in particular hematite, begin to become liberated at the less than 150 to 75 micron size range (summed free and liberated grains ranged 18.6 to 29.9% w/w);
- Fe-Oxides, when not liberated, are associated with silicates;
- Silicates at the less than 1,000 to 300 microns size range had a summed free and liberated grains percentage range of 23.8 to 80.4% w/w.

13.2 Previous Test Work Programs

Western Lake St. Joseph deposit has been tested by different testing centers since the early 1930s with mixed results.

Some of the most promising test work completed in 1975 by Algoma Steel Corporation. Algoma used several desliming stages. The Algoma test work targets the removal of the gangue mineral via preferential settling. The first stage desliming feed is ground to –50 µm to which 47% w/w reports to tailings via the desliming overflow. The material is then reground in a pebble mill to -45 µm where a further 13% and 5.3% w/w are removed in the second and third desliming stages respectively. Focus was directed toward liberating the silicates in order to make the final target Fe grade. The Algoma pilot plant produced a 66.5% Fe concentrate with 80.3% Fe recovery and 34% weight recovery.

13.3 Summary of the Test Work Programs

SGS received drill core samples from the Eagle Island deposit for metallurgical test work from Rockex. The objective of the test work was to develop a flow sheet, whereby the final Fe concentrate grade will be above 65% Fe with a SiO_2 content near 5%, while achieving 80% recovery.

SGS conducted a specific test work program involving; comminution testing, gravity separation, magnetic separation, desliming and flotation.

a) Comminution Tests

Preliminary test work included Bond Ball Work Index ("**BWi**") test and SAG Power Index ("**SPI**" ® Test) to establish the grinding power requirements.

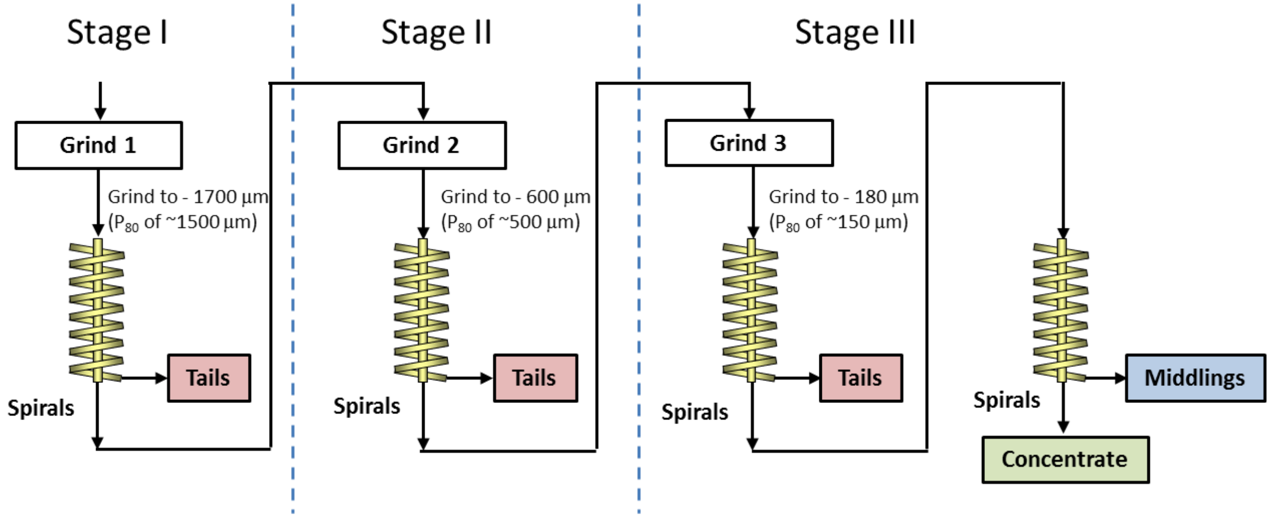
The SPI is an indication of the amount of energy required in primary grinding systems. SPI 37.3 minutes, which is equivalent to a specific grinding energy in the SAG mill of 8.12 kWh/t.

The BWi, an indication of the amount of energy required in a ball mill grinding system, was measured to average 10.6 kWh/t.

b) Gravity Separation Tests

The mineralogical characterization indicates that the silicates become liberated at a size much coarser than the iron oxides. In order to determine if silicates could be rejected at a coarser size grind, Wilfley table testing was performed at three (3) grind sizes, P_{100} of 1,700, 600 and 180 µm respectfully (see Figure 13.1 for test work simplified flow sheet).

Figure 13.1 – Gravity Separation Amenability Testing Flow Sheet



The results of the gravity amenability test work is summarized in Table 13.1, reveals that between Stage I and II, 15% weight can be rejected with an 8.1% loss in iron. Stage III showed promising results concerning its ability to make a concentrate (16.7% weight at 57.2% Fe grade). Further test work at –180 µm was pursued for both tailings rejection and concentrate production.

Table 13.1 – Gravity Separation Amenability Testing Results

Grind Size P_{100}	Stream	Stage Weight Distribution % w/w	Overall Weight % w/w	Fe Grade % w/w	SiO_2 Grade % w/w	Stage Fe Distribution % w/w	Overall Fe Distribution % w/w
1,700 µm	Stage I - Feed	100.0	100.0	29.3	44.5	100.0	100.0
	Stage I - Tails	9.2	9.2	17.0	52.9	5.3	5.3
	Stage I – Concentrate	90.8	90.8	30.6	43.6	94.7	94.7
600 µm	Stage II - Feed	100.0	90.8	30.6	44.9	100.0	94.7
	Stage II - Tails	6.4	5.8	14.1	56.4	3.0	2.8
	Stage II - Concentrate	93.6	85.0	30.8	44.1	97.0	91.9
180 µm	Stage III - Feed	100.0	85.0	30.8	44.1	100.0	91.9
	Stage III - Concentrate	16.7	14.2	57.2	15.1	31.0	28.5
	Stage III - Middlings	51.9	44.1	31.9	44.0	53.7	49.4
	Stage III - Tails	31.4	26.7	15.0	59.8	15.3	14.0

A grade recovery curve was produced by performing multiple passes on a Wilfley Table. The target grind was a P_{100} of 180 µm, with the resulting P_{80} being 88 µm. The results of the test are summarized in Table 13.2.

Table 13.2 – Grade/Recovery Results From a Multiple Pass Wilfley Table Test at -180 µm

Cumulative Weight Distribution % w/w	Cumulative Grade % w/w		Cumulative Distribution % w/w	
	Fe	SiO_2	Fe	SiO_2
1.9	69.1	1.9	4.7	0.1
3.7	69.0	2.1	9.0	0.2
9.3	68.8	2.6	22.3	0.5
14.5	67.5	3.9	34.1	1.3
20.4	60.9	11.3	43.3	5.1
59.6	36.2	38.8	75.1	51.2
62.4	35.9	39.0	77.8	54.0
66.3	35.5	39.5	81.7	58.1
73.4	34.3	40.7	87.4	66.3
100.0	28.8	45.1	100.0	100.0

c) Magnetic Separation Tests

Magnetic separation testing was performed at a fine grind size, i.e. a P_{100} of 38 µm. The magnetic intensity was low and was targeting the ferromagnetic iron oxide mineral (magnetite) in the feed. The hematite predominately reports to the non-magnetic fraction of the test work. Figure 13.2 shows the test scheme used: feed was ground to -38 µm and subjected to a rougher Low Intensity Magnetic Separation ("**LIMS**") circuit consisting of one (1) stage of counter current and two (2) stages of concurrent. The rougher concentrate is then reground to -25 µm and submitted to one (1) stage of concurrent magnetic separation. The finishing concentrate is then deslimed producing a final tail.

Figure 13.2 – Magnetic Separation Test Work Flow Sheet

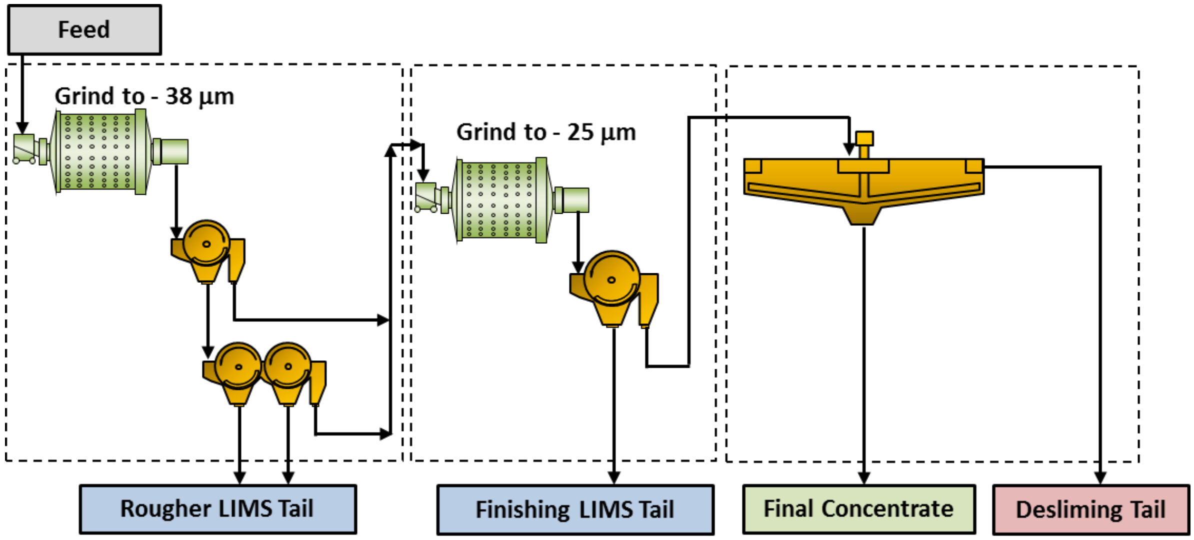


Table 13.3 shows the results of the magnetic separation tests. 51.6% of the Fe is recovered in the rougher stage with a corresponding grade of 57.3% Fe. The regrinding of the concentrate further liberates the magnetite from both hematite and silicates making a finishing concentrate with a grade of 63.9% Fe with a Fe recovery of 50%. The final desliming step was necessary to make a concentrate with a grade above 65% Fe. The desliming tails contained 0.8% of the overall Fe content with a corresponding weight of 1.34%; the final concentrate had a 66.9% Fe grade.

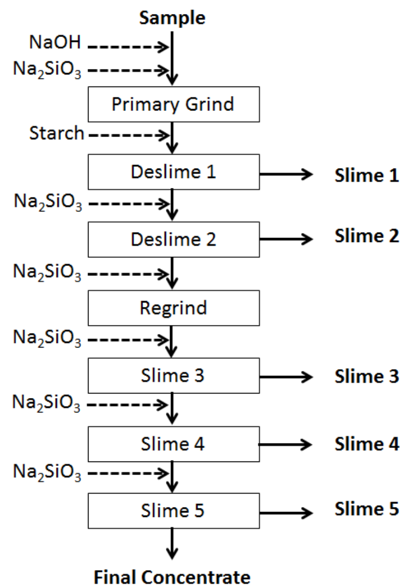
Table 13.3 – Magnetic Separation Test Results

		Grade % w/w		Distribution % w/w	
Stream	**Wt %**	**Fe**	**SiO_2**	**Fe**	**SiO_2**
Feed	100	28.3	45.7	100	100
Rougher LIMS Tail	74.5	18.4	55.8	48.4	90.9
Rougher LIMS Concentrate	25.5	57.3	16.3	51.6	9.1
Finishing LIMS Tail	3.36	14.1	66.1	1.7	4.9
Finishing LIMS Concentrate	22.1	63.9	8.7	50	4.2
Desliming Tail	1.34	17	63.07	0.8	1.8
Final Concentrate	20.8	66.9	5.19	49.3	2.4

d) Desliming Tests

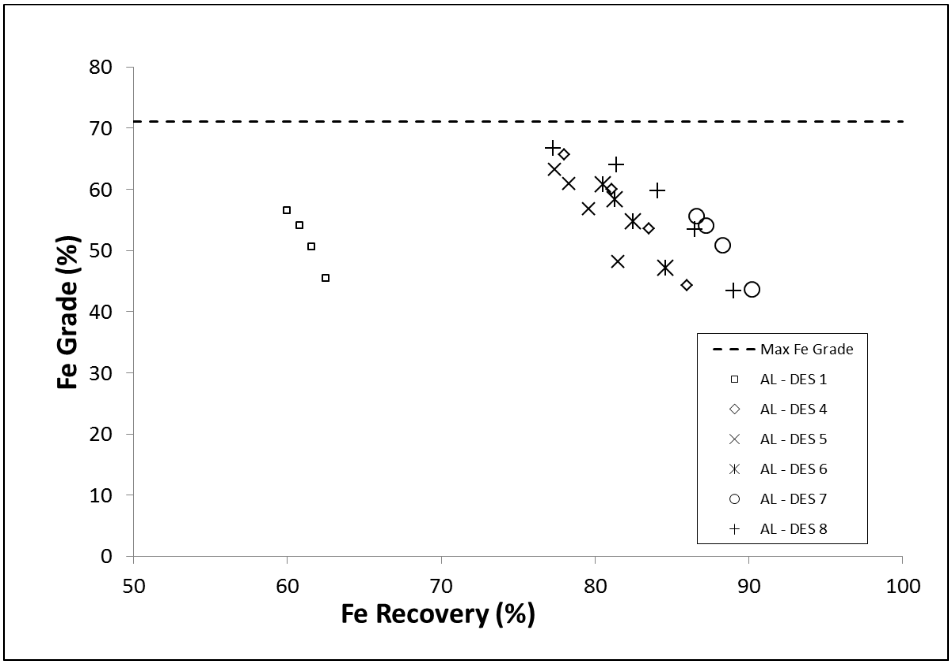
The test work done by Algoma in the 1970s used an all-desliming flow sheet. Figure 13.3 illustrates the all-desliming used by Algoma. Recreation of the test work in terms of procedure and conditions was carried out in order to reproduce the results, i. e. ~80% Fe recovery with a Fe grade above 65%.

Figure 13.3 – All-Desliming Test Flow Sheet as Used by Algoma in Their 1970s' Test Work Program



Eight (8) tests were conducted, out of which three (3) reached the SiO_2 target of near or below 5%. The final grind size to liberate the silica and ranged from a P_{80} of 20 µm to about 25 µm (100% passing 38 µm). Figure 13.4 summarizes the results in a Fe grade versus Fe recovery graph. The highest Fe grade was achieved in AL-DES-08 with 66.9% Fe and a corresponding recovery of 71.6% Fe.

Figure 13.4 – Desliming Fe Grade Versus Fe Recovery Results

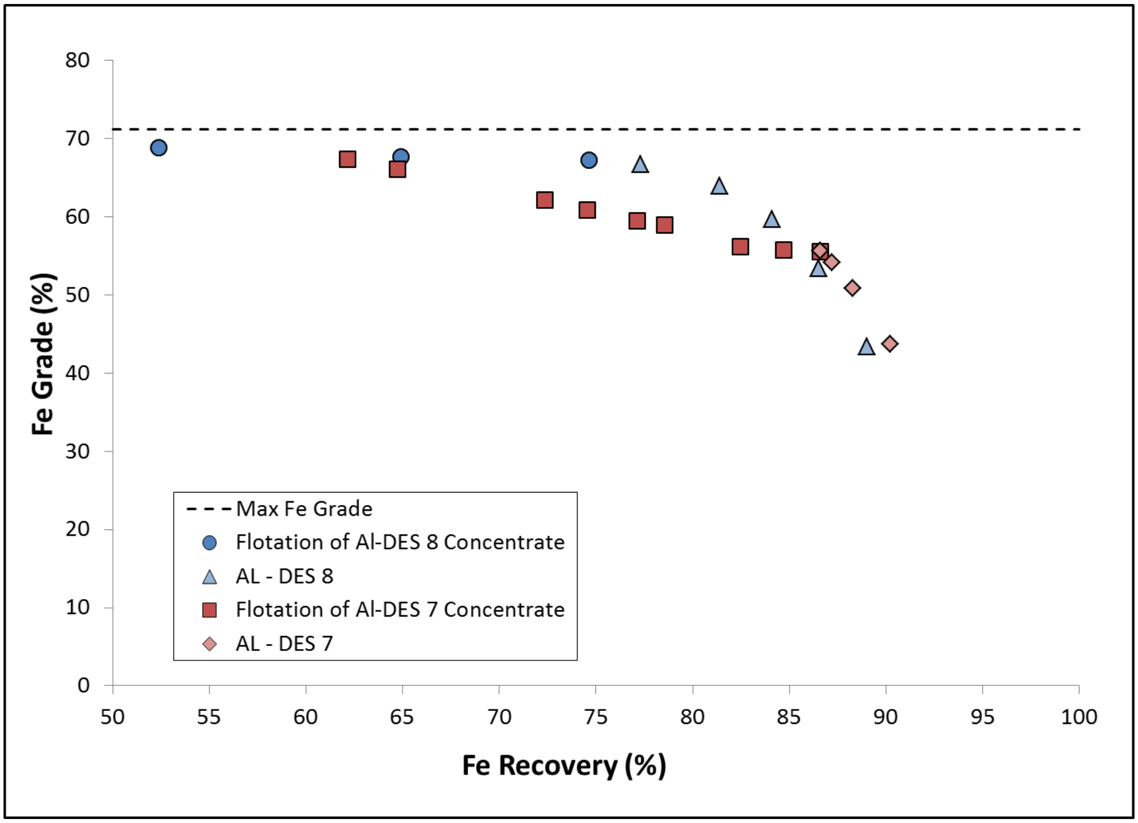


e) Flotation Tests

In order to evaluate the possibility of further increasing the grade of the concentrate, reverse silica flotation was performed upon concentrates produced during desliming test work. Flotation produced concentrates with a Fe grade above 67% and a SiO_2 grade below 3% while the corresponding Fe recoveries ranged between 50 to 70%. Figure 13.5 illustrates the Fe grade/Fe recovery curves for the flotation test work.

The fine size of the material poses a challenge to selectivity of the flotation as a process. More depression of the iron is needed in order to improve the Fe recovery. Throughout the flotation test work, a high degree of agglomeration was observed. This agglomeration may be due to magnetic attraction and demagnetizing the pulp prior to flotation should be investigated. It may also be possible to improve Fe recovery with the addition of scavenger stages on the silicate flotation product. Further optimisation of the flotation test work is warranted as it may improve overall results.

Figure 13.5 – Flotation Grade Recovery Curves with the Corresponding All-Desliming Results



13.4 Conclusions and Recommendations

13.4.1 Conclusions

a) The tested mineralization was amenable to gravity separation techniques. A concentrate with a weight recovery of 14.5% and 67.5% Fe can be produced while a tail corresponding to 26.6% weight can be rejected with a loss of 12.6% Fe.

b) The magnetite within the tested material was concentrated via low intensity magnetic separation. A weight recovery of 20.8% was achieved with a corresponding Fe grade of 66.9%.

c) Desliming results achieved were comparable to those obtained by Algoma, with recoveries ranging between 80 to 70% and Fe grades ranging between 65 to 67%.

d) The required concentrate grade parameters of Fe above 65% and SiO_2 near 5% from the Western Lake St. Joseph Project mineralization can be achieved.

e) Potentially, the weight recovery can be increased by using wet high intensity magnetic separation and or with hydraulic separation.

f) The final concentrate produced by the concentrator is fine enough to be used directly by a pellet plant without further grinding and can be classified a "pellet feed".

13.4.2 Recommendations

a) To improve the iron recovery while maintaining the iron content above 65% and SiO_2 below 5%, the test work studies as in Section 13.5 below have to be optimised and reproduced in a variability study.

b) Desliming test work needs to investigate to benefit of more recent reagents. Although the reagents used were effective, recent advances in desliming reagents may provide chemicals that provide superior results.

c) The flow sheet has to be confirmed with both lock-cycle and pilot plant testing.

13.5 Future Test Work

In order to attain the next level of study, the following test works are recommended.

a) Lock-Cycle Test Work

The various stages of the process need to be tested in combination to determine how the processes combine together. A lock-cycle is required to determine overall process recovery and concentrate grade.

b) Pilot Plant Test Work

The pilot plant data will give significant amounts of additional data. Since this mineralization type is complex in nature, this step is of major importance to validate the adopted flow sheet.

c) Comminution Test Work

To improve the accuracy of the SAG mill sizing in the pre-feasibility phase, crushing and grinding test work is recommended to evaluate the variability of the mineralization. Existing drill core samples should be used for this purpose. A JK Drop Weight Test should be performed on a representative composite of the mineralization as it will be mined while SMC Tests should be performed on the lithologies present to gauge the variability of the deposit.

d) Concentrate Slurry Transport Test Work

As this section will be a major expense, for the pre-feasibility study, slurry transport testing should be performed. Due to the fine nature of the pellet feed, rheology testing is needed especially with a focus on the effect due to changes in pulp density.

e) Concentrate and Pellet Feed Settling Test Work

For the pre-feasibility study, settling testing for thickeners should be done. This can be done using a testing laboratory or a vendor facility.

f) Pellet Feed Filtration Test Work

For the pre-feasibility study, testing for filtration equipment should be done.

g) Balling Design Parameter Test Work

Balling test work is suggested, but not required for pre-feasibility. The balling design parameters should comprise:

i) Green pellet chemical analysis (including but not limited to the content of water, magnetite, hematite, elemental iron, dolomite, limestone, hydrated lime, blast furnace slag or scale and recycle fired pellets);

ii) Green pellet physical analysis (including green pellet size distribution, crushing strength, tumbler strength, porosity, specific gravity and bulk density).

h) Pot Grate Design Parameter Test Work

Pot Grate testing is suggested, but not required for pre-feasibility. To provide prospective customers with a proven quality product, balling and pot grate test work should be done.

The pot grate design parameters test work should be based on fired pellets and include:

i) Pre-heating (drying) time, temperature, air flow and heat requirements;

ii) Induration (cooking) time, temperature, air flow and heat requirements;

iii) Cooling time, temperature, air flow and heat requirements;

iv) Optimal hearth layer thickness for the above;

v) Fired pellet physical analysis (including fired pellet size distribution, crushing strength, tumbler strength, porosity, specific gravity and bulk density);

vi) Fired pellet chemical analysis (including assay results of fired pellet and analytical results of the minerals and mineralogical structure);

vii) Fired pellet metallurgical test work results (including reducibility, swelling reduction and softening).

i) Wet High Intensity Magnetic Separation (“**WHIMS**”)

Testing of the tails from the LIMS circuit with a high intensity type of separation equipment should be further investigated. Due to the fine nature of the material at its liberation size, a SLON is the suggested device.

j) Hydraulic Separation Test Work

Testing of the material with a hydraulic classifier at coarser size range and a reflux classifier at the finer size range may provide similar/better results than the desliming circuit.

14.0 MINERAL RESOURCE ESTIMATES

14.1 Mineral Resource Estimates Statement

Following the last drilling campaign held on the Eagle Island mineralization from the fall of 2011 to the winter of 2012, Met-Chem was mandated by Rockex to carry out a resource estimate update of the Eagle Island mineralization with the intent to use the information for the preparation of a NI 43-101 compliant Preliminary Economic Assessment ("**PEA**"). Of the 16 holes drilled during this drilling campaign, 14 were located on the Eagle Island mineralization while the remaining two (2) holes were located on the Fish Island mineralization. The present estimate update only refers to the Eagle Island mineralization. Additional drilling is necessary on Fish and Wolf Islands in order to perform resource estimates to increase the total resource tonnage of the Property. In addition to the 14 new holes added on the Eagle Island mineralization, this resource estimate update also takes into account five (5) twin holes drilled in 2008, to verify available historical information, when Rockex became owner of the Lake St. Joseph Iron Property. These holes were not used by WGM in the previous resource estimate issued on January 28, 2011. The entire database contained 216 records resulting from exploration work between 1956 and 2011. Ninety (90) of them were used to interpolate blocks constrained within the iron solids generated for the Main Zone ("**MZ**") and the South East Zone ("**SEZ**") of the Eagle Island deposit.

The geological interpretation and the generation of updated 3D solids were performed by the geological team of Rockex. Met-Chem performed minor changes on these solids before their use for the resource modelling. The resource estimate was performed by QP or under their supervision. The resource classification follows the guidelines adopted by the CIM through the NI 43-101 standards and guidelines. The criteria used by Met-Chem for classifying the estimated resources are based on certainty of continuity of geology and grades. The CIM standards for resource classification are provided in Section 14.2. A summary of the Mineral Resource is provided in Table 14.1.

Table 14.1 – Summary of the Mineral Resources (Cut-Off of 10% Fe)

Category	Tonnage (Mt)	Fe (%)
Indicated	1,287	28.39
Inferred	108	31.03

14.2 Definitions

According to the final version of the CIM Standards/NI 43-101 which became effective on February 1, 2001 and was revised on June 30, 2011:

A **Mineral Resource** is a concentration or occurrence of diamonds, natural, solid, inorganic or fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

14.3 Mineral Resource Estimate Estimation Procedures

The estimation of the Eagle Island Mineral Resource includes the following procedures:

- Validation of the drill hole database received from Rockex;
- Importation of the database in MineSight® v. 7.80-2;
- Basic statistics to assess the statistical parameters of different quality elements and make decisions on the compositing length and need for grade capping;
- Importation, adjustment and validation of the solids provided by Rockex;
- Geostatistical analysis of Fe% constrained within the mineralised solid of the Main Zone to assess the mineralization spatial continuity and determine the search ellipse parameters;
- Generation of a block model;
- Interpolation of the iron content for all blocks constrained within the mineralized solids;
- Development of a linear regression model for estimating the specific gravity for each block depending on its iron content;

- Validation of the resource estimate;
- Classification of the resource according to CIM/NI 43-101 standards;
- Mineral Resource Statement.

14.4 Drill Hole Database and Data Verification

14.4.1 Drill Hole Database

The drill hole database used was supplied to Met-Chem both in Excel and Access formats. The entire database consisted of 216 records, of which 136 records refer to exploration holes drilled by different companies between 1956 and 2011. The remaining 80 records refer to 44 geotechnical holes and 36 exploration trenches. Table 14.2 provides a summary of all exploration holes by drilling campaign and company name. The sampling length and the number of holes with lithological and assaying records are also mentioned. None of the LSJI holes, the exploration trenches or the Algoma Steel Corp ("Algoma") holes of 1967 was used for the current resource interpolation. However, the lithology intervals of all holes were used to model the geological solids.

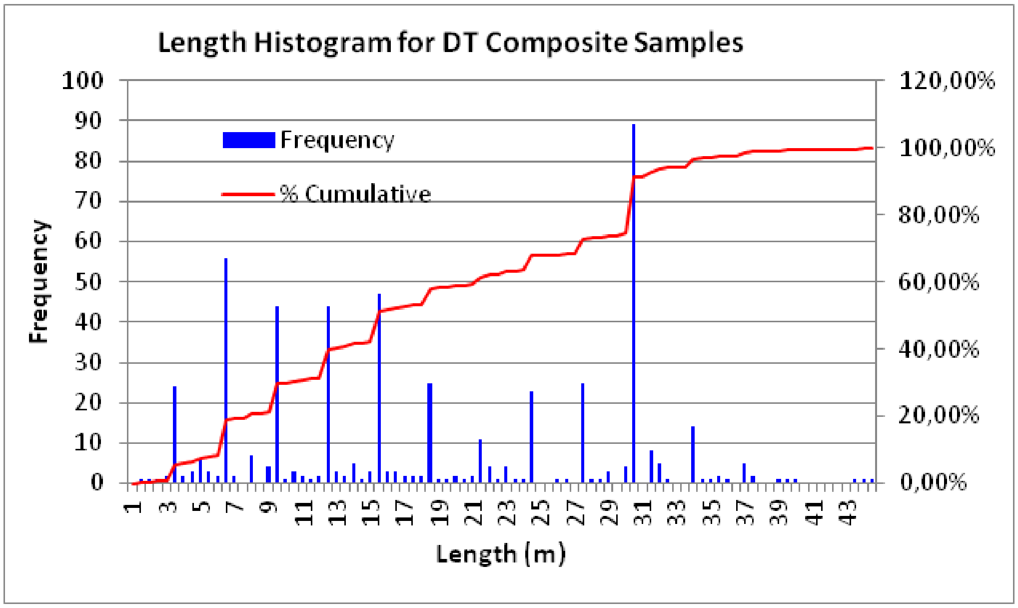
Table 14.2 –Compilation of Exploration Holes in the Database

Company	Drilling Campaigns	Holes	Goal	Length (m)	Holes with Litho Records	Holes with Assays Records	Sampling Length
Rockex Limited	2011	16	Exploration	7,937.10	16	16	6,704.50
Rockex Limited	2008	5	Twinning	1,311.88	5	5	1,217.59
Algoma Steel Corp.	1974-1978	74	Exploration	14,743.64	70	72	11,204.94
Algoma Steel Corp.	1967	6	Exploration	1,314.59	0	6	550.46
Lake St. Joseph Iron Ltd.	1956-1962	35	Exploration	4,562.42	34	25	2,364.10
Total		**136**		**29,869.63**	**125**	**124**	**22,041.59**

Furthermore, to smooth the clustered effect of samples belonging to the twin holes, drilled in 2008, and their parent holes, drilled in 1974; it was elected to just keep the samples of the twin holes for the resource interpolation. The clustering effect is known, in resource interpolation, as the overweight of areas densely drilled/sampled comparatively to areas with less drilling. This could lead to a bias in the estimate. The parent holes discarded are EI74-001, EI74-005, EI74-009 EI74-23 and EI74-010. Thus, 90 holes were used for block interpolation.

The drill holes contained geological codes and short descriptions for each unit and sub-unit. For historical holes, the standard method used for assaying the iron content is the wet chemistry method which gives the soluble iron. Only this variable was present in the database for those holes. As historical work, Algoma also performed DT tests on 532 composite samples. Results of these tests were provided as a separate sheet. The length of these composite samples was ranging from 1.22 m to 94.44 m with 30.48 m (100 ft.) being the statistical mode.

Figure 14.1 – Length Histogram for Davis Tube Composites Samples



In the previous resource estimate WGM elected to "composite" the DT composite samples into a regular length of 10 m, same as the compositing length that was used to composite the assays. This was to allow their use for the resource interpolation. In Met-Chem's opinion, the compositing approach itself is a method for aggregating several samples, through weighting, into a uniform and identical length. Since the statistical mode of composite samples is three (3) times the compositing length, the final results of such "compositing" would more consist in a splitting of the original samples into smaller lengths. As a consequence, this splitting would lead to the fact that the assaying results for each original sample are just repeated in split intervals although they did not reflect the natural variability of the variable under consideration. To avoid such a situation, Met-Chem found it to be more appropriate to discard the DT results in the current resource estimate.

Holes drilled since 2008 were assayed with the XRF method. Thus, the analytical iron delivered is the total iron. In 2008, Rockex performed analyses using both Wet and XRF methods on selected samples in order to characterize the quality of their relationship. The conclusions of that analysis are discussed in detail in Section 12.5.4. A good correlation between results of XRF and Wet Methods was found. Consequently, Rockex decided to merge both analytical results in the same column in the database. Met-Chem believes that, even if a combined column is of course necessary to allow resource interpolation, the database should additionally contain separate columns for each type of analytical results.

14.4.2 Data Verification

Met-Chem performed the following validation steps once the database was received:

- Checking for location and elevation discrepancies and unusual values;
- Checking minimum and maximum values for each quality element to ensure that all values are ranging within the tolerable limits;
- Checking for inconsistency in the lithological units and for overlaps in the lithology and assays intervals;
- Checking for gaps in the lithological code intervals;
- Checking for repeated intervals/samples.

This first validation step was performed before importing the data into MineSight®. A further validation process was completed when importing the data into Torque, a SQL based database manager linked with MineSight®. All missing fields were replaced with a -1 value. Another validation step was to compare the assay results entries in the database, for selected holes, with the assay results as displayed in original laboratory certificates. The selected holes belong to Rockex's drilling campaign of 2008 and 2011. No major transfer errors were found.

WGM recommended in the previous resource report that further field work be undertaken in order to improve the localisation and azimuth information for the Algoma drill hole collars. Met-Chem supports this recommendation and believes that it is one of the steps to be completed before being able to upgrade the mineral resource into a measured category where the drilling density is sufficient. Fields contained in the drill hole database are summarized in Table 14.3.

Table 14.3 – Fields contained in the Drill Hole Database

Collar_Fields	Assays_Fields	Litho_Fields
Hole-ID	Hole-ID	Hole-ID
Location_X	From	From
Location_Y	To	To
Location_Z	Length	Rock_Code
Length (m)	"Sol_Iron"	Rock_Long
Azimuth (°)	SiO_2_%	
Dip (°)	Al_2O_3_%	
	Tot_Fe_2O_3_%	
	MgO_%	
	CaO_%	
	Na_2O_%	
	K_2O_%	
	TiO_2_%	

Collar_Fields	Assays_Fields	Litho_Fields
	P_2O_5_%	
	Cr_2O_3_%	
	V_2O_5_%	
	LOI_%	
	S_%	
	Fe_% Mag	
	Fe_3O_4_% Mag	
	Fe_2_FeO_%	
	MnO_%	

Table 14.4 summarizes basic descriptive statistics calculated on the entire raw data, regardless of any geological interpretation. Tot_Fe_2O_3_% designates the total iron, of the XRF analysis, expressed as Fe_2O_3 while Fe_3O_4_%Mag represents the results of the Satmagan measurement and Fe_%Mag its stoichiometric conversion into iron.

As aforementioned, the column “Sol_Iron” in fact represents a mix-up of historical soluble iron, by Wet Chemistry Method, and total iron, by XRF analyse. Hence, the term “Sol_Iron” could be misleading. In the present case, Met-Chem elected to replace the name of the fields “Sol_Iron” or “Sol_Fe%” respectively by “Iron” or “Fe%”.

Since Fe% is the only quality element present for both historical holes (69 holes) and Rockex’s new holes (21 holes), only this element was interpolated.

Table 14.4 – Descriptive Statistics of Quality Elements in the Entire Database

	Arith. Av.	Median	Mode	St. Dev.	Variance	COV	Range	Min.	Max.	Samples
“Sol_Iron”	26.32	29.30	32.80	10.71	114.66	0.41	61.72	1.28	63.00	8344
Tot_Fe_2O_3_%	32.46	36.00	47.10	16.30	265.56	0.50	58.27	1.83	60.10	2906
Fe_2_FeO_%	7.42	7.01	6.44	2.65	7.00	0.36	24.98	1.67	26.65	2630
Fe_% Mag	11.78	12.70	0.40	6.83	46.67	0.58	35.30	0.01	35.30	2705
Fe_3O_4_% Mag	16.26	17.60	0.40	9.43	88.96	0.58	48.70	0.01	48.70	2704
SiO_2_%	49.21	47.20	43.00	8.78	77.17	0.18	42.00	33.00	75.00	2906
Al_2O_3_%	8.05	6.87	15.00	4.40	19.34	0.55	18.37	1.43	19.80	2906
MgO_%	1.80	1.48	1.34	1.11	1.24	0.62	16.03	0.47	16.50	2906
CaO_%	1.76	1.37	1.02	1.24	1.53	0.70	11.28	0.52	11.80	2906
Na_2O_%	1.56	1.35	0.86	0.91	0.83	0.58	4.95	0.05	5.00	2906
K_2O_%	1.96	1.85	1.71	0.83	0.70	0.43	7.04	0.01	7.04	2906
TiO_2_%	0.26	0.22	0.11	0.16	0.03	0.62	1.73	0.04	1.77	2906
P_2O_5_%	0.38	0.33	0.33	0.22	0.05	0.56	1.16	0.05	1.21	2906

	Arith. Av.	Median	Mode	St. Dev.	Variance	COV	Range	Min.	Max.	Samples
Cr_2O_3_%	0.011	0.010	0.005	0.011	0.000	1.002	0.249	0.001	0.250	2906
V_2O_5_%	0.010	0.010	0.005	0.021	0.000	2.092	1.079	0.001	1.080	2903
MnO_%	0.05	0.04	0.03	0.03	0.00	0.58	0.31	0.01	0.31	2906
LOI_%	2.321	1.535	0.030	2.977	8.861	1.283	99.690	0.010	99.700	2882
S_%	0.058	0.020	0.010	0.150	0.023	2.593	4.749	0.001	4.750	1599

14.4.3 Geological Modelling Procedures

The update of the geological solids, to account for the 14 holes drilled in 2011, was completed by M. Gilles Fillion, P. Geo., M. Sc., Director of Rockex. The solids were transmitted to Met-Chem which did some minor adjustments before their use to code the assays and blocks. The methodology used by M. Fillion to generate the 3D solids was based on the traditional sectional interpretation on 2D prior to generation of 3D envelopes by triangulation. One solid was generated for each of the MZ and SEZ.

The geological model is based on a single iron envelope for each zone. However, it was noted that iron shows a higher variability in the case of the SEZ. This variability has an impact on the efficiency of blocks estimate since it is not possible to constrain high grade domains separately from low grade domains. It is necessary to conduct further investigations/works in order to better characterize the high variability observed in that zone and ultimately define sub-solids to better control resource interpolation in upcoming estimates.

A topographic surface was provided by Rockex. Met-Chem also generated a Triangulated Irregular Network ("**TIN**") using collar elevations of drill holes and the bottom of the overburden to guide the creation of final solids representing the iron formation and ensure that the mineral resource estimate stayed below these surfaces.

14.5 Statistical Analysis and Compositing

The geological solids were used to constrain the assays of holes selected for resource interpolation. Basic descriptive statistics were calculated on the resulting raw data in order to get a better understanding of statistical parameters and take necessary actions before moving forward into the next steps of a resource estimate.

In Table 14.5 and Table 14.6, statistics were calculated only on the assays constrained in the MZ and SEZ.

Table 14.5 – Descriptive Statistics of Assays within the Iron Formation in the Main Zone

	Arith. Av.	Median	Mode	St. Dev.	Variance	COV	Range	Min.	Max.	Samples
Fe_%	27.45	29.20	30.00	7.34	53.88	0.27	39.10	2.00	41.10	3203
Al_2O_3_%	6.11	5.28	5.30	2.76	7.60	0.45	15.61	1.49	17.10	1399
CaO_%	1.44	1.19	1.02	0.92	0.85	0.64	7.94	0.58	8.52	1399
Cr_2O_3_%	0.01	0.01	0.01	0.01	0.00	0.71	0.23	0.01	0.24	1398
Fe_% Mag	14.82	14.30	13.20	4.70	22.11	0.32	35.20	0.10	35.30	1399
Fe2_FeO_%	7.64	7.29	7.11	1.90	3.62	0.25	14.33	2.58	16.91	1139
Tot_Fe_2O_3_%	39.57	42.10	44.00	10.38	107.82	0.26	53.66	4.94	58.60	1399
Fe_3O_4_% Mag	20.47	19.65	18.20	6.49	42.07	0.32	48.60	0.10	48.70	1398
K_2O_%	1.85	1.77	1.34	0.72	0.52	0.39	7.03	0.01	7.04	1399
LOI_%	1.46	0.88	0.10	3.13	9.81	2.14	99.69	0.01	99.70	1382
MgO_%	1.65	1.45	1.46	0.87	0.76	0.53	10.99	0.61	11.60	1399
MnO_%	0.04	0.04	0.03	0.02	0.00	0.51	0.15	0.01	0.16	1399
Na_2O_%	1.27	1.12	0.86	0.59	0.35	0.47	3.74	0.10	3.84	1399
P_2O_5_%	0.43	0.38	0.33	0.17	0.03	0.40	1.01	0.11	1.12	1399
S_%	0.03	0.02	0.01	0.08	0.01	2.55	1.26	0.01	1.27	730
SiO_2_%	45.81	44.80	46.50	5.41	29.28	0.12	35.20	33.00	68.20	1399
TiO_2_%	0.19	0.16	0.13	0.12	0.01	0.60	1.15	0.04	1.19	1399
V_2O_5_%	0.011	0.01	0.01	0.03	0.0008	2.52	1.07	0.01	1.08	1396

The elements average for both zones appear similar except that there seems to be slightly more magnetite in the MZ. Furthermore, when the Coefficient of Variation ("**COV**") is considered, it appears that the SEZ generally shows higher grades variability. Only Fe% is interpolated since other elements are only available for holes drilled in 2008 and 2011. Those elements could be interpolated in further resource estimates once additional drill holes have provided a more representative data set.

The sample length histogram was also generated in order to have a visualisation of the sampling length frequency and to choose the best length to be used to composite all assays into a uniform length (Figure 14.2).

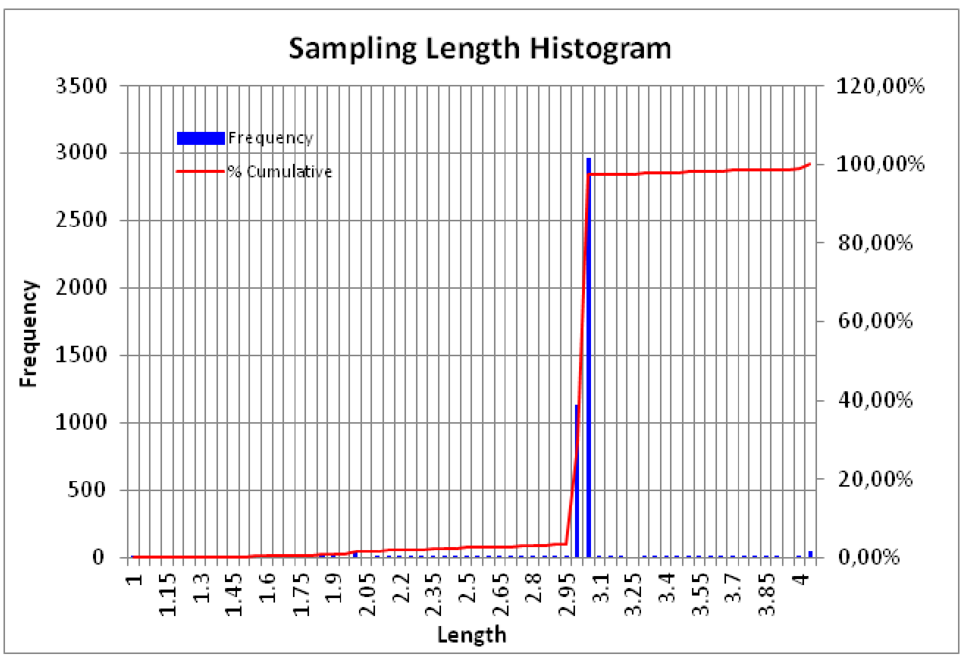
The histogram shows two (2) particular lengths of high frequencies, namely 3 m and 3.05 m. The first represents the most sampling length of the recent drilling campaigns while the second represents the most sampling length (10 ft.) for historical holes.

The general rule, for choosing the compositing length, is to consider the statistical mode of the assay sampling intervals, since it is the best one which will allow most of the assays to stay unmodified after compositing. In this case, the mode is 3.05 m (10 ft.) and represents the compositing length chosen by Met-Chem.

Table 14.6 – Descriptive Statistics of Assays within the Iron Formation in the South East Zone

	Arith. Av.	Median	Mode	St. Dev.	Variance	COV	Range	Min.	Max.	Samples
Fe_%	27.04	29.59	34.00	9.58	91.81	0.35	42.28	2.72	45.00	1142
Al_2O_3_%	7.41	6.83	10.10	4.14	17.15	0.56	16.57	1.43	18.00	418
CaO_%	1.99	1.39	1.21	1.68	2.81	0.84	8.96	0.61	9.57	418
Cr_2O_3_%	0.01	0.01	0.01	0.02	0.00	1.09	0.24	0.01	0.25	418
Fe_% Mag	13.24	13.70	15.60	6.64	44.05	0.50	29.40	0.10	29.50	261
Fe_2_FeO_%	7.36	7.03	7.02	2.12	4.50	0.29	12.27	1.67	13.94	418
Tot_Fe_2O_3_%	35.79	37.65	50.10	14.50	210.27	0.41	56.21	3.89	60.10	418
Fe_3O_4_% Mag	18.29	18.90	21.50	9.17	84.09	0.50	40.60	0.10	40.70	261
K_2O_%	1.85	1.62	0.65	1.08	1.17	0.58	5.92	0.03	5.95	418
LOI_%	2.13	1.27	1.12	2.43	5.90	1.14	15.99	0.01	16.00	418
MgO_%	2.03	1.41	1.14	1.64	2.69	0.81	15.82	0.68	16.50	418
MnO_%	0.04	0.04	0.03	0.03	0.00	0.58	0.15	0.01	0.16	418
Na_2O_%	1.42	1.25	0.60	0.91	0.83	0.64	4.92	0.05	4.97	418
P_2O_5_%	0.45	0.40	0.31	0.22	0.05	0.49	1.14	0.07	1.21	418
S_%	0.04	0.02	0.01	0.05	0.00	1.27	0.52	0.01	0.53	389
SiO_2_%	46.54	44.85	43.60	7.31	53.48	0.16	34.70	34.70	69.40	418
TiO_2_%	0.24	0.22	0.08	0.15	0.02	0.61	0.75	0.04	0.79	418
V_2O_5_%	0.01	0.01	0.01	0.00	0.00	0.40	0.02	0.01	0.03	418

Figure 14.2 – Sampling Length Histogram for Assays Within the 3D Solids



Regular down the hole compositing approach was used to composite assays restricted to the mineralization solids. All composites shorter than 1.5 m were discarded in order to avoid bias introduced by short intervals. Table 14.7 provides Fe% statistics for the composites data. The Fe% average for MZ and SEZ is preserved after compositing. The composites histograms of Fe%, for both MZ and SEZ, are displayed on Figure 14.3 and Figure 14.4. The iron distribution in the MZ is more uniform and close to a Gaussian distribution than the one in the SEZ which appears more scattered with a high variability. This more scattered pattern explains the higher coefficient of variation on the SEZ.

Table 14.7 – Composites Statistics

	Main Zone % Fe	South East Zone % Fe
Average	27.47	27.07
Median	29.11	29.49
Mode	28.87	33.59
Standards Deviation	7.01	9.19
Variance	49.07	84.38
COV	0.26	0.34
Range	39.17	39.42
Minimum	1.91	3.37
Maximum	41.08	42.79
Samples	3190	1125

Figure 14.3 – Composites Histogram of % Fe on the Main Zone

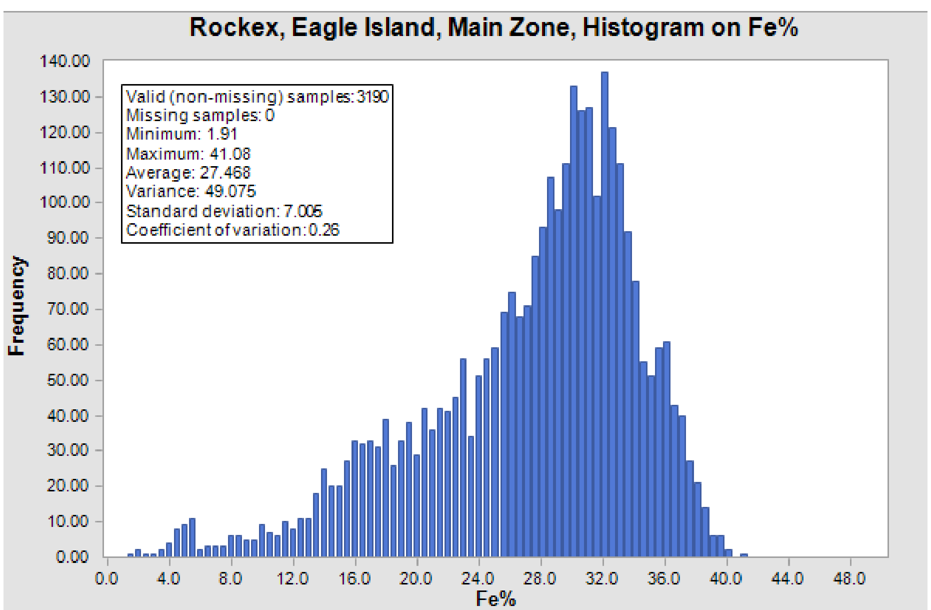
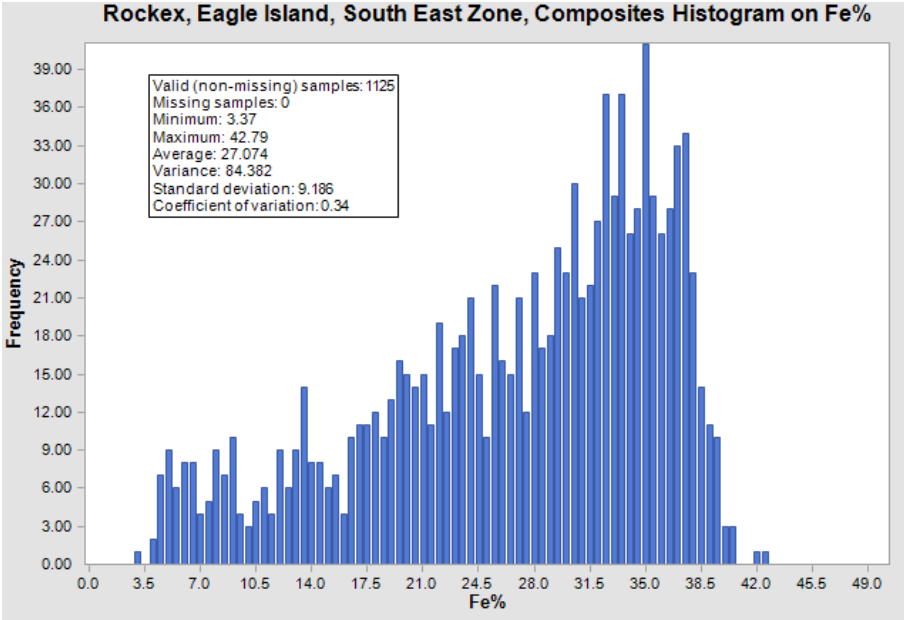


Figure 14.4 – Composites Histogram of % Fe on the South East Zone



Additional investigations/drilling would allow to better define the SEZ and ultimately define sub-solids for constraining high grades and low grades domains. Such constraining will allow increasing the confidence level in the resource estimate.

Grade capping is an approach commonly used in mineral resource estimate in order to limit/discard bias associated with high grade values. Considering the nature of the mineralization and the pattern of Fe% histograms, Met-Chem determined that grade capping in not required for the resource estimation of the Eagle Island deposit.

14.6 Variogram Modelling

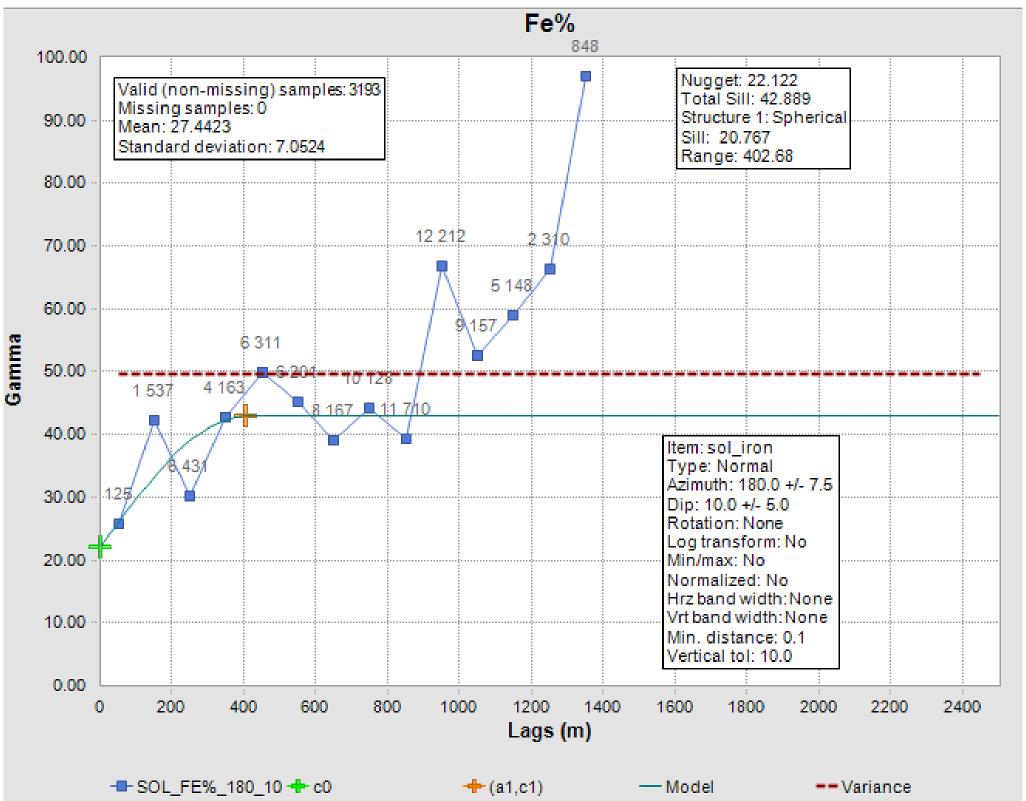
Variograms were generated for the MZ, using the composites raw data, in order to analyse the spatial continuity of the mineralization and determine the suitable parameters for grade interpolation. The module MineSight® Data Analyst – 2.80-03 was used to model all variograms. The MZ has the less complex pattern to allow a geostatistical analysis to be performed without any unfolding process. For this reason, it was elected to analyse the spatial continuity on this zone and apply the resulted parameters for interpolating all zones.

Directional variograms were generated for Fe% in directions corresponding to the major axis (axis of better continuity), the semi-major axis (perpendicular to the major) and the minor axis (in principle perpendicular to the major and semi-major axis). In this case, the longer axis of continuity was found on the strike direction with an azimuth of N180° and a plunge of -10°. The corresponding range is about 400 m. This axis, on the N180° direction, is typical of the North-South oriented portion of the MZ solid. Another axis of relative good continuity was also found with an azimuth of N45° and is typical of the NE oriented portion of the mineralized solid. However, the variogram on the N180° was better defined.

Normally, the semi-major axis should be found on the N270° direction, but all variograms generated in that direction are of poor quality. This is mainly due to insufficient drilling across the dip direction and to extreme deviations of most holes drilled. In fact, many holes started with a high dip (-50° to -60°) but were completed after having being extremely flattened (-20° to -30°). The only fairly good variogram found in the dip direction was with an azimuth of N255° and a plunge of -80°. The corresponding range was about 300 m. It was not possible to directly define a relevant variogram on the minor axis because of holes' high deviations. The alternative was to consider the combined down-hole variogram as representative of the minor axis.

Figure 14.5 and Figure 14.6 show experimental variograms against model variograms for the strike direction (major axis), the direction N255° (assumed semi-major axis) and the down-hole direction.

Figure 14.5 – % Fe Variogram Across the Strike Direction



In conclusion, the search ellipse parameters determined for grade interpolation are as follows; 400 m in the major axis, 300 m in the semi-major axis and 30 m in the minor axis. Due to its geometrical complexity, the Eagle Island deposit was subdivided into different structural domains in each zone. This is to allow the search ellipse to be oriented according the main orientation of each domain in such a way that all blocks are properly coded during grade interpolation.

Due to the iron high variability on the SEZ it is possible that variograms on this zone would have shorter ranges than those obtained on the MZ. However, the tight structural domains defined on this zone, due to its folded nature, represent barriers where the search ellipse is constrained, no matter its size. The definition of structural domains is discussed in Section 14.9.

Figure 14.6 – % Fe Variogram on N255°, Plunge of -80° (assumed as the dip direction)

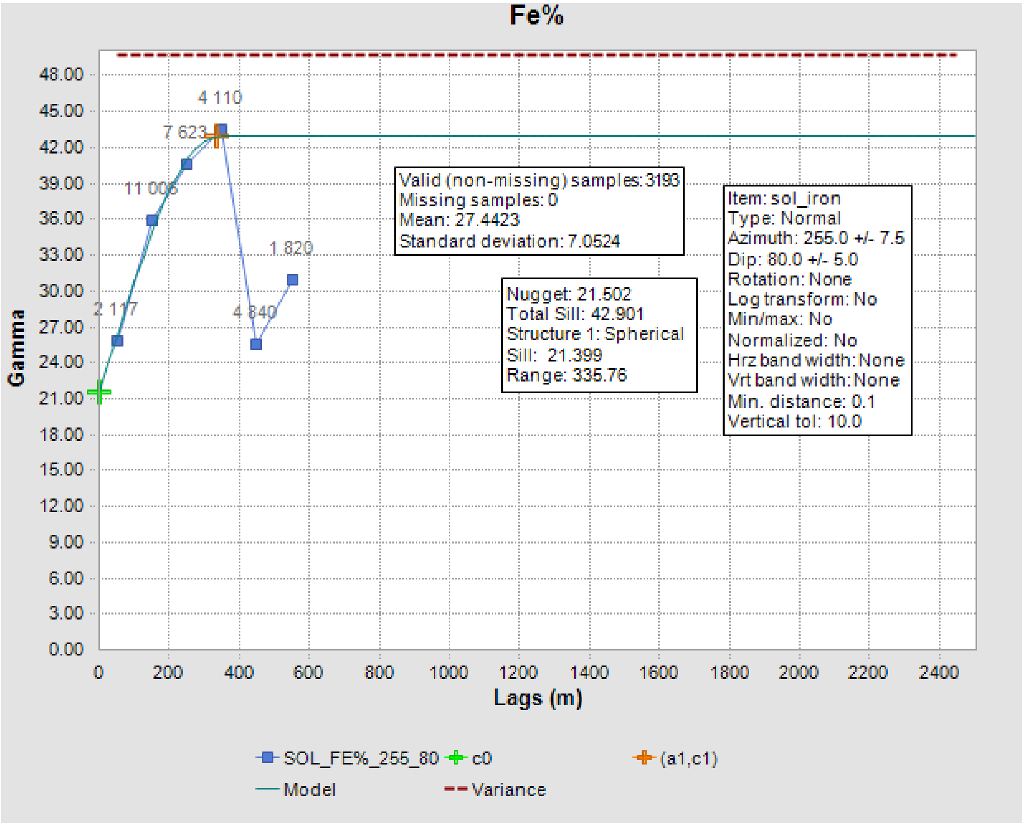
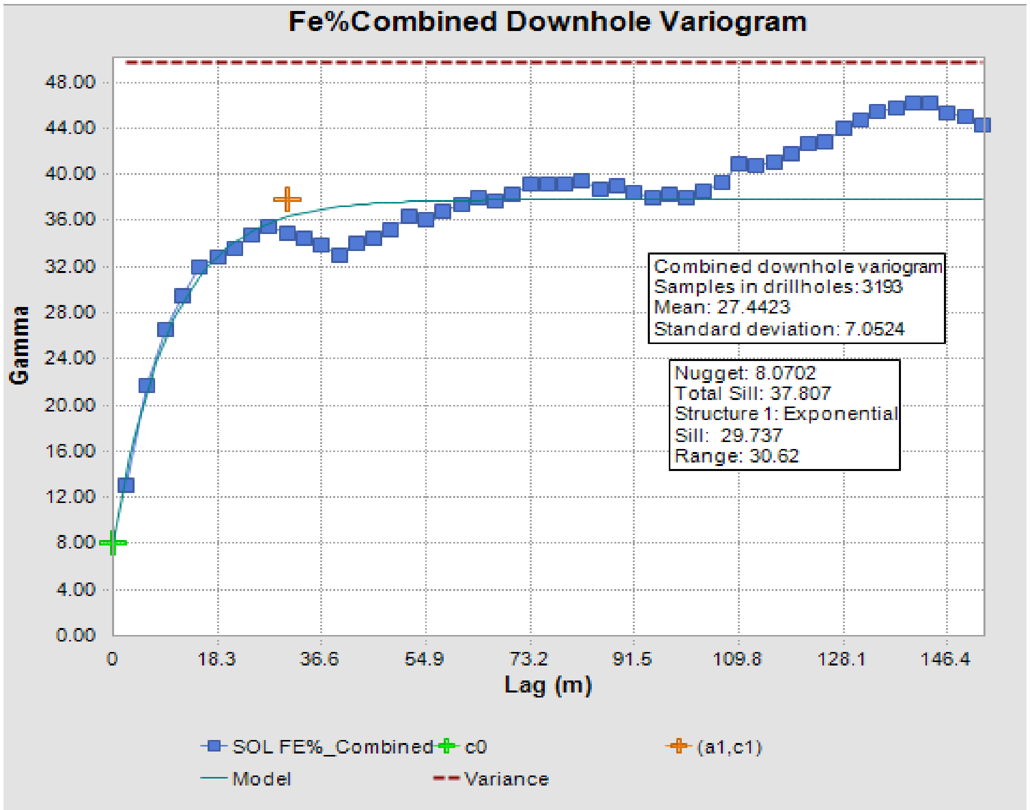


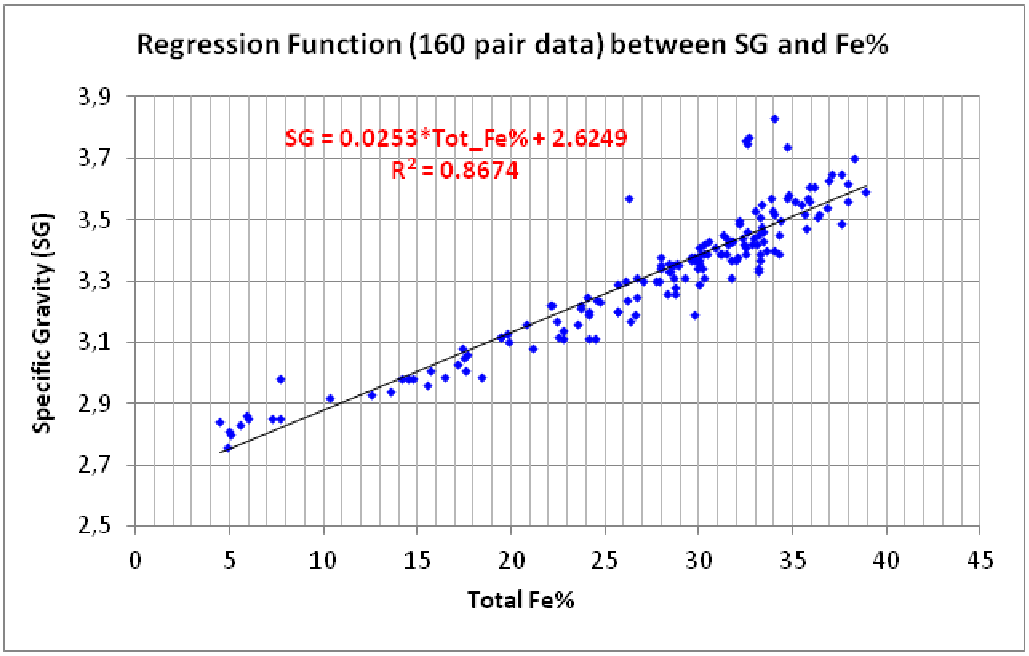
Figure 14.7 – Fe% Combined Down Hole Variogram



14.7 Density/Specific Gravity

Specific Gravity is discussed in details in Section 12.5.8 (Mineralisation) of this Report. For the current mineral resource estimate, Met-Chem created a regression model between density and the iron content. The regression model was built using 160 results of SG measurements performed on selected pulps using the pycnometer method. Figure 14.8 displays the scatter diagram and the regression equation. The specific gravity shows a good correlation with the iron content.

Figure 14.8 – Regression between SG and Fe%



In its previous resource estimate, WGM built a regression model based on the raw data available at that time (65 pair data) and came up with a very similar regression equation (SG = 0.0275 × % TotFe + 2.5373).

14.8 Block Model Setup/Parameters

A block model was created using MineSight® software package to generate a grid of regular blocks for estimating tonnes and grades. A unique block model was created for both MZ and SEZ. In the estimate of 2011, WGM considered a block size of 25 m × 25 m × 25 m respectively in the X, Y and Z directions. Met-Chem is of the opinion that such a size appears a little bit too small comparatively to the drilling spacing. An industry standard is to consider block size in the range of one half (½) to one fourth (¼) of the average drilling spacing. Block size is particularly a sensitive parameter for estimates based on geostatistical methods such as kriging. In this case, the kriging variance is intimately related to the distance of the center of block being estimated to the composites involved in its interpolation. The smaller the blocks, the higher the kriging variance will be. Furthermore, even for estimates not based on geostatistical methods such as Inverse Distance Method ("**IDW**"), a too small block size would lead to estimates that did not reflect the confidence provided by the drilling spacing.

The average drilling spacing computed by Met-Chem is 233 m between holes on the MZ and 169 m between holes on the SEZ. This leads to an average of around 200 m between holes when both zones are considered together. For the X and Y directions, Met-Chem decided to consider a size of 50 m × 50 m which corresponds to one fourth (¼) of the average drilling spacing. A height of 10 m was considered in the Z direction to align with the projected type of mining equipment. The specific parameters used for the block modelling are summarised in Table 14.8.

Table 14.8 – Eagle Island – Blocks Model Parameters

Direction	Minimum (UTM)	Maximum (UTM)	Bock Size	Number of Blocks	Model Origin (UTM)
Easting (X)	628,000	640,000	50	240	628,000
Northing (Y)	5,645,000	5 650,000	50	100	5,645,000
Elevation (Z)	-200	450	10	65	-200
Rotation	N/A	N/A	N/A	N/A	N/A

14.9 Structural Domains for Interpolation

Due to the deformed nature of the mineralization on the MZ and SEZ of the Eagle Island deposit, it was necessary to define structural domains in order to allow the search ellipse to be adequately oriented and all blocks to be properly coded during resource interpolation. Ten (10) structural domains were necessary for this. The parameters of the structural domains are presented in Table 14.9.

Table 14.9 – Parameters of Structural Domains

	Domains	Azimuth (^{0})	Dip (^{0})
Main Zone	MZ_1	70	-84
	MZ_2	55	-65
	MZ_3	0	-65
	MZ_4	330	-65
South East Zone	SEZ_1	255	-85
	SEZ_2	230	-80
	SEZ_3	20	-86
	SEZ_4	335	-85
	SEZ_5	250	-71
	SEZ_6	310	-70

14.10 Resource Interpolation

The resources of the Eagle Island deposit were estimated using the Inverse Distance Squared Method (“**IDW2**”) which, in its basis formulation, belongs to the non geostatiscal estimation methods. However, the search ellipse anisotropy was taken into account, which makes the estimation methodology closer to the kriging method. In kriging estimation, the estimate of a block is a linear combination of all surrounding composites that are selected. In this linear combination, the weight of each composite is a function of its distance to the block center and the quality of the variogram, range and nugget effect, in the related direction.

In the approach that was used, the weighting factor is a function of the distance from the block center to the composites where closer composites have more weight. The consideration of the ellipse anisotropy attributes more weight on composites situated in the better axis of continuity. Met-Chem is of the opinion that IDW methods give estimates similar to geostatistical methods in the case of continuous sedimentary deposits such as Banded Iron Formation ("**BIF**").

Three (3) interpolation passes were used in the estimation. Except for the vertical component for the third pass, the basis search ellipse was kept the same for all passes while the minimum number of composites, and consequently the minimum number of required holes, was relaxed from one pass to the next one. Interpolation parameters are summarized in Table 14.10.

Table 14.10 – Interpolation Parameters

Items	Description		
Grade Interpolation Method	IDW2		
Composites	By fixed length of 3.05 m (10 feet), discarding composites < 1.5 m		
High Values Capping	N/A		
Search Method 1: Octant	Maximum of 10 composites per Octant		
Ellipse Orientation	Depending of related structural domain (See Table 14.11)		
Interpolation Pass	**Pass 1**	**Pass 2**	**Pass 3**
Min. Number of Composites/Block	9	6	3
Max. Number of Composites/Block	15	15	15
Max. Number of Composites/Hole	3	3	3
Ellipse Size on the Major Axis (Strike)	400 m	400 m	400
Ellipse Size on the Semi-Major Axis (Dip)	300 m	300 m	300
Ellipse Size on the Minor Axis (Downhole)	30 m	30 m	60 m

Table 14.12 and Table 14.13 show, for the MZ and SEZ, the comparison between Fe% average for assays, composites and interpolated blocks. The iron average is well repeated in the block model for the Main Zone. The iron average for the SEZ is slightly higher than the average of composites. This is due to the iron high variability in this zone as already discussed in the previous Section.

Table 14.11 – Structural Domains for Resources Interpolation

	Domains	Azimuth (^{0})	Dip (^{0})
Main Zone	MZ_1	70	-84
	MZ_2	55	-65
	MZ_3	0	-65
	MZ_4	330	-65
South East Zone	SEZ_1	255	-85
	SEZ_2	230	-80
	SEZ_3	20	-86
	SEZ_4	335	-85
	SEZ_5	250	-71
	SEZ_6	310	-70

Table 14.12 – Fe% Comparison for Assays, Composites and Blocks on Main Zone

	Fe (%)
Assays	27.45
Composites	27.47
Blocks	27.76

Table 14.13 – Fe% Comparison for Assays, Composites and Blocks on South East Zone

	Fe (%)
Assays	27.04
Composites	27.07
Blocks	28.37

14.11 Resource Classification

Mineral Resource classification is based on certainty of geology and grades and this is, for BIF, in most cases related to the drilling density. Areas more densely drilled are usually better known and understood than areas with sparser drilling which could be considered to have a lower confidence level. However, in some rare cases, even a tight drilling may not allow having certainty on grades continuity. This is particularly the case of deposits showing high variability on grades and high nugget effect.

Met-Chem has considered the following factors for the resource classification of the Eagle Island deposit:

- The ratio hematite/magnetite which is variable in the deposit but remains still not well understood;
- The high variability of iron in the SEZ which affects the quality of the estimates in that zone;
- The localisation of Algoma's historical holes that has to be verified/confirmed through extensive field work;
- The QA/QC program of the drilling campaign of 2011 which did not strictly adhere to a full QA/QC program (no standards, no duplicates);
- The mixed nature (% SolFe and % TotFe) of iron (%Fe) that was interpolated, even though there is a good correlation between both of them.

Taking all of these factors into account, Met-Chem found it to be appropriate to classify all blocks estimated during the first and second passes as Indicated Mineral Resources. Blocks estimated in the third pass are classified as Inferred Mineral Resources.

14.12 Mineral Resource Statement

Mineral Resources are stated using a Fe cut-off of 10%. The cut-off used is related to actual market conditions which provide reasonable prospect for economic extraction at that cut-off. The cut-off grade of 10% was calculated using the economic parameters from Section 16.0 in this Report. A block of iron mineralization that has a grade of 10% will generate zero revenue after paying for mining and processing.

Table 14.14 – Indicated Resources

Cut-off 10% Fe	Indicated Resources (Mt)	Fe (%)
Main Zone	1,086	28.39
South East Zone	201	28.40

Table 14.15 – Inferred Resources

Cut-off 10% Fe	Inferred Resources (Mt)	Fe (%)
Main Zone	83.2	30.21
South East Zone	25.1	33.74

Met-Chem is unaware of any legal, political, environmental, or other risks that could materially affect the potential development of the Mineral Resources.

Due to the uncertainty attached to Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

However, it is important to note that the estimated resources in the Inferred Resources category for the Property, only represents a small percentage (7.7%) of the total resources.

15.0 MINERAL RESERVE ESTIMATES

Since this Project is at a Preliminary Economic Assessment Level, the CIM guidelines on NI 43-101 reporting do not allow the stating of "Mineral Reserves". Mineral Reserves must be supported by either a preliminary feasibility study or a feasibility study.

16.0 MINING METHODS

Met-Chem evaluated the potential for an open pit mine at Eagle Island to produce 6 Mt of iron pellet feed per year. This section of the Report discusses the pit design, mine plan and fleet requirements that were estimated for the PEA and which form the basis for the Mine Operating and Capital Cost estimate presented in Section 21 of this Report.

The mining method selected for the Project is a conventional open pit drill and blast operation with rigid frame haul trucks and hydraulic shovels. Vegetation, topsoil and overburden will be stripped and stockpiled for future reclamation use. The mineralization and waste rock will then be drilled, blasted and loaded into haul trucks with hydraulic shovels.

In order to access the pit, a 1.3 km long causeway will be constructed to connect the south shore of Lake St. Joseph to Eagle Island. A series of dykes will also be constructed to permit dewatering of the mineral resources that lie beneath the lake.

The mine will operate year round, 365 days per year, 24 hours per day. The mine fleet requirements and manpower are based on this work schedule. Figure 16.1 provides a general layout of the mine.

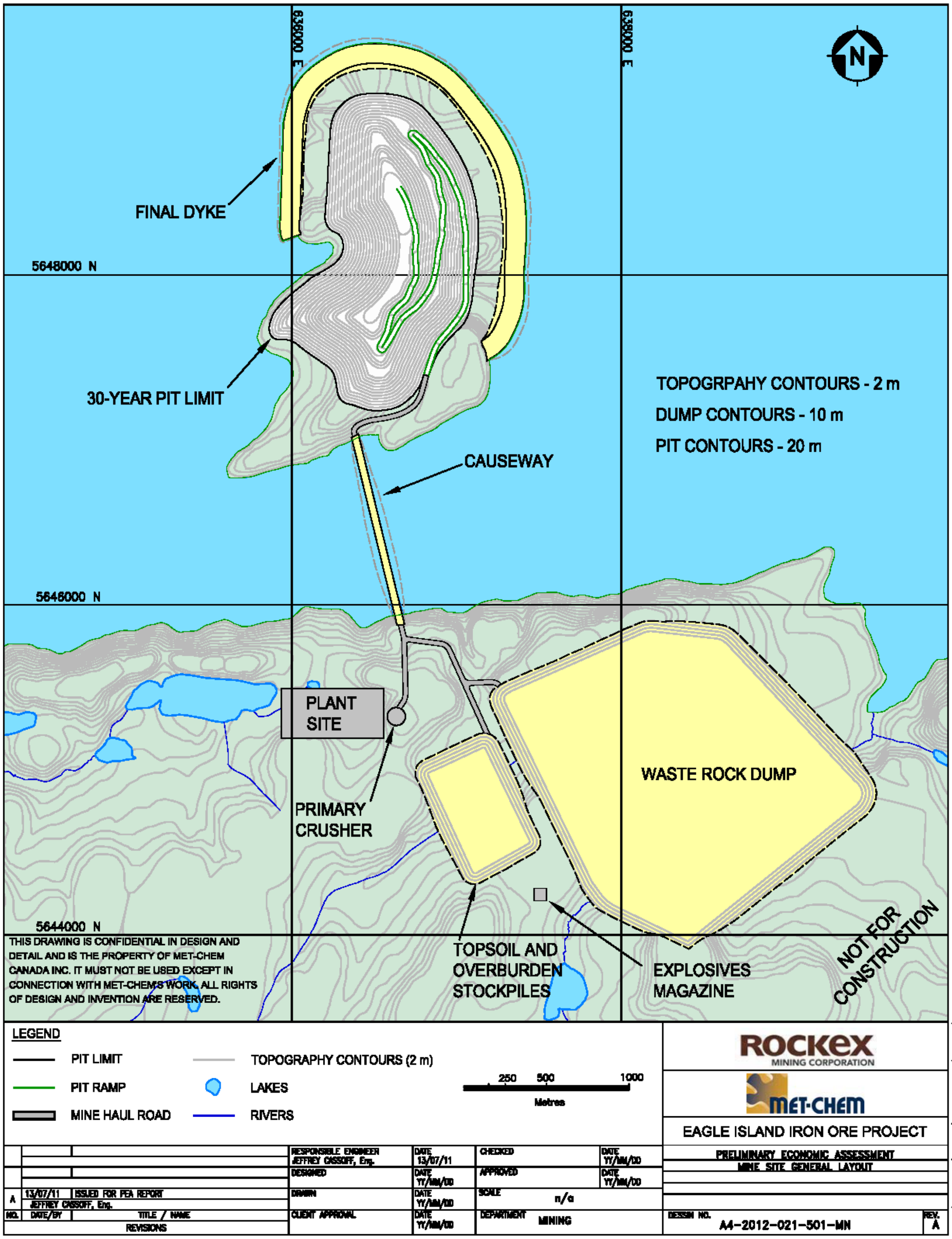
All of the pit design and mine planning work for this PEA was done using MineSight® Version 7.8. MineSight® is commercially available software that has been used by Met-Chem for the past 25 years.

16.1 Block Model

The 3-dimensional geological block model that was used to develop the mine plan was prepared by Met-Chem and was discussed in Section 14 of this Report. The block model is composed of blocks that are 50 m × 50 m × 10 m high. For each block containing mineralized material, the model includes the percentage of iron, the density as well as the resource classification (measured, indicated or inferred).

Using information supplied by Rockex, Met-Chem created a wireframe surface to represent the topography. This topographic surface accounts for the elevations at the bottom of the lake and on Eagle Island. Using data from the drill holes, Met-Chem created a wireframe surface to represent the contact between the overburden and bedrock. Overburden is defined as loose sand and gravels that can be excavated without the need for drilling and blasting.

Figure 16.1 – Mine General Layout



16.2 Pit Optimization

Open pit optimization was conducted on the deposit to determine the pit shell that results in the highest Net Present Value ("**NPV**") for the Project. A series of pit shells was generated using the Lerch Grossman algorithm in the Economic Planner optimizer of MineSight®. These shells were generated by varying the selling price.

The optimization was carried out during the initial stage of the Project using the cost, sales price and pit and plant operating parameters presented in Table 16.1. These parameters are preliminary estimates for developing the economic pit and should not be confused with the operating costs subsequently developed for the PEA and given in Section 21.2. The pit optimization was re-evaluated after a preliminary mine plan was completed and the cost, sales price and pit and plant operating parameters were better defined.

Since this Study is at a PEA level, NI 43-101 guidelines allow Inferred Mineral Resources to be used in the optimization and mine plan.

Table 16.1 – Pit Optimization Parameters*

Item	Value	Units
Mining Cost	3.00	$/t (mined)
Processing Cost	9.00	$/t (milled)
Pellet Feed Transport Cost	3.25	$/t (conc.)
G&A and Infrastructure Cost	2.00	$/t (conc.)
Sales Price (FOB Sioux Lookout)	105	$/t (conc.)
Mill Recovery	80.0	%
Concentrate Grade	66.3	%
Overall Pit Slope	48	Deg
Discount Rate	8	%

* The cost parameters are preliminary estimates for developing the economic pit and should not be confused with the operating costs subsequently developed for the PEA and given in Section 21.2.

16.2.1 Pit Optimization Results

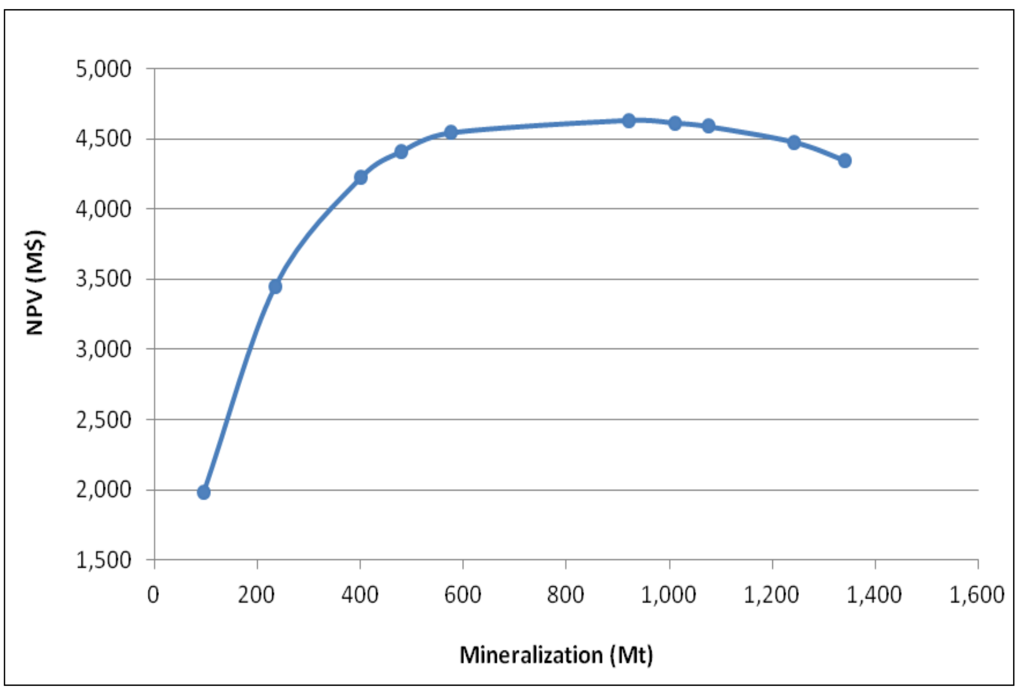
Table 16.2 presents the tonnages and grades that are associated with each of the 10 pit shells. The NPV was calculated for each shell based on the parameters presented in Table 16.1. Figure 16.2 is a chart showing the NPV vs. the mineralized tonnage for each shell.

Table 16.2 – Pit Optimization Results

Pit Shell	Mineralization (Mt)	Fe (%)	Waste[1] (Mt)	Strip Ratio	Mine Life (y)	NPV[2] ($M)
PIT01	96	32.7	11	0.11	7	1,983
PIT02	235	31.6	28	0.12	15	3,452
PIT03	401	30.7	62	0.15	25	4,224
PIT04	480	30.5	87	0.18	30	4,411
PIT05	575	30.2	128	0.22	35	4,545
PIT06	922	29.4	341	0.37	55	4,634
PIT07	1,010	29.3	427	0.42	60	4,616
PIT08	1,077	29.2	501	0.47	64	4,590
PIT09	1,243	28.9	773	0.62	73	4,478
PIT10	1,342	28.6	1,063	0.79	78	4,348

1 – The pit shells do not contain an access ramp therefore the waste quantity will increase once the pit design parameters are applied.
2 – The NPV is calculated strictly on operating costs and selling price. It does not account for the capital and sustaining costs.

Figure 16.2 – Pit Optimization Results



The pit optimization results show that the NPV for the Project does not increase much beyond PIT04. This pit shell contains 480 Mt of mineralization which results in roughly a 30-year mine life. The optimized pit shell does not account for mining dilution and does not include an access ramp. These items are discussed in the Mine Design Section of this Report. Upon completion of the PEA, Met-Chem confirmed that the pit optimization exercise was still valid using the updated cost estimate developed in the Study.

Figure 16.3 shows an isometric view of PIT04. Figure 16.4 presents a typical section through the deposit showing the 10 pit shells.

Figure 16.3 – Isometric View of PIT04

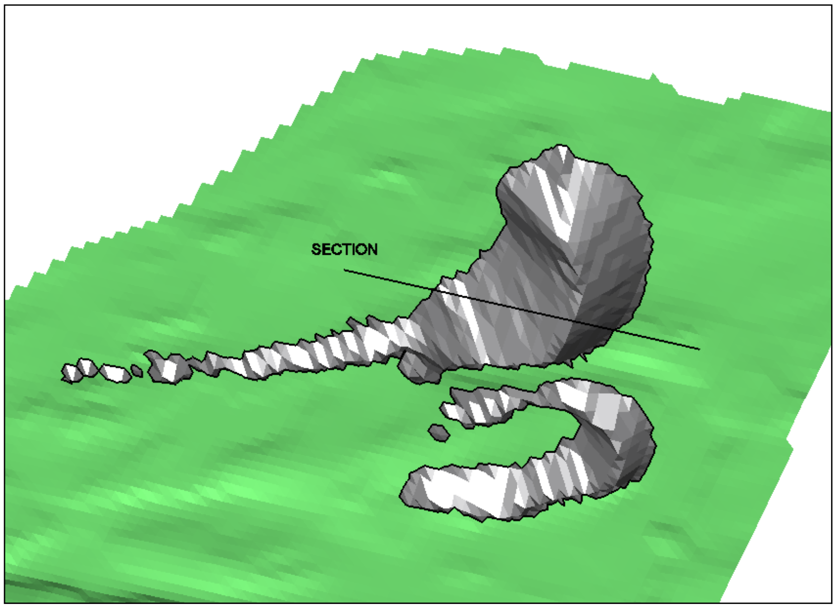
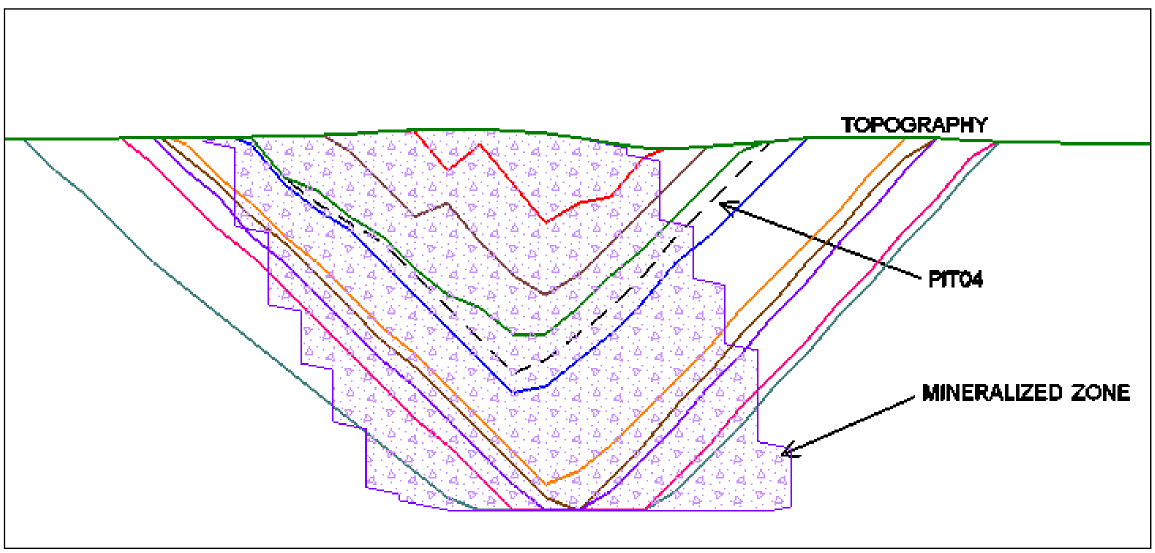


Figure 16.4 – Typical Section with Pit Shells



16.2.2 Cut-Off Grade

Using the economic parameters presented above, Met-Chem calculated a cut-off grade of 10% Fe for the Eagle Island Project. The cut-off grade is used to determine whether the material being mined will generate a profit after paying for the processing, transportation and G&A costs. Material that is mined below the cut-off grade is sent to the waste dump.

16.3 Mine Design

Met-Chem designed a pit that followed PIT04 from the pit optimization and targeted a 30-year mine life for the Project at a production rate of 6 Mt of pellet feed per year. The following section provides the parameters that were used for the detailed pit design.

16.3.1 Material Properties

Table 16.3 defines the material properties used for the mine design and mine plan. The density for the mineralized material is a function of the Fe grade and was discussed in Section 14 of this Report. The remaining parameters such as the overburden and waste rock densities as well as the moisture content and swell factor were taken from Met-Chem's internal database. These properties are important for determining the mine equipment fleet requirements.

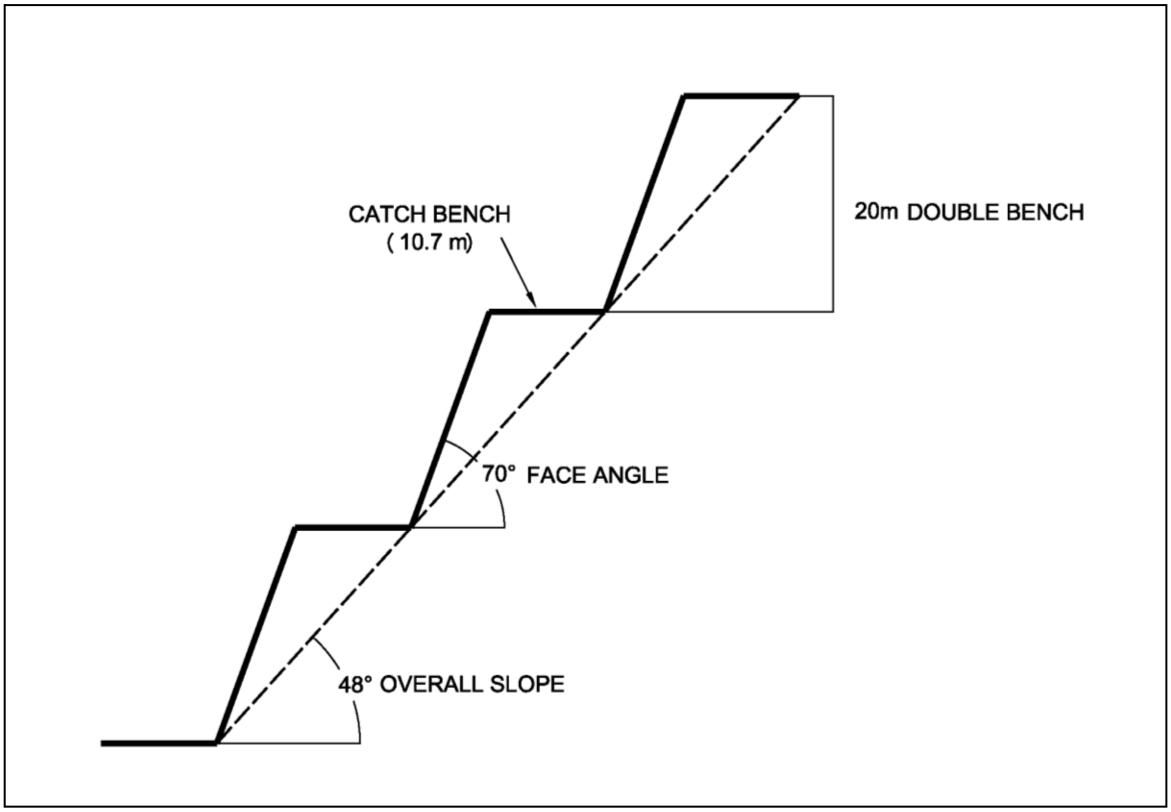
Table 16.3 – Material Properties

Material Type	In-Situ Dry Density (t/m^3)	Moisture Content (%)	Swell Factor (%)
Overburden	2.10	2	30
Waste	2.70	5	30
Mineralization	2.80 – 3.50	5	30

16.3.2 Geotechnical Pit Slope Parameters

Met-Chem used an overall pit slope of 48° for the final pit walls. The final pit wall includes a 10.7 m catch bench for every two (2), 10 m high benches and accounts for a 70° face angle. This design is based on Met-Chem's internal database for similar deposits. Met-Chem recommends a complete pit slope analysis if the Project advances to the pre-feasibility stage. The pit wall configuration is illustrated in Figure 16.5. A minimum mining width of 50 m has been considered in the pit design.

Figure 16.5 – Pit Wall Configuration



16.3.3 Haul Road Design

The ramps and haul roads were designed with an overall width of 30 m. For double lane traffic, industry practice indicates the running surface width to be a minimum of three (3) times the width of the largest truck. The overall width of a 218 tonnes rigid frame haul truck is 8.3 m which results in a running surface of 25 m. The allowance for berms and ditches increases the overall haul road width to 30 m.

A maximum ramp grade of 10% was used. This grade is acceptable for a 218 tonnes rigid frame haul truck.

16.3.4 Lake Elevation

The current water level in Lake St. Joseph is 373 m (1,223 ft) above sea level. Since the water level of the lake is controlled at the Root River Dam, a letter provided by Ontario Hydro to the previous owner of the property, Algoma Steel, in 1969, states that the water level will not be raised above 375 m (1,230 ft).

The pit, dykes and causeway for the PEA were designed to an elevation of 377 m (1,236 ft) to account for a two (2) m buffer above the Ontario Hydro elevation.

16.3.5 Causeway Design

A causeway will be constructed in order to access Eagle Island from the south shore of Lake St. Joseph. The causeway will be built during site development using waste rock from the pit area (equipment will be brought to the island with a barge) as well as from material excavated during the construction of the plant site. The causeway has been designed with a top width of 45 m and 34° side slopes (1.5H:1V). A minimum width of 45 m is required for a 218 tonnes haul truck to turn around and position to dump safely. The causeway does not require a cut-off wall to prevent seepage since it will not be used as a containment dyke.

The causeway that has been designed for the PEA is 1.3 km long. The causeway begins at the 390 m elevation on the mainland and includes a 5% ramp to reach the 377 m elevation. A total of 1.9 Mm^3 of fill is required to build the causeway.

The causeway will be used to haul the mineralization from the pit to the primary crusher which will be located on the south shore. There is an opportunity in the next phase of the Project to evaluate the merits of relocating the primary crusher to the island. This will reduce the haul truck requirements. The crushed rock can then be transported over the causeway via a conveyor.

16.3.6 Dyke Design

In order to access enough mineral resources for the Project to be viable, a series of dykes will be constructed in the lake. The dyke concept and design are based on discussions between Met-Chem and Bauer Resources Canada Ltd. Bauer was involved in the construction of the A154 and A514 dykes at the Diavik diamond mine in the Northwest Territories. In the next phase of the Project, a geotechnical study should be carried out to confirm the assumptions used and to validate and optimize the dyke design. Due to the lack of geotechnical and hydrogeological information available at the time of this Study, Met-Chem does not guarantee the viability of the dyke design.

The first step in the dyke construction involves placing a silt curtain around the dyke perimeter. The silt curtain is used to prevent fine material that is generated during the construction operation to disseminate into the lake. Once the silt curtain is in place, the lake sediments within the footprint of the dyke will be removed with a dredging operation. This material which is estimated at an average thickness of three (3) m is removed to increase the geotechnical stability of the dyke.

A one (1) m thick filter will be constructed on the downstream side of the dyke. This gravel filter is used to control any seepage that may propagate in the dyke. Once the gravel filter is in place, the mining operation will supply run of mine waste rock to construct the outer shells of the dyke. The outer shells are both designed with a top width of 45 m to accommodate 218 tonnes haul trucks and will be built with 34° side slopes (1.5H:1V). A 10 m wide column between the two (2) outer shells will be filled with granular material. In order to minimize the volume required due to the 34° side slopes, the column of granular material will be built at the same pace as the outer shells. The central column of granular fill will be vibro-compacted in order to increase the consolidation.

Since the glacial till that lies below the footprint of the dyke does not provide the necessary friction to keep the dyke geotechnical stable, it will be removed and replaced with granular material by drilling 0.8 m diameter holes along the length of the dyke. These holes will be drilled with a rotary drill machine using a Kelly system. For this Study it was assumed that the depth of glacial till averages 8 m beneath the dyke.

Curtain grouting will be used in order to close natural fractures and joints in the bedrock. An assumption that curtain grouting will be required every 4.5 m has been used in this Study.

A 0.8 m wide concrete cut-off wall will then be placed in the center of the dyke using a cutter soil mixing machine. The cutter soil mixer injects concrete slurry into the granular column to create the cut-off wall which is designed to seal off any water leakage.

Jet grouting is then applied in order to close any remaining gaps between the bottom of the cut-off wall and the competent surface of the bedrock.

The cut-off wall will then be capped with 1.5 m of sand to prevent any freezing that may detriment the strength of the cut-off wall.

The final step in the dyke construction is to relocate any fish from within the dyke to Lake St. Joseph and to pump out and clarify the water.

The toes of the dykes are designed to be a minimum 150 m from the crest of the pit. In order to delay the construction of the dykes, the pit will be mined in three (3) phases. Phase 1 is mined without the need for any dyking. Phase 2 requires a temporary dyke and Phase 3 requires the final dyke. Figure 16.6 shows a typical section through the dyke. Table 16.4 presents the quantities required to construct the dykes and causeway. The construction schedule is discussed in the mine planning section of this Report.

Although the design and location of the dykes ensure that the resources can be mined, there is room for optimization. This optimization can further reduce costs, timing and maximize resource recovery.

Figure 16.6 – Dyke Design

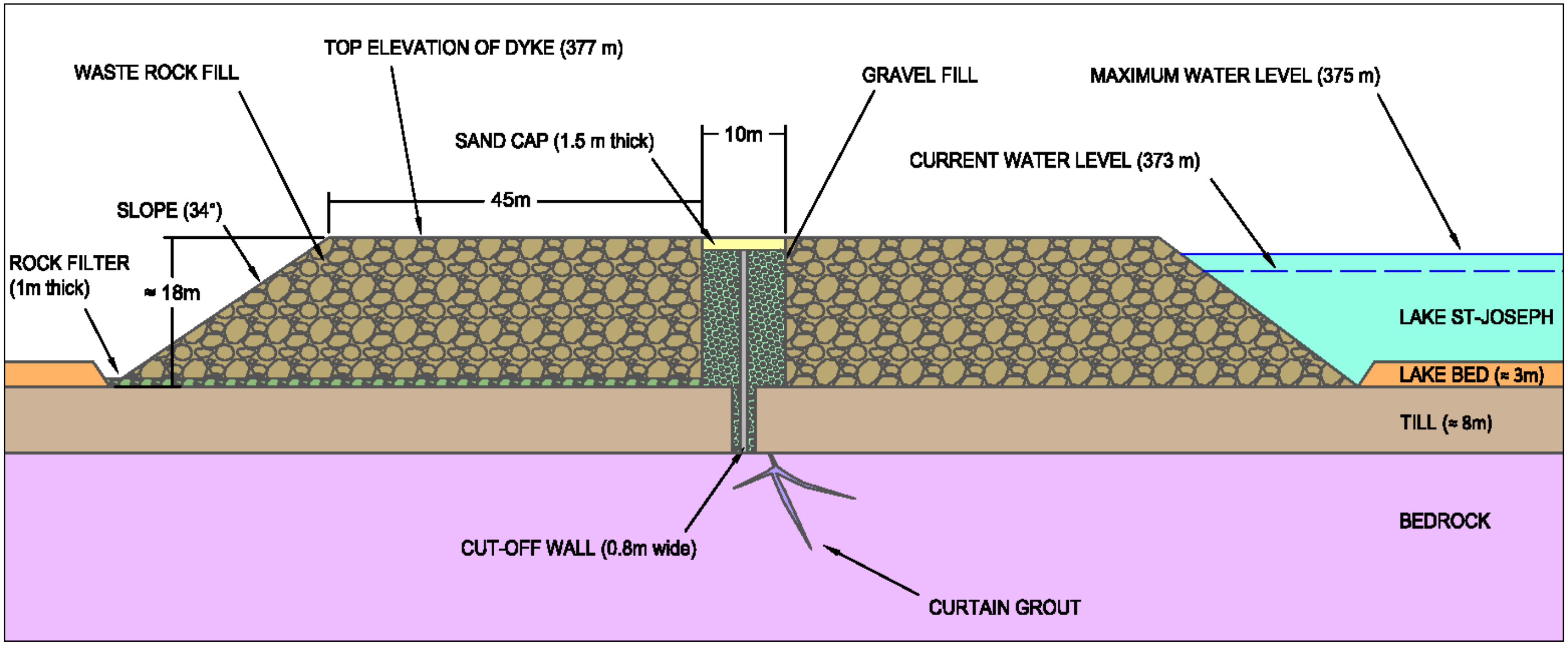


Table 16.4 – Dyke and Causeway Quantities

Description	Length (m)	Filter Rock (m^3)	Dredging (m^3)	Waste Rock (m^3)	Gravel Fill (m^3)	Sand Cap (m^3)	Water to Pump (m^3)	Average Height (m)
Causeway	1,265	n/a	n/a	1,900,000	n/a	n/a	n/a	21.6
Phase 2	1,000	50,000	435,000	2,080,000	200,000	15,000	3,800,000	12.7
Phase 3	3,700	185,000	1,662,000	8,844,000	960,000	55,500	16,500,000	16.5
Total	**5,965**	**235,000**	**2,097,000**	**12,824,000**	**1,160,000**	**70,500**	**20,300,000**	

16.3.7 Mine Dilution

During the mining operation, material at the mineralization and waste rock contacts will not be separated perfectly. A mining dilution factor of 5% at a grade of 0% Fe has been applied to account for this. The Fe grade of mineralized blocks in the model that neighbour waste blocks has been reduced to account for this dilution.

16.3.8 Pit Design

The pit design for the PEA followed the PIT04 pit shell from the pit optimization, targeting a 30-year mine life. In order to minimize the length of dykes required, the pit design concentrated on the north part of the deposit where the ore body is more massive. The southeast and southwest limbs were excluded from the pit design since a considerable amount of dyking is required to mine these resources.

The 30-year pit is approximately 2,000 m long and 900 m wide at surface with a maximum pit depth of 400 m. The total surface area of the pit is roughly 150 ha. The overburden thickness averages 8 m with a range of 0 m to 24 m.

The ramp accesses the pit at the 380 m elevation in the southeast corner. The ramp descends down the east wall and incorporates switchbacks at the 220 m and 80 m elevations. The lowest point in the pit is at the -20 m elevation.

The pit includes 512 Mt of Mineral Resources with an average Fe grade of 28.9% and has a strip ratio of 0.51:1. 26 Mt of overburden and 233 Mt of waste rock are included in the pit. Only 1.4% of the Mineral Resources contained within the pit are in the Inferred category.

As was discussed in the section on dyke design, the pit will be mined in three (3) phases. Phase 1 has been designed to maximize the resource without the need for dykes. The crest of the Phase 1 pit has been designed with a 25 m offset from the 377 m contour on the island. The Phase 1 design mines the resource 110 m deep to the 270 m elevation. Phase 1 contains 54 Mt of resources which can be mined for three (3) years at the planned production rate.

For Phase 2, a one (1) km long dyke is required on the east side of the island. The additional resources contained in the Phase 2 pit include 119 Mt which can be mined for six (6) years at the planned production rate.

For Phase 3, which mines to the 30-year pit limit, a 3.8 km dyke is required around the north end of the deposit. The additional resources contained in the Phase 3 pit include 339 Mt which can be mined for 21 years at the planned production rate. Table 16.5 presents the tonnages and grades for each phase. Figure 16.7, Figure 16.8 and Figure 16.9 are plan views showing the layout of the pit and dykes for each phase.

Table 16.5 – Tonnages and Grades by Phase

Description	Mineralization (Mt)	Fe Grade (%)	Overburden (Mt)	Waste Rock (Mt)	Total Waste (Mt)	Strip Ratio
Phase 1	54.0	27.4	3.4	18.0	21.4	0.40
Phase 2	119.2	26.3	4.5	56.6	61.1	0.51
Phase 3	338.8	30.1	17.7	158.4	176.1	0.52
Total	**512.0**	**28.9**	**25.6**	**233.0**	**258.6**	**0.51**

16.3.9 Dump Design

A waste rock dump was designed on the south shore of Lac St. Joseph to the east of the plant site. The waste dump was designed with an overall slope of 25° to account for the revegetation that is required with the closure plan. The dump has a capacity of 100 million m^3, a top elevation of 430 m and a footprint area of 300 ha. The maximum height of the dump is 50 m.

An area of roughly 50 ha to the west of the waste rock dump has been dedicated for the topsoil and overburden stockpiles. The dump and stockpile layouts are shown on Figure 16.1.

Figure 16.7 – Pit Layout (Phase 1)

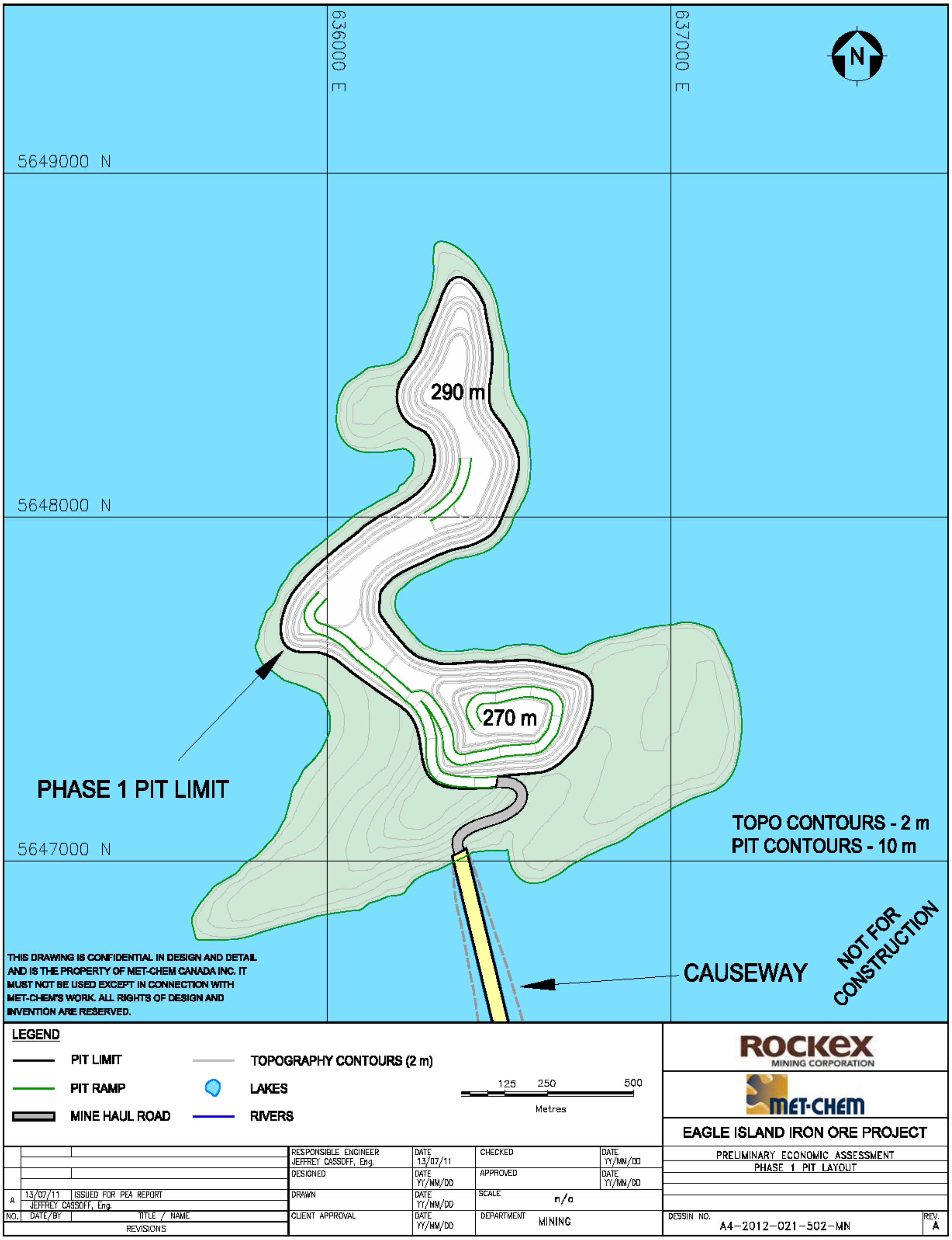


Figure 16.8 – Pit Layout (Phase 2)

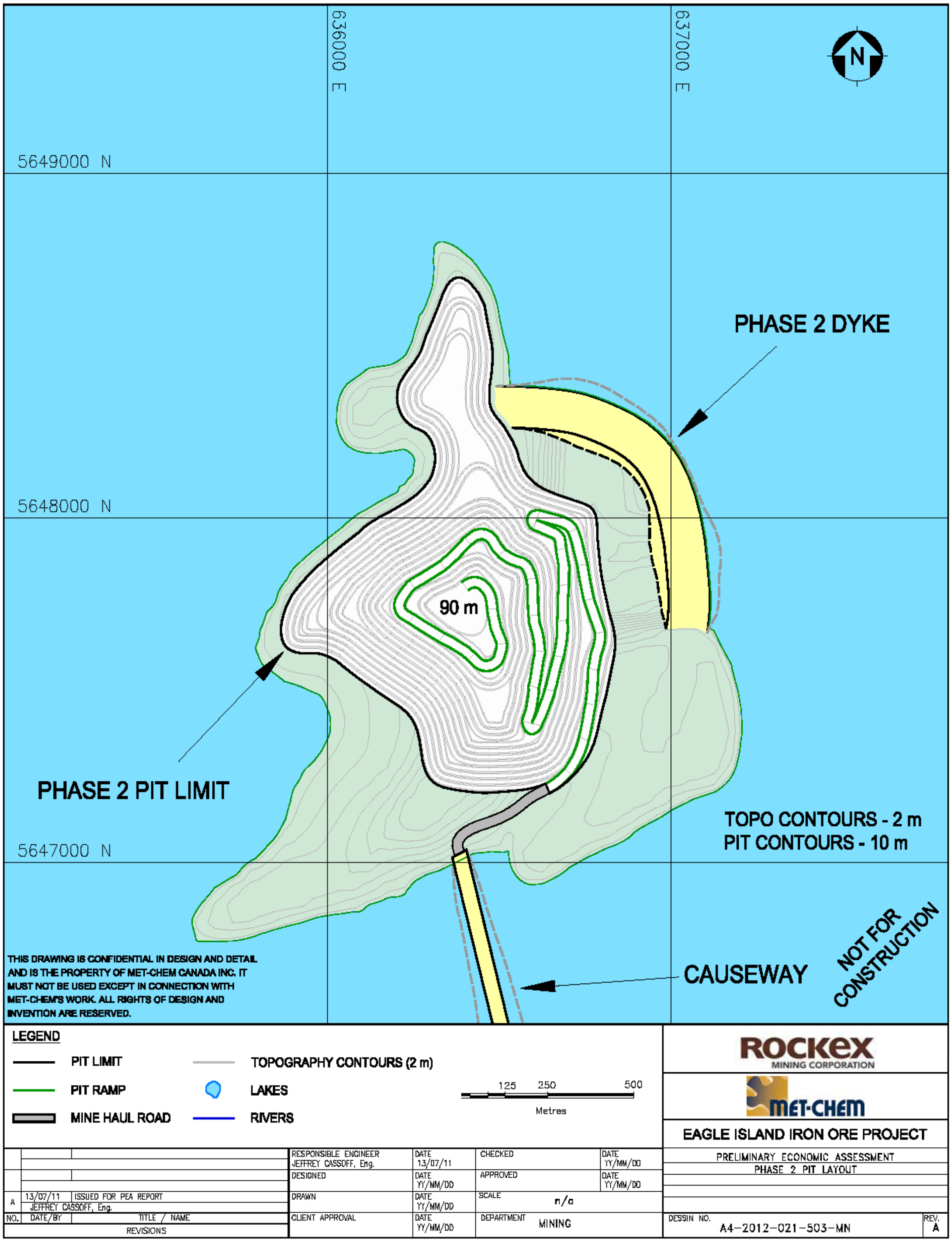
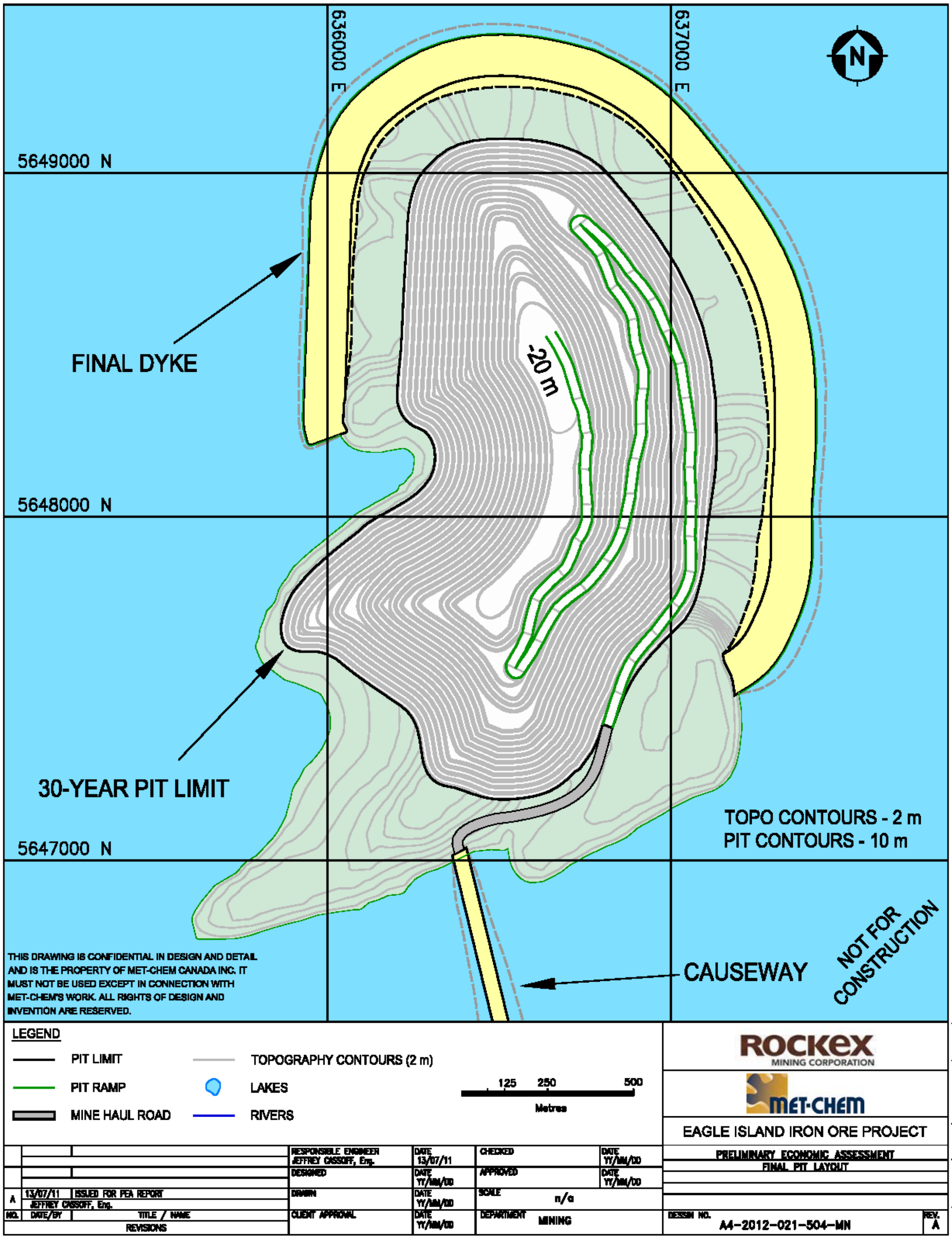


Figure 16.9 – Pit Layout (Final Design)



16.4 Mine Planning

A production schedule (mine plan) was developed for the Eagle Island Project to produce 6 Mt of iron pellet feed per year. Using the mill recovery of 80% and a targeted pellet feed grade of 66.3% results in an average run of mine feed of 17.3 Mtpy at an average Fe grade of 28.9%.

A pre-production phase of one (1) year has been planned to achieve the following objectives:

- Clear vegetation and topsoil;
- Construct the causeway;
- Strip overburden and waste rock to expose the mineralization;
- Stockpile 500,000 t of feed ahead of the crusher.

The mine production schedule was developed annually for the first five (5) years and in five (5) year blocks from Year 6 to 30.

The schedule produces 5.25 Mt of pellet feed in the first year of production which accounts for a plant ramp up of 75% capacity during the first six (6) months. Phase 1 is mined from the start of the operation until Year 3. The first dyke must be complete in the middle of Year 2 so that the area can be dewatered and the pit developed for mining to begin towards the end of Year 2. Mining in Phase 3 will begin in Year 9 so the final dyke must be in place in Year 8. Since the Phase 2 dyke falls within the limits of Phase 3, it must be mined out as rehandle. The Phase 2 dyke was not incorporated into Phase 3 to avoid having a weak spot at the junction of the two (2) dykes.

The mine production schedule is presented in Table 16.6.

Table 16.6 – Mine Production Schedule (in '000,000 t)

Description	Units	Pre Prod	Year 01	Year 02	Year 03	Year 04	Year 05	Years 6 – 10	Years 11 - 15	Years 16 – 20	Years 21 – 25	Years 26 – 30	Total
Pellet Feed	**Mt**	**0.0**	**5.3**	**6.0**	**6.0**	**6.0**	**6.0**	**30.0**	**30.0**	**30.0**	**30.0**	**30.0**	**179.3**
ROM to Plant	**Mt**	**0.0**	**16.1**	**18.4**	**17.8**	**18.7**	**19.2**	**92.5**	**82.2**	**82.9**	**82.8**	**81.8**	**512.3**
Fe	%	0.0	27.1	27.1	27.9	26.6	25.9	26.9	30.3	30.0	30.0	30.4	**28.9**
Total Waste	**Mt**	**5.4**	**6.6**	**8.0**	**6.5**	**8.2**	**11.3**	**64.8**	**52.8**	**44.6**	**32.8**	**23.3**	**264.2**
Overburden	Mt	3.4	0.0	4.5	0.0	0.0	8.9	8.9	0.0	0.0	0.0	0.0	**25.6**
Waste Rock	Mt	2.0	6.6	3.6	6.5	8.2	2.4	50.2	52.8	44.6	32.8	23.3	**233.0**
Dyke Rehandle	Mt	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	**5.7**
Total Material Moved	**Mt**	**5.4**	**22.6**	**26.4**	**24.3**	**26.9**	**30.5**	**157.3**	**135.0**	**127.5**	**115.6**	**105.2**	**776.5**
Stripping Ratio[1]		**n/a**	**0.4**	**0.4**	**0.4**	**0.4**	**0.6**	**0.6**	**0.6**	**0.5**	**0.4**	**0.3**	**0.5**

1- The stripping ratio does not include the dyke rehandling.

16.5 Mine Equipment Fleet

The mine will be operated with an owner fleet with the exception of the overburden removal which will be carried out by a contractor. Table 16.7 presents the mine equipment fleet that is required for the Project during peak production. The table identifies the Caterpillar equivalent to give the reader an appreciation for the size of each machine. Fleet selection and requirements are discussed in this Section of the Report.

Table 16.7 – Mining Equipment Fleet

Equipment	Model	Description	Units
Major Equipment			
Haul Truck	CAT 793F	Payload – 218 t	14
Shovel	CAT 6060FS	Payload – 70 (26.5 m^3)	2
Production Drill	CAT MD6420	Hole Diameter – 251 mm	2
Support Equipment			
Utility Loader	CAT 994	Payload – 37 t	1
Track Dozer	CAT D10T	Power – 433 kW	3
Road Grader	CAT 160M	Power – 225 kW	2
Utility Backhoe	CAT 390D	Power – 390 kW	2
Water / Sand Truck	CAT 785	n/a	2
Secondary Drill	CAT MD5125	Hole Diameter – 165 mm	1
Lighting Plant	n/a	8 kW	8
Service Equipment			
Fuel and Lube Truck	n/a	n/a	2
Mechanic Truck	n/a	n/a	4
Tire Handler	n/a	n/a	1
Boom Truck	n/a	Capacity – 22 tonnes	2
Lowboy	n/a	Capacity – 150 tonnes	2
Mobile Crane	n/a	Capacity – 75 tonnes	1
Pick-up Truck	n/a	3/4 tonne	10
Transport Bus	n/a	20 seats	3

16.5.1 Haul Trucks

The haul truck selected for the Project is a rigid frame haul truck with a nominal payload of 218 tonnes. This truck size was selected since it matches well with the production requirements and results in a manageable fleet size. The following parameters were used to calculate the number of trucks required to carry out the mine plan. These parameters result in 5,600 working hours per year for each truck.

- Mechanical Availability – 90%;
- Utilization – 90%;
- Nominal Payload – 218 tonnes (160 m^3 heaped);
- Shift Schedule – Two (2), twelve (12) hour shift per day, seven (7) days per week;
- Operational Delays – 80 min/shift (this includes 15 minutes for shift change, 15 minutes for equipment inspection, 40 minutes for lunch and coffee breaks and 10 minutes for fuelling (fuelling is done once every 2 shifts for 20 minutes);
- Job Efficiency – 90% (54 min/h; this represents lost time due to queuing at the shovel and dump as well as interference along the haul routes);
- Rolling Resistance – 3%.

Haul routes were generated for each period of the mine plan to calculate the truck requirements. These haul routes were imported in Talpac©, a commercially available truck simulation software package that Met-Chem has validated with mining operations. Talpac© calculated the travel time required for a 218 tonnes haul truck to complete each route. Table 16.8 shows the various components of a truck's cycle time. The load time is calculated using a hydraulic shovel with a 26.5 m^3 (70 tonnes) bucket as the loading unit. This shovel size which is discussed in the following section loads a 218 tonnes haul truck in four (4) passes.

Haul productivities (tonnes per work hour) were calculated for each haul route using the truck payload and cycle time. Table 16.9 shows the cycle time and productivity for the mineralization and waste haul routes in Year 5 as an example.

Table 16.8 – Truck Cycle Time

Activity	Duration (sec)
Spot @ Shovel	45
Load Time[1]	180
Travel Time	Calculated by Talpac©
Spot @ Dump	60
Dump Time	60

1. Four (4) Passes @ 45 sec/pass.

Table 16.9 – Truck Productivities (Year 5)

Material	Cycle Times (min)					Productivity	
	Travel	Spot	Load	Dump	Total	Loads/h	t/h
Mineralization	22.00	0.75	3.00	1.50	27.50	2.18	476
Waste	25.50	0.75	3.00	1.50	30.50	1.97	429

16.5.2 Shovels

The main loading machine selected for the Project is a diesel powered hydraulic excavator with a 26.5 m^3 (70 tonnes) bucket. This shovel size is a good match for a 218 tonnes haul truck and is a suitably sized shovel to handle the production requirements as well as the face heights expected.

During peak production, two (2) shovels are required to mine the tonnages presented in the mine plan. A large front end wheel loader capable of loading the 218 tonne trucks has been included in the fleet. This machine will be used as an alternate loading tool and will manage the stockpile rehandling.

16.5.3 Drilling and Blasting

The mineralized material and waste rock will be drilled and blasted. The blast pattern for the Project is presented in Table 16.10. Production drilling will be done using a diesel powered rotary drill with 251 mm (9-7/8 inch) diameter holes. Two (2) drills are required for the Project, assuming a 90% mechanical availability, a 90% utilization and a penetration rate of 25 m/h. During full production there will be roughly two (2) blasts per week each producing approximately 250,000 t.

Table 16.10 – Blasting Parameters

Parameter	Units	Value
Bench Height	m	10
Blasthole Diameter	mm	251
Burden	m	5.3
Spacing	m	6.1
Subdrilling	m	2.3
Stemming	m	4.9
Explosives Density	g/cm^3	1.25
Powder Factor	kg/t	0.36

Blasting will be carried out using bulk emulsion that will be transported to the mine by an explosives supplier. The blasts will be loaded and fired by the mine's blaster. The blasting accessories such as detonators, boosters and cord will be stored in the explosives magazine. The location of the magazine is shown on Figure 16.1.

16.6 Mine Dewatering

For each phase of the mine design, a ditch will be established around the perimeter of the pit to intercept water before it infiltrates into the pit. Rain water and ground water that is collected in the pit will be collected in an in-pit sump and pumped to a settling pond at surface.

A ditch system will be established around the footprint of the waste dump and stockpiles. Water collected in these ditches will be directed to settling ponds. All water that is collected in the ditches and sumps will be treated and sampled prior to discharge into the environment.

Met-Chem recommends that a hydrogeological study be carried out if the Project advances to the pre-feasibility stage. This Study will provide an estimate of the quantity of water that is expected to be encountered during the mining operation.

16.7 Manpower Requirements

The mine workforce for the Project ranges from 104 employees in pre-production to 180 during full production. The mine employees will work on a 2 weeks on, 2 weeks off rotation. Table 16.11 summarizes the mine manpower requirements during peak production.

Table 16.11 – Mine Manpower Requirements

Description	# Employees
Supervision and Engineering	
Mine Superintendent	1
Maintenance Superintendent	1
Pit Foreman	4
Maintenance Foreman	4
Mining Engineer	4
Geologist	4
Surveyor	4
Mine Operations	
Truck Operator	56
Shovel Operator	8
Drill Operator	8
Dozer Operator	12
Grader Operator	8
Water Truck Operator	8
Mechanic	28
Tool Crib Attendant	4
Fuel / Lube Truck Driver	8
Blaster	2
Labourer	8
Utility Operator	8
Total Mine Workforce	**180**

17.0 RECOVERY METHODS

The process design for the Rockex Project is based on the test work performed at SGS and described in Section 13.0 of this Report.

Processing of the Rockex iron mineralization is based on production of an iron concentrate in a facility located at Lake St. Joseph, about 100 km NE of Sioux Lookout, and 350 km NW of Thunder Bay on Lake Superior in Ontario. The concentrate (pellet feed) will be transported by pipeline to Sioux Lookout where the shipping facility will be located. This facility will include slurry reception, filtration, drying (winter months only), storage, reclaiming and loading into rail cars.

The iron in the ROM will be concentrated using gravity separation, magnetic separation and desliming. As determined by test work results, the spiral separators will have a weight recovery of 15.3% while magnetic separators will recover 12.3% and the desliming will produce a further 7.0% for a total of 34.6% weight recovery. The process design is based on the results from metallurgical test work (see Section 13).

The ROM average production will be 17.3 Mtpy to yield 6.0 Mtpy of pellet feed at 66.3% Fe.

Unless otherwise noted, all weight and throughput are in dry tonnes.

17.1 Process Plant

The processing plant flow sheet and design criteria are based on the results from the metallurgical test work, program discussed in Section 13.0 of this Report.

The concentrator has been designed to produce an iron pellet feed grading 66.3% iron and 5.23% SiO_2 from an average feed containing 28.9% iron and 45.5% silica. The beneficiation processes includes crushing, grinding, screening, gravity and magnetic separation and desliming.

At Sioux Lookout, the facility will include filtration, drying and material handling as well as storage and loading of iron pellet feed into rail cars.

A pipeline transports the pellet feed from the mine site to Sioux Lookout.

17.1.1 Process Design Criteria

Both the concentrator and pellet feed dewatering/drying facilities will operate for 24 hours per day, 7 days per week and 52 weeks per year at an expected 90% utilisation.

All throughput rates are based on the production of 6.0 Mtpy of concentrate (pellet feed). The weight recovery of 34.6% is an average figure based on the test work results and may vary depending on the mineralization composition.

Concentrator design capacity is based on an average operating rate of 52,752 tpd, or a nominal throughput rate of 2,198 tph of iron material. The slurry pipeline will operate at a nominal throughput rate of 761 tph of iron pellet feed.

A detailed process design criteria has been developed for the PEA. A summary of the design basis for the crusher, concentrator and the shipping facilities is presented in Table 17.1.

Table 17.1 – Process Design Basis

Parameter	Unit	Value
Total ROM Processing Rate	Mtpy	17.3
Crusher Operating Time	%	65
Nominal Crushing Rate	t/h	3,044
Concentrator Operating Time	%	90
Nominal Processing Rate	t/h	2,198
Shipping Facility Operating Time	%	90
Nominal Concentrate (Pellet Feed) Production Rate	t/h	761
Total Weight Recovery	%	34.6
Spiral Separation Iron Concentrate Production	Mtpy	2.66
Magnetic Separation Iron Concentrate Production	Mtpy	2.13
Desliming Concentrate Production	Mtpy	1.21
Total Iron Concentrate (Pellet Feed) Production	Mtpy	6.00

17.1.2 Flow Sheets and Process Description

Simplified flow sheets for the concentrator is shown in Figure 17.1. Detail flow sheets and layout can be seen in Appendix A. The process is described in the following sub-sections.

a) Crushing and Stockpiling

Run of mine, containing 28.9% iron, 45.5% silica and 5% moisture, is dumped directly into a gyratory crusher by the mine haul trucks. The crusher discharge product has a particle size of 80% less (P_{80}) than 175 mm. The conical crushed material stockpile has a total capacity of approximately 74,000 tonnes and a live capacity of about 30,000 tonnes. The feed is reclaimed by two (2) conveyors, each with three (3) apron feeders. The conveyors discharge onto the SAG mill feed conveyor.

b) Primary Grinding and Classification Circuit

The SAG mill will operate at a pulp density of 65% solids by mass in a closed circuit with two (2) vibrating screens. The screens oversize is conveyed to a diverter, located along the SAG mill feed conveyor, where a part is diverted to feed the pebble mill next to the SAG mill. The majority of the SAG circulating load is returned to the SAG mill fed conveyor along with fresh grinding media. The screen undersize product will have a particle size P_{80} of 1,700 µm that will be pumped to the secondary grinding circuit.

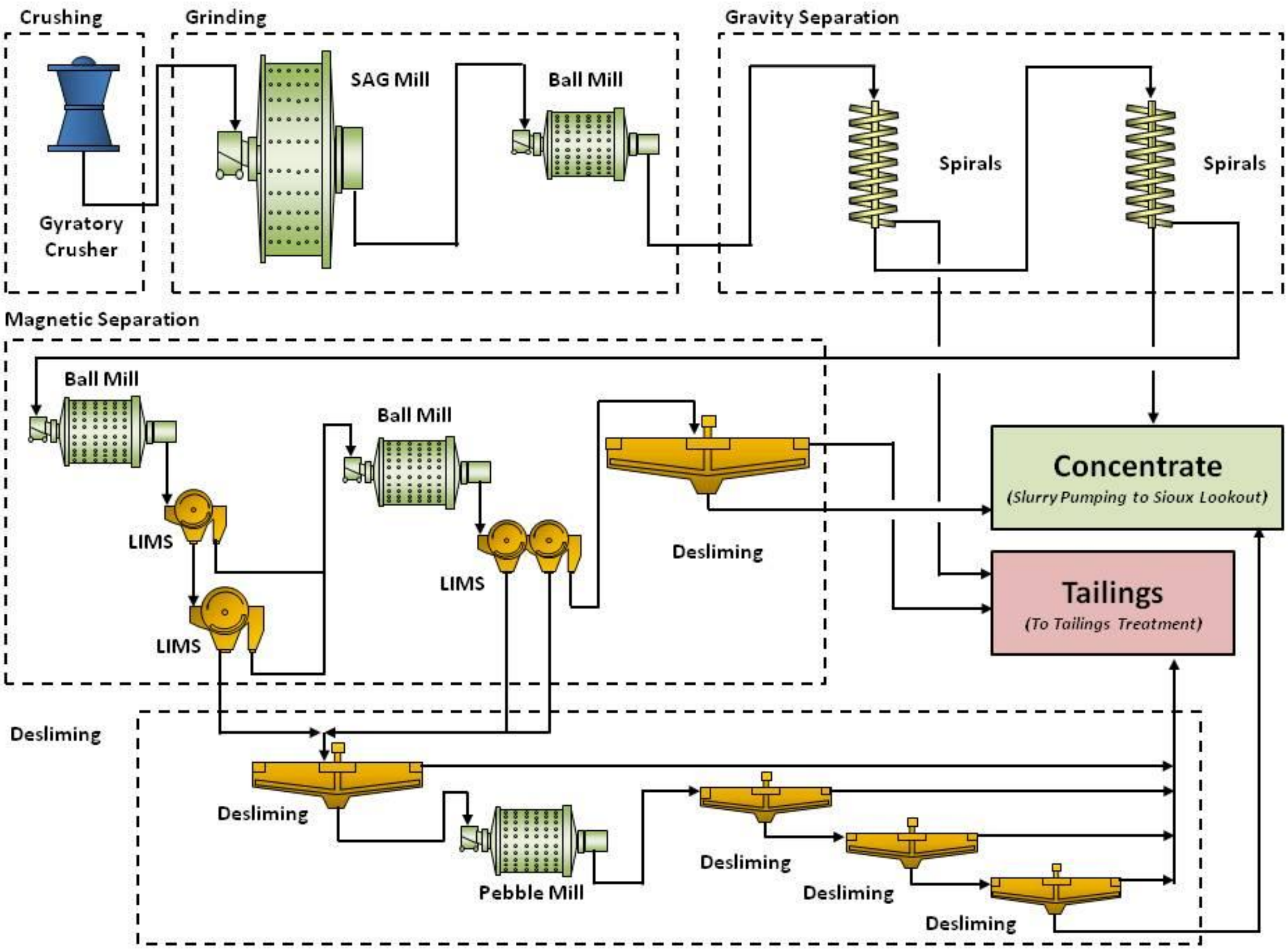
c) Secondary Grinding and Gravity Separation

The SAG mill screen undersize will be pumped to three (3) parallel closed-loop ball mill circuits. The slurry is pre-classified via cyclones, with the cyclone underflow, i.e. the coarse material, reporting to the secondary grinding ball mills. The cyclone overflows are pumped to gravity separation circuits for silica removal.

The cyclone overflow of each ball mill circuit has a P_{80} of 88 µm and is pumped to three (3) gravity separation circuits each composed of two (2) stages of spiral gravity separators, rougher and cleaner. The rougher concentrate will be fed by gravity to the cleaner spirals located directly underneath. The rougher tails are final tails and are pumped to the tailings thickener. The cleaner concentrate is a final concentrate. It is about 44.3% of the total concentrate and has a target grade of 66.5% iron and about 5.0% silica and is pumped to the concentrate thickener and pipeline feed circuit. The cleaner tailings, containing 25.1% iron and 50.5% silica are pumped to the tertiary grinding circuits prior to further beneficiation.

For each of the three (3) ball mill lines, the rougher spirals are grouped in 21 banks of 10 double start spirals for a total of 420 rougher spirals per line or 1,260 for the three (3) rougher circuits. Each cleaner spiral bank is located directly under the corresponding rougher bank but is composed of only eight (8) double start per bank on account of the reduction in tonnage due to the rejection of tails.

Figure 17.1 – Simplified Concentrator Flow Sheet



d) Tertiary Grinding and Magnetic Separation Circuit

The cleaner spiral tails contain magnetite particles that are associated with silica. In order to liberate the particles, the cleaner spiral tails are directed to two (2) tertiary ball discharge pump boxes for further classification via cyclones and regrinding. The cyclone underflows are returned to the two (2) mills while the overflows, with particle size of P_{80} of 27 microns, are directed to 14 rougher LIMS (1.2 m by 3.8 m). The rougher tails are pumped to 12 single drum cleaner magnetic separators for further recovery of iron units.

The rougher and cleaner concentrates are piped to the finisher ball mill where they are mixed with the mill discharge and are pumped to a cyclone cluster. As a final liberation step, the cyclone underflow is reground in the finisher ball mill in closed circuit with cyclone. The cyclone overflow, with a size (P_{80}) of 18 microns, is further concentrated by three (3) double drum finisher LIMS and is pumped to a desliming thickener. The magnetite concentrate from desliming thickener underflow is a final concentrate and is pumped to the final concentrate thickener. The magnetic separation concentrate represents about 35.5% of the total concentrate and will have an average grade of 66.9% Fe and 5.2% silica.

e) Final Desliming

The cleaner and finisher LIMS tails contains unliberated iron oxides. The slurry is conditioned and fed to the primary desliming thickener which separates liberated silicates from the iron oxides via differential settling rates. The silicates, otherwise known as the “slimes”, report to the thickener overflow and are pumped to final tailings, while the denser iron oxides settle out and report to the thickener underflow. The underflow is fed to closed circuit pebble mill. The pebble mill further liberates silicates from the iron oxide particles. The cyclone overflow has a P_{80} of 18 microns and reports to the final three (3) desliming thickeners. Each stage removes further “slimes” which further upgrades the iron oxides which reports to the underflow. The concentrate is pumped to the final concentrate thickener. The desliming circuit concentrate will represent 20.2% of the total concentrate and will have a grade of 64.9% Fe and 5.81% silica.

f) Final Tailings Circuit

The final tailings consist of the combined spirals, magnetic and desliming tails. These are thickened to 50% solids and pumped to the tailings pond located south of the concentrator building. About 80% of the water in the thickened tailings slurry is returned as reclaimed water to the plant. The remaining water is trapped in the tailing or is lost via either evaporation or percolation. The thickener overflow is pumped to the process water tanks. The final tailings have a 8.8% iron and 66.8% silica grade respectfully.

g) Concentrate (Pellet Feed) Thickening and Slurry Pipeline to Sioux Lookout

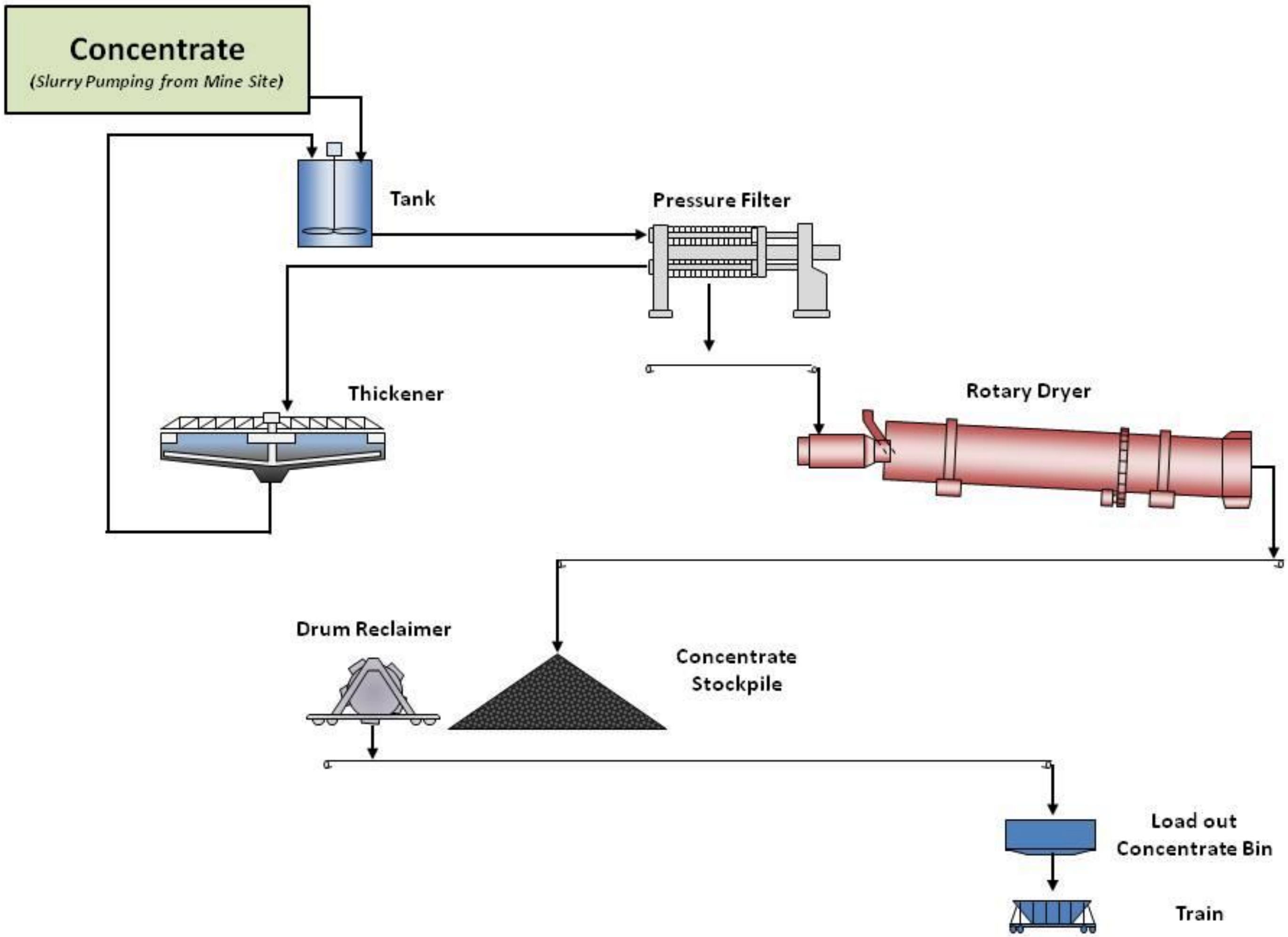
The spiral, magnetic and desliming concentrate will be dewatered to 65% solids in a thickener and stored in two (2) slurry tanks having a combined capacity of about eight (8) hours of plant operation. The iron pellet feed will be pumped to Sioux Lookout, to the filtration, drying and train loading facilities, through a 135 km long slurry pipeline using diaphragm pumps. The pellet feed produced (P_{80} of 37 µm) is fine enough to present no size related problems during pumping.

h) Filtration and Drying at the Sioux Lookout Facility

The Sioux Lookout facility consists of slurry reception, two-stages of water removal, pellet feed storage and railway car loading. The slurry pipeline will discharge via a distributor to two (2) buffer pellet feed storage tanks. In the case of the incoming slurry having a low pulp density, the slurry is redirected to a thickener. The slurry is pumped to two (2) pressure filters. The pressure filter cake will contain approximately 8% moisture. The filtrate is returned via the thickener to the plant process water system with the excess water reporting to a clarifier pond. During the winter months, the filter cake is dried in two (2) rotary dryers to 2% moisture. The dried pellet feed is moved by conveyor to the pellet feed storage facility.

Figure 17.2 shows a simplify flow sheet of the Sioux Lookout facilities.

Figure 17.2 – Simplified Flow Sheet for Sioux Lookout Facility



i) Pellet Feed Storage and Reclamation and Car Loading

An overhead tripper conveyor creates a pellet feed stockpile of 60,000 tonnes representing slightly over three (3) days of nominal operation. This will be stored in a covered facility. The pellet feed is reclaimed using a 3,000 tph drum type reclaimer. The reclaim pellet feed is transported from the stockpile to the car loader by a conveyor system operating at 3,000 tph. The reclaimed pellet feed is loaded in a unit train of 90 cars of 100 tonnes capacity each.

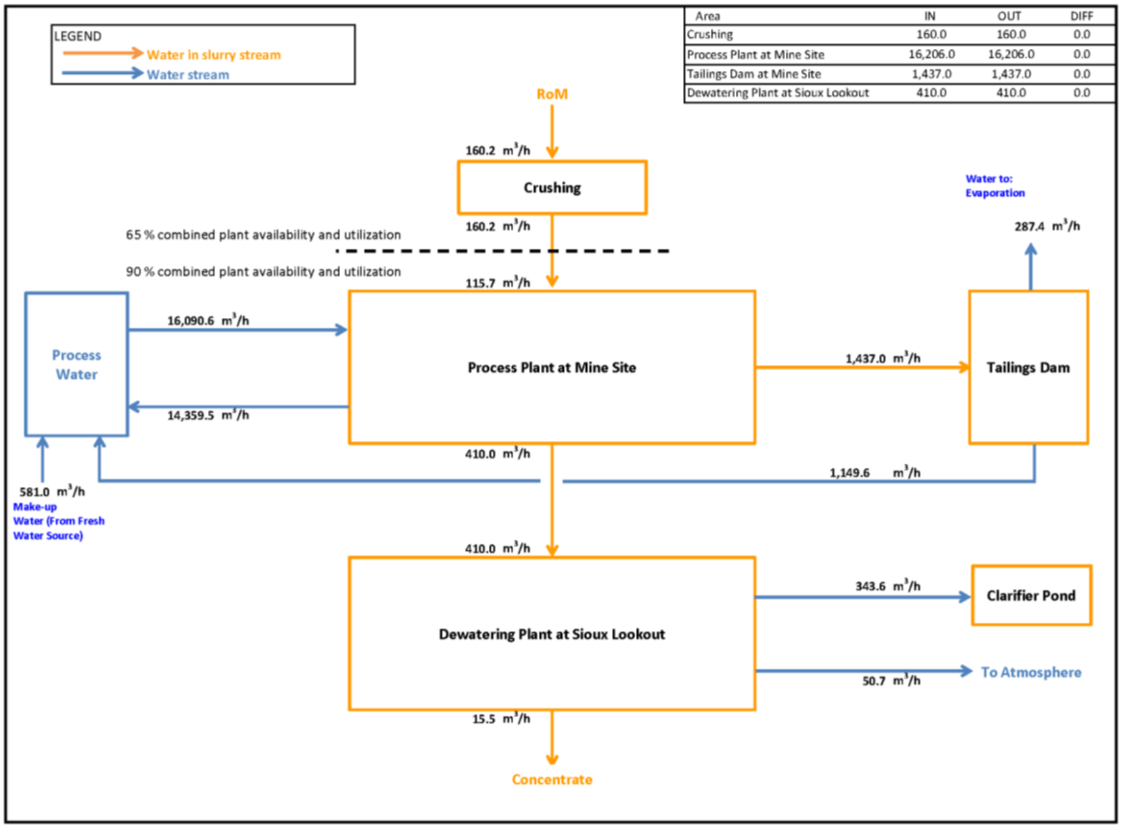
17.1.3 Mass Balance and Water Balance

The process plant mass balance has been calculated based on the developed flow sheet and the process design criteria. Table 17.2 summarizes the process mass balance and Figure 17.4 shows the simplified process water balance.

Table 17.2 – Summary Process Mass Balance

Mass Entering System				Mass Exiting System			
Streams	**Dry Solids (t/h)**	**Water (m^3/h)**	**Total Mass (wet t/h)**	**Streams**	**Dry Solids (t/h)**	**Water (m^3/h)**	**Total Mass (wet t/h)**
ROM to Concentrator	2,198	115.7	2,313.7	Evaporation from Dryers	—	50.7	50.7
Fresh Water	—	581.5	581.5	Final Pellet Feed	761	15.5	776.5
Reclaim Water from Tailings Pond	—	1,149.6	1,149.6	Final Tailings	1,437	1,780.6	3,217.6
Total Entering	2,198	1,846.8	4,044.8	Total Exiting	2,198	1,846.8	4,044.8

Figure 17.3 – Water Balance



17.1.4 Equipment Sizing and Selection

The equipment selection was based on the design criteria and the design factor applied for most pieces of equipment was 15%.

17.1.5 Utilities

a) Concentrator Water Services

The estimated water consumption is based on the nominal concentrator plant mass and water balance.

Fresh water: Lake St. Joseph will be the main water source of fresh water near the concentrator. The nominal fresh water requirement is 581 m^3/h.

Process water: Reclaim water is recycled back from the tailing pond, at a nominal rate of 1,150 m^3/h, using a vertical pump on a barge. The remainder of the process water demand (14,360 m^3/h) comes from the overflow of the concentrate and the tailings thickeners.

Gland water: The gland water system uses fresh water and has a separate water tank.

b) Concentrator Compressed Air

A compressor will supply the concentrator plant with 1,724 cfm of compressed air. An air dryer will be used for instrument air only. The crusher complex has its own compressed air system.

c) Sioux Lookout Compressed Air

Three (3) air compressors will supply the Sioux Lookout facility with 3,680 cfm of compressed air. For the pre-feasibility stage, variable speed drive air compressors will be investigated. An air dryer will be used for instrument air only.

17.1.6 Power Requirements of Concentrator Plant and Sioux Lookout

The power requirement for the 6 Mtpy capacity plant is estimated at 80 MW. This includes only the 75 MW for the concentrator process areas and the 4.8 MW for Sioux Lookout area. More power is required (16.6 MW) for both areas' infrastructure (heat, ventilation and services) and losses through main sub-station equipment and power lines.

17.1.7 Layouts

General arrangement drawings for the concentrator, concentrate dewatering and drying facilities at the Sioux Lookout location are shown in Figure 17.4 and Figure 17.5, respectively. Other drawings of the concentrator and filtration/loadout facilities are shown in Appendix A.

Figure 17.4 – Concentrator General Arrangement, Plan View

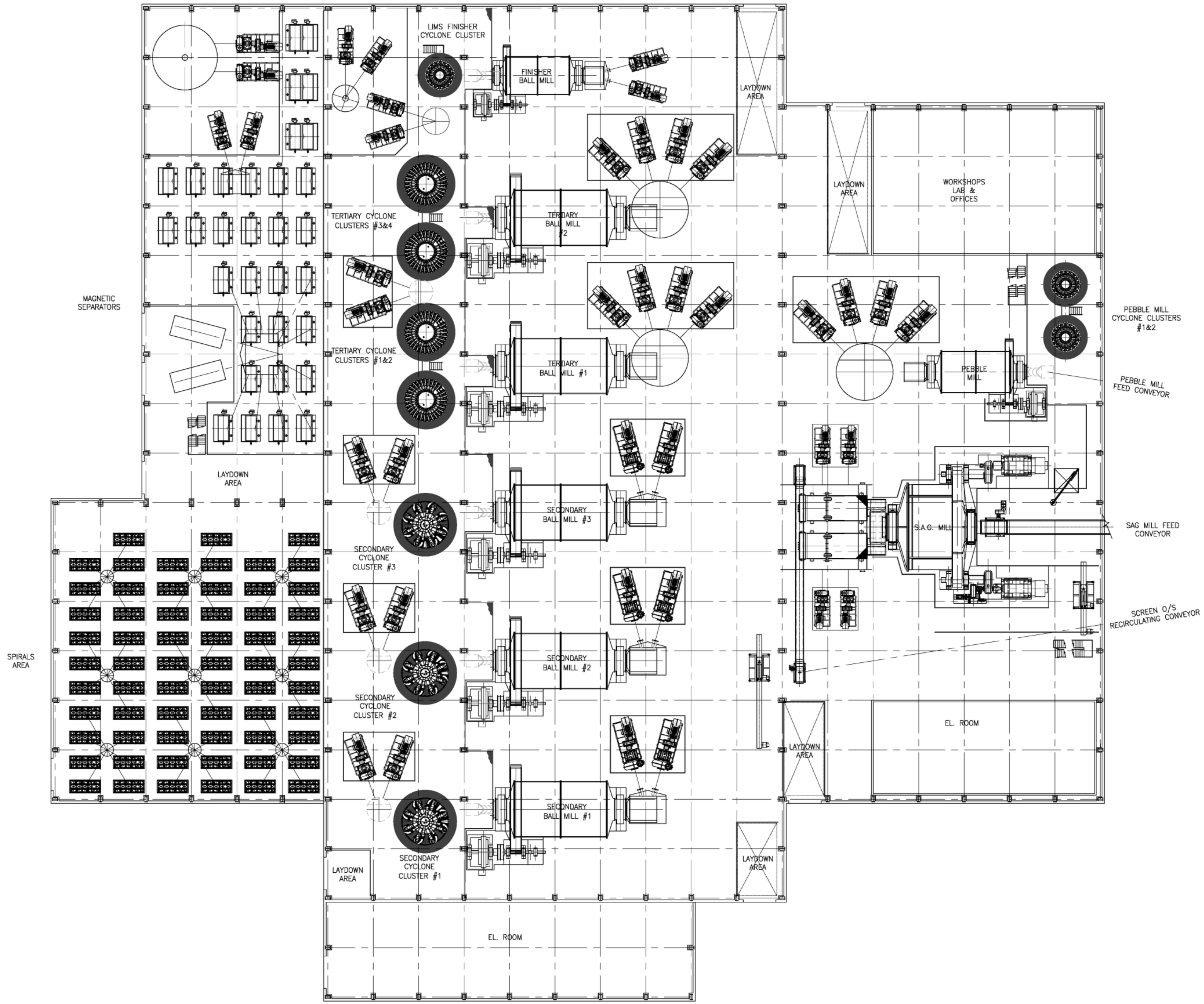
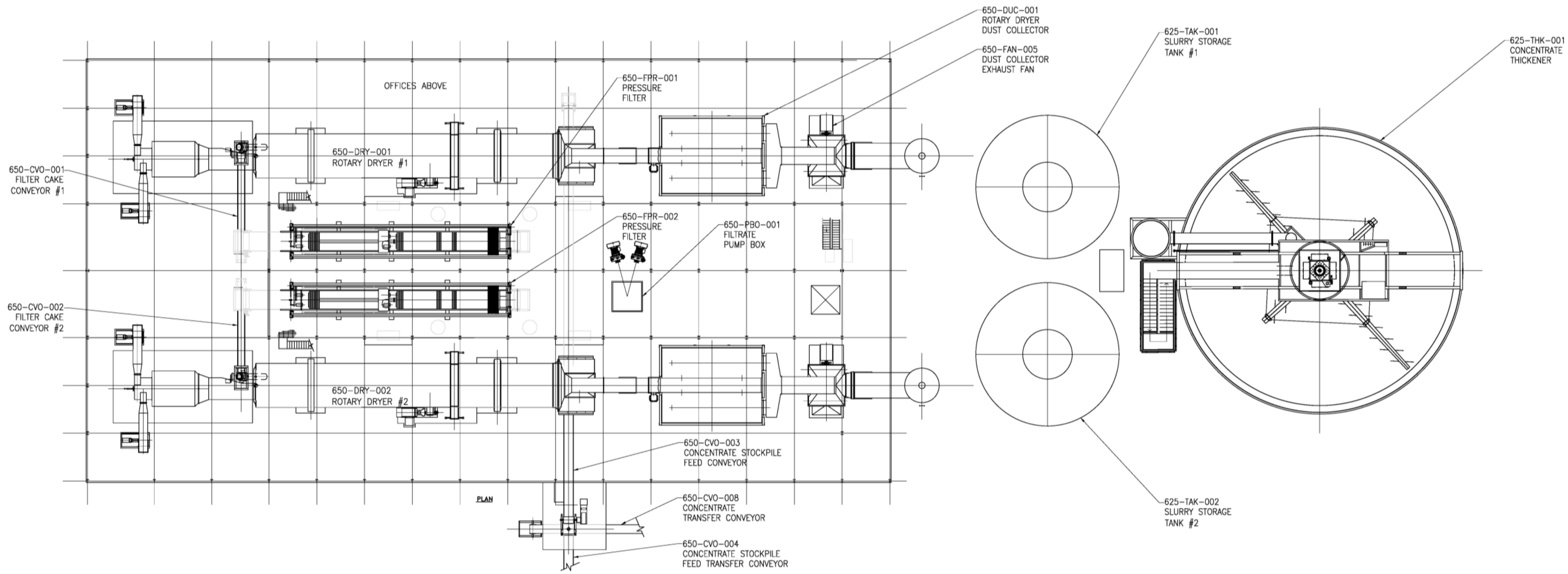


Figure 17.5 – Sioux Lookout Filtering and Drying Facilities General Arrangement Plan View



18.0 PROJECT INFRASTRUCTURE

18.1 Power Mine Site and Concentrator

To supply the power requirements of the plant a new 115 kV overhead power line approximately 40 km long is necessary. The new line will be tapped to the existing 115 kV power line which connects Ear Falls to Pickle Lake and is passing just North of Lake St. Joseph.

The alternative of connecting to the new 230 kV power line of the Wataynikaneyap Project planned for 2015 could be examined at the next phase.

The total power demand is estimated at 91 MW with 75 MW for the process. The remaining power is necessary for: Mechanical Shop, Truck Maintenance, Plant Warehouse, Administration, Camp, Storage Area, Fuel Storage, Electric Rooms, Communication Tower as well as losses in transformers and feeders.

The mine site does not require electrical power because all the mining equipment (shovels, drills, pumps) is diesel powered.

The power demand requirements, by areas, are presented below:

Table 18.1 – Power Demand Requirements – Mine Site and Concentrator

Description	Power Demand Requirements (kW)
Area 100 - Primary Crushing	1,501
Area 150 - Coarse Ore Storage & Reclaim	540
Area 200 - Grinding	39,428
Area 300 - Spiral Separation	0
Area 400 - Magnetic Separation	20,957
Area 500 - Desliming	5,817
Area 600 - Concentrate Pumping	3,867
Area 700 - Water Management	2,402
Area 900 - Air Services & Reagents at Concentrator	466
Sub-Total Process	**74,979**
Process Plant – Heating, Ventilation, Lighting	12,000
Other (Mechanical Shop, Truck Maintenance, Warehouse, Administration Building, Camp, Losses)	4,400
Total General Process and Services	**91,379**

The electrical installation for the mine site and concentrator (process and services) is presented in single line diagrams A1-2013-023-7001-E and A1-2013-023-7002-E, Figure 18.1 and Figure 18.2.

Figure 18.1 – Single Line Diagram – Main Sub-Station

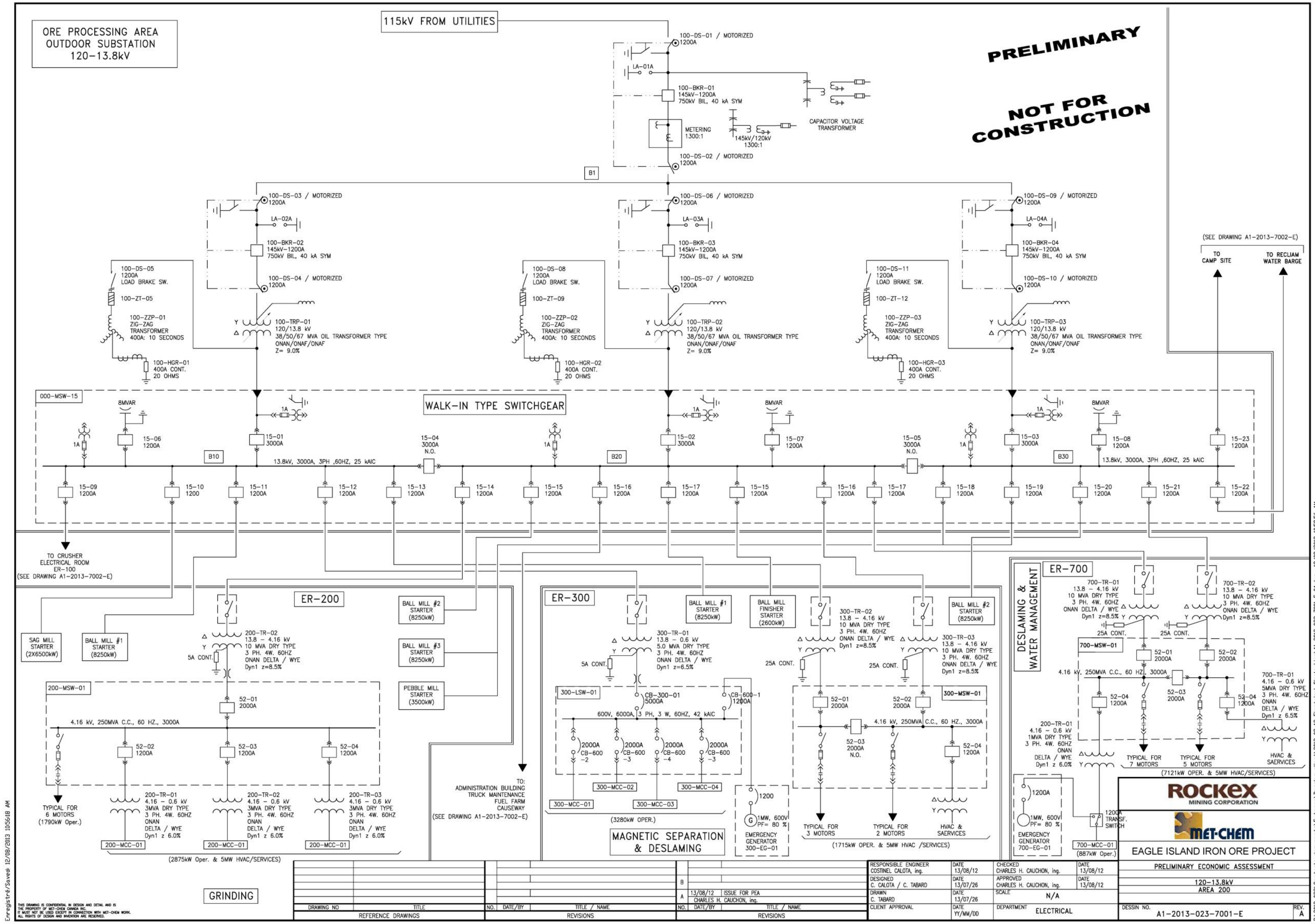
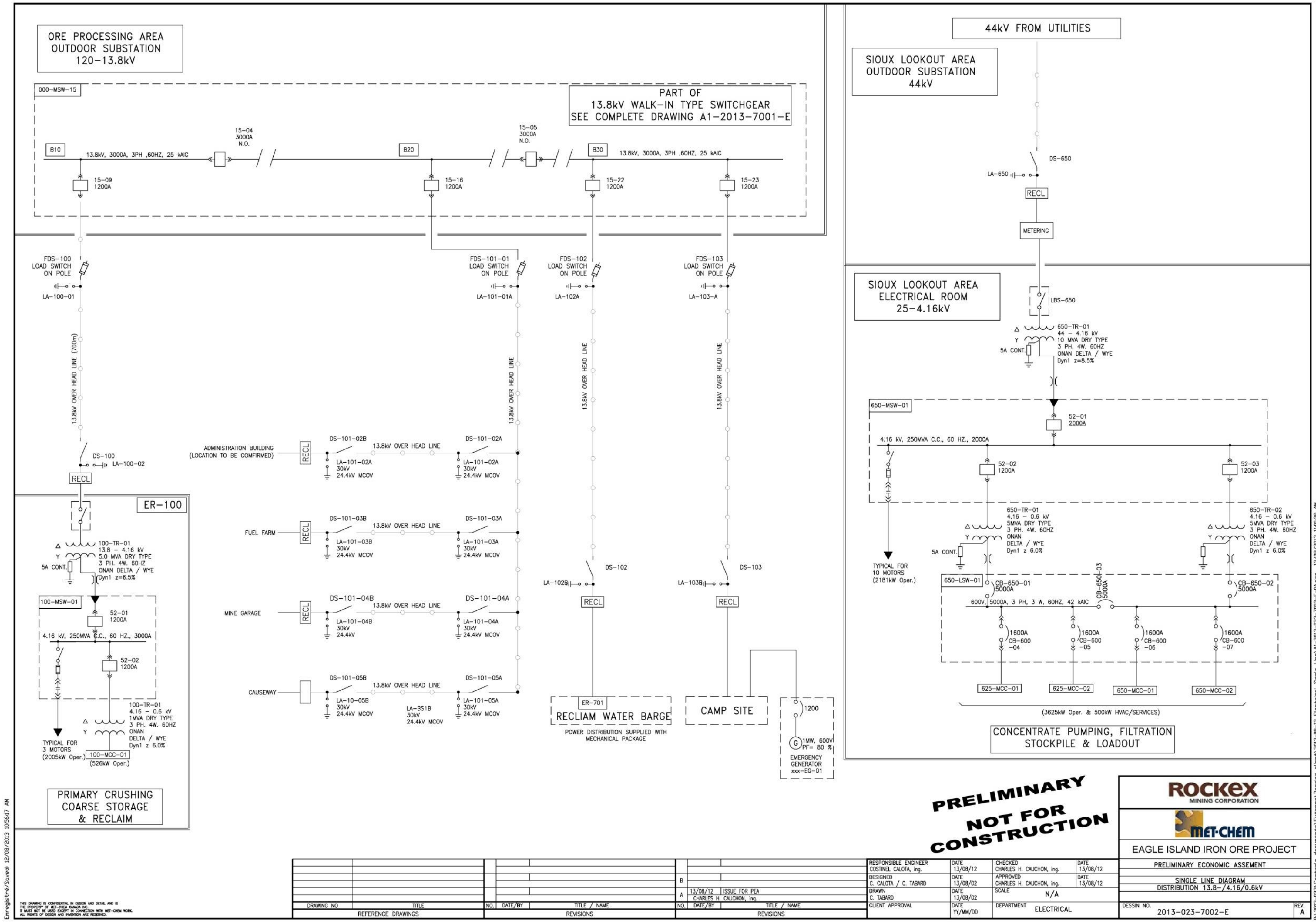


Figure 18.2 – Single Line Diagram – MV Distribution



The plant will be supplied by a 115 kV/13.8 kV main sub-station installed in the neighbourhood of the concentrator. The three (3) step-down transformers (38/50/66 MVA each) are sized to allow operating the entire site with only two (2) of them (if there is a major failure of one transformer). The electrical equipment will be installed in five (5) electrical rooms: the ER-100 for the areas 100 and 150; the ER-200 for the areas 200 and 500; the ER-300 for the areas 300, 400, 500, 700 and 900; the ER-700 for the areas 500, 600 and 700 and the ER-701 for the Reclaim Pumps (on barge).

The site distribution network, with 13.8 kV pole lines, supplies to the following consumers: one (1) line for the crusher, one (1) line for the plant site and camp, one (1) line for the reclaim pumps and one (1) line for the causeway, mine garage area and fuel farm.

The proposed distribution voltage levels for equipment and the type of motors are defined as indicated in table below:

Table 18.2 – Distribution Voltage Levels

Supply Voltage	Equipment
(MV) 13.8 kV, 3 ph, resistance grounded	13.2 kV Wound Rotor Induction Motors for Mills
(MV) 4.16 kV, 3 ph, resistance grounded	4 kV Squirrel Cage Induction Motors ≥ 300 hp
(LV) 600 V, 3 ph, resistance grounded	575 V SCIM < 300 hp; fixed speed; starter FVNR
(LV) 600 V, 3 ph, resistance grounded	575 V SCIM ≤800 hp supplied by LV-VFD.
(LV) 600Y/347 V, 3 ph, solidly grounded	Plant lighting and small loads
(LV) 208Y/120 V, 3 ph, solidly grounded	Plant lighting and small loads

All the motors are SCIM type except the motors for the mills which are wound rotor induction motors started with liquid rheostat. Where the process requests variable speed, the motors are inverted duty type and are supplied by variable frequency drives ("**VFD**").

An emergency power system will be provided as a standby source of power to feed essential services (emergency and exit lighting, fire pumps, etc.) as well as critical process loads in the event of power loss from the power grid. The standby power source consists of three (3) diesel generators (1.0 MW, 600 V, PF = 0.8). The two (2) diesel generators for the process are located in the neighbourhood of ER-300 and ER-700 and the third is near the camp.

18.2 Power Sioux Lookout, Filtering, Drying and Shipping

To supply the power requirements of the Sioux Lookout, a new 44 kV overhead power line approximately five (5) km long is necessary. The new line will be tapped to the existing power line which supplies the town of Sioux Lookout.

The total power demand is estimated at 5.4 MW; 4.8 MW are requested for the process and 0.6 MW are requested for ventilation, lighting and services.

The power demand requirements, by areas, are presented in Table 18.3.

Table 18.3 – Power Demand Requirements – Sioux Lookout

Description	Power Demand Requirements (kW)
Area 625 - Concentrate Reception	1,149
Area 650 - Concentrate Filtration, Drying & Loadout	3,693
Sub-Total Process	**4,842**
Ventilation, Lighting, Services, Losses	560
Total General Process and Services	**5,402**

The electrical installation for Sioux Lookout (process and services) is presented in single line diagram A1-2013-023-7002-E, Figure 18.2.

The plant will be supplied by a 44 kV/4.16 kV substation installed in the neighbourhood of the filtration and drying building. The electrical equipment will be installed in the ER-650. Pole lines 4.16 kV will provide a site distribution network to supply the lighting and the services for the stockpile and loading areas.

An emergency power system will be provided as a standby source of power to feed essential services as well as critical process loads in the event of power loss. The standby power source consists of two (2) diesel generators (1.0 MW, 600V, PF =0.8) located near the ER-650.

18.3 Concentrate Pipeline

The 135 km long buried pipeline starts at the concentrator building and ends at the slurry tanks near the Sioux Lookout filtration and drying building. The concentrate pipeline will be about 400 mm in diameter for the 6 Mtpy capacity plant. The exact diameter and routing of the pipeline will be defined at the next level of study. Filtrate water from the dewatering process will be used as process water and the excess will be sent to a settling pond, clarified and returned to the natural water system.

18.4 Site Access, Main Road, Site Roads

The closest main highway to the Lake St. Joseph mine site is at Sioux Lookout. A good paved road covers the first 40 km towards the Lake St. Joseph mine site. It is followed by 20 km of unpaved secondary forestry road which offers a good road bed but will need some upgrading. Then about 15 km will have to be relocated and/or upgraded on account of the tailing pond or because of muskeg and poor conditions.

A series of dykes will be constructed to dewater the mineral resources that lie beneath the lake. A causeway will connect the mainland to Eagle Island in Lake St. Joseph and site roads will provide access to the following areas:

- Communication towers and helicopter pad;
- Explosive storage;
- Fuel tank farm;

- Tailing pond;
- Borrow pit;
- Fresh water source.

18.5 Maintenance and Storage Facilities

The mine maintenance facilities building will include the following:

- Three (3) major mining equipment maintenance bays;
- Three (3) light maintenance bays;
- One (1) vehicle wash bay;
- A small warehouse area;
- Some offices, lunch room, restrooms;
- All services, equipment, tools and supplies for the facilities.

A separate area within the concentrator building provides for the shops (mechanical, electrical and instrumentation/control), warehouse, lunch room, restroom and showers, etc.

Allowances are also provided for a warehouse and cold warehouse at the Lake St. Joseph site, as well is some storage facilities at the Sioux Lookout site.

Sioux Lookout filtering, drying storage and shipping facilities will have their own smaller shop and warehouse facilities.

18.6 Administration Offices, Change House

No guard house is required at the mine site. Some administration offices and conference rooms will be provided on the second floor above the kitchen and lunch rooms of the permanent camp at the concentrator site. The main office will be located at the Sioux Lookout site.

A change house is provided at Lake St. Joseph as well as at the Sioux Lookout site. All services, equipment, furniture and supplies are included.

18.7 Camp Accommodations

The permanent residential camp will be located close to the concentrator building and will have capacity for 220 people. It will comprise single-occupancy bedrooms with individual shower and toilet facilities, lounges, recreational areas, a fitness area, kitchen and lunch rooms.

No camp is anticipated for the Sioux Lookout facilities since most of the employees are expected to be from the area. A lunch room and a kitchen will be provided.

During construction of the 6 Mtpy plant, a 500-person construction camp will be rented and installed near the site of the permanent camp. It will be demobilized at the end of the construction period.

18.8 Helicopter Pad

No airstrip is included for Lake St. Joseph but a helicopter pad and hangar will be built in case emergency transport is needed.

18.9 Service Vehicles and Equipment

While not detailed at this stage, some provisions for service vehicles and equipment are included, typically:

- Light vehicles: i.e. buses, minivans, pick-up truck;
- Earthwork: i.e. loaders, graders, dump truck;
- Material handling: i.e. boom-truck, cranes, forklift;
- Service vehicles: i.e. water truck, snow plow;
- Service equipment: i.e. HDPE fusion machine, lighting tower;
- Emergency: i.e. fire truck, rescue truck, ambulance.

A truck scale is also included.

18.10 Emergency Vehicle Building and First Aid

No emergency vehicle building is provided.

The first aid facilities will be located in the office building and include sanitary services, an office for a nurse as well as waiting, examination and recovery rooms.

18.11 Site Communications

There will be one communication tower installed on site, at the concentrator area.

The following communication systems are included:

- Telephone network;
- Computer network;
- Automation network (for instrumentation/control);
- Surface radio system;
- Cable television network (camps only);
- Internet access.

The communications equipment will be installed during the first phase of mine and camp construction and will serve for both the construction and production phases.

18.12 Assay Laboratory

The fully-equipped assay laboratory will be located in the concentrator building.

18.13 Water Management and Services

Fresh water will be taken from Lake St. Joseph near the concentrator building. A floating barge will house the pumps and electrical equipment and will be fitted with a de-icing pump system. Water will be distributed to the different buildings and camp and will be treated for potable use.

All sanitary waste water will be collected and directed to sanitary treatment plants. These will be located at the permanent camp, one at the temporary construction camp and one at Sioux Lookout. Smaller units will also be included at the mine service garage and the explosive plant.

General fire protection is included for both sites: fire loop and hydrants, detection and alarm system.

18.14 Waste Management

Waste will be separated into four (4) types, kitchen waste, metals, garbage and wood and other dry construction material. Metals will be sent out for recycling. Kitchen waste, garbage, wood and construction materials will be disposed of in a nearby trench disposal facility.

18.15 Fuel Storage

The principal fuel storage facility will be located at the mine site area. All fuel tanks will be installed within a bermed area, lined with geo-membrane.

The fuels stored at site will be for two (2) weeks requirements:

- Diesel for mining equipment, mobile equipment and service vehicles;
- Gasoline for small tools and equipment, all-terrain vehicles and snowmobiles.

18.16 Batch Plants

No concrete mixing plant or aggregate preparation plant is included.

19.0 MARKET STUDIES AND CONTRACTS

Rockex's product is a 66.3 % Fe, 5.23 % SiO_2 pellet feed. The product choice was guided by both available test work and some high level trade-off studies. The market that offers the most advantages is the geographically closer steel producers in the North American market (especially Northern, Central United States of America) and alternatively, China.

Although the current Study considers the final product to be pellet feed, it is worth mentioning that there exists the potential for a change to the final product. Alternative final products include pellets and/or Hot Briquetted Iron ("**HBI**"). Rockex can either produce a single product (such as pellet feed) or diversified products (such as pellet feed, pellets and HBI).

The Study considers the point of sale to be Sioux Lookout. This location was chosen for the Study but the opportunity to move the final product production facilities to the Port of Thunder Bay will likely be explored in a subsequent level of study.

19.1 Market Study Background

The analysis and recommendations herein are the culmination of various sources of market data, market analysis and expert opinions within the iron ore industry. These sources have been used along with Met-Chem expertise to provide the following.

As there are alternative final products for Rockex's Eagle Island Project, it is worth briefly reviewing their characteristics and properties.

19.1.1 Description of Products in the Iron Market

a) Iron Ore Concentrate

Iron ore concentrate is the concentrator plant product. Depending on the final size distribution of the product particles, the material classifies as either: pellet feed (< 0.1 mm), concentrate (>0.1 to 1 mm<), sinter fines (>1 to 6 mm<), or lumps (> 6 mm). Pellet feed needs to be pelletized in a pellet plant. Concentrate can either be pelletized (which may require further grinding) or mixed in with sinter fines to make a sintered product. Sinter fines will be agglomerated and sintered before being fed to a blast furnace. Lumps can be fed directly to a blast furnace. Table 19.1 shows some typical ranges of specifications of both pellet feed and concentrate from producers of the products.

Table 19.1 – Typical Pellet Feed/Concentrate Specifications

Parameter	Unit	Pellet Feed[1]	Concentrate[2]
Fe	%	65.0 – 69.0	64.2 – 70.7
SiO_2	%	1.1 – 3.5	0.6 – 9.0
Al_2O_3	%	0.4 – 1.7	0.17 – 0.32
TiO_2	%	0.03 – 0.15	0.03 – 0.42
CaO	%	0.01 – 0.11	0.01 – 0.3
MgO	%	0.03 – 0.08	0.03 – 0.4
$Na_2O + K_2O$	%	0.01 – 0.02	0.005 – 0.06
Mn	%	0.02 – 0.65	0.04 – 0.15
P	%	0.02 – 0.055	0.009 – 0.05
S	%	0.003 – 0.45	0.003 – 0.07
Moisture	%	5.0 – 12.5	1.0 – 8.5
Size (% passing 500 µm)	%	86 – 96	66 – 98
Size (% passing 180 µm)	%	50 – 85	79 – 90
Size (% passing 63 µm)	%	30 – 87	4 – 90

[1] Ranges obtained from a survey of South American Pellet Feed Producers
[2] Ranges obtained from a survey of Leading Concentrate Producers

b) Blast Furnace Pellets

The other alternative is to produce an iron ore product intended for the blast furnace. Producing an iron pellet through pelletizing is the standard process used to agglomerate very fine concentrates (i.e. pellet feed) into a charge material suitable for blast furnaces.

Iron ore concentrate is received and is filtered. Additives which help with the agglomeration (balling) process are added and intensively mixed. The material is balled and finally fired in an induration furnace. The final product is a “round” pellet. The process requires a source of heating the furnace. Having a nearby source of economical fuel (e.g. natural gas) is considered an advantage for a pellet plant.

Advantages of pellets as compared to other iron products are:

- They are easily transported, and shipped, which is not necessarily true for concentrates.
- There is a price premium associated with pellets.
- They are a primary feed for blast furnaces.
- The global market for pellets is well developed.

Table 19.2 gives a typical acid pellet specification range derived from leading pellet producers.

Table 19.2 – Typical Acid Pellet Specifications

Parameter	Unit	Acid Pellet[1]
Fe	%	65.1 – 67.3
SiO_2	%	2.6 – 5.2
Al_2O_3	%	0.23 – 0.5
TiO_2	%	0.04 – 0.25
CaO	%	0.4 – 1.0
MgO	%	0.25 – 0.84
$Na_2O + K_2O$	%	0.03 – 0.24
Mn	%	0.035 – 0.15
P	%	0.009 – 0.025
S	%	0.001 – 0.008
Moisture	%	1.2 – 2.6
Size (% passing 16 mm)	%	97.5 – 99
Size (% passing 6.25 mm)	%	1.8 – 1.5

[1] Ranges obtained from a survey of Leading Acid Pellet Producers

c) DRI / HBI Products

Direct Reduced Iron ("**DRI**") is a metallic material produced from iron oxide fines, iron oxide pellets and/or lump ores that have been reduced (oxygen removed) without reaching the melting point of iron. Hot Briquetted Iron is a premium form of DRI that has been compacted at a temperature greater than 650° C at time of compaction.

Table 19.3 gives a typical HBI specification range. It should be noted that for every tonne of HBI that is produced, 1.5 tonnes of DRI pellets are needed. This ratio accounts for the loss in oxygen during the reduction process. The gangue material is not removed during the reduction process; therefore impurities will have a higher concentration in the HBI than in the concentrate.

The process of reduction is carried out by the gas in the furnace. The gases, H_2 and CO, remove the oxygen when the reduction temperature is met. H_2 and CO can be formed by either coal or by natural gas. A plentiful source of either natural gas or coal is required for any HBI plant.

DRI/HBI can be fed as:

- Primary feed for an Electric Arc Furnace ("**EAF**"), especially where scrap availability is low;
- Supplemental feed to an EAF: to dilute impurities due to the scrap and to allow product specifications to be met;

- Supplemental feed to a Basic Oxygen Furnace ("**BOF**"), to add Fe units, reduce slag volume (compared to flux material), to control temperature and to be used as a cold charge;
- Supplemental charge for a blast furnace: to increase Fe units, to increase productivity, reduce the coke rate and to lower the CO_2 emissions.

Table 19.3 – Typical DRI/HBI Specification Ranges

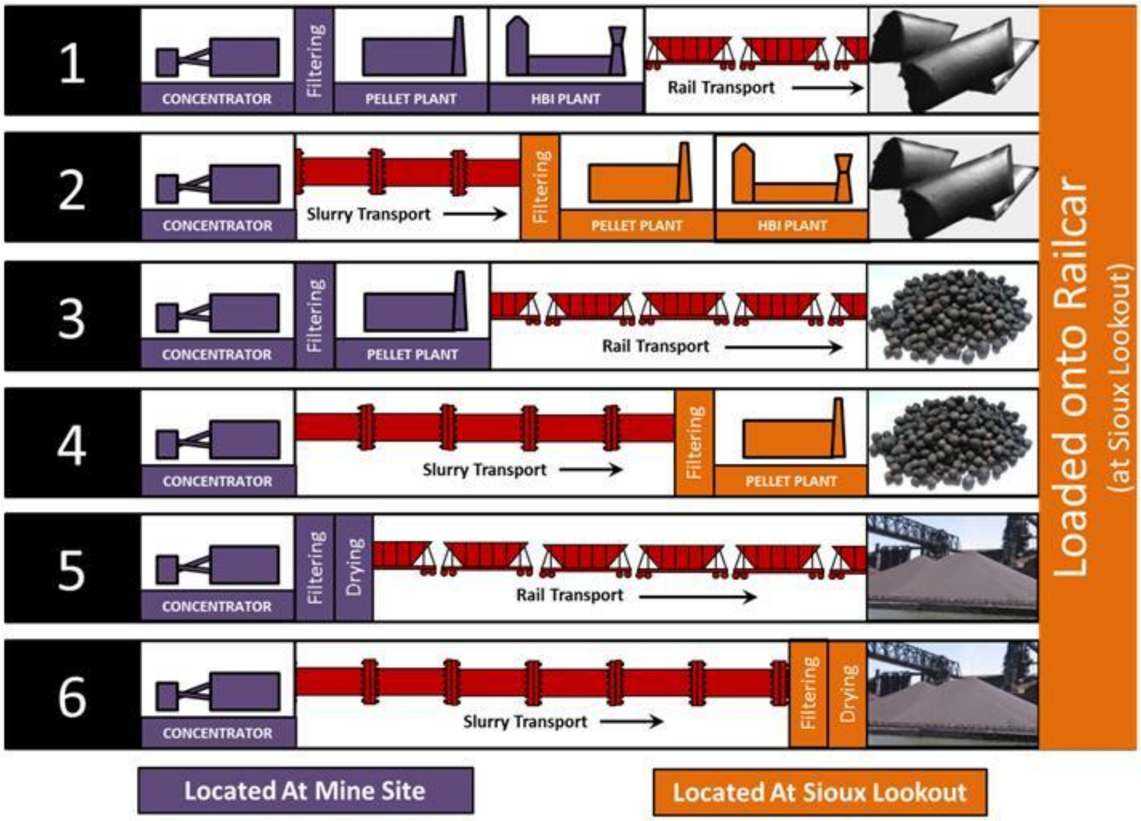
Parameter	Unit	DRI[2]	HBI[2]
Metallization	%	94	94
Fe (Total)	%	86.1 – 93.5	88.3 – 94.0
Fe (Metallic)	%	81.0 – 87.9	83.0 – 88.4
C	%	1.0 – 4.0	0.5 – 1.6
S	%	0.001 – 0.03	0.001 – 0.03
P_2O_5	%	0.005 – 0.09	0.005 – 0.09
Gangue[1]	%	3.9 – 8.6	3.9 – 8.6
Mn, Cu, Ni, Cr, Mo, Sn, Pb, Zn	%	Traces	Traces
Size	mm	4.0 to 20.0	30 x 50 x 110
Apparent Density	t/m^3	3.4 – 3.6	5.0 – 5.5
Bulk Density	t/m^3	1.6 – 1.9	2.5 – 3.3

1 Minus S, P_2O_5 & trace elements
2 From International Iron Metallics Association – Ore Based Metallics: Overview (2013-01-28/29)

19.1.2 Background of the Rockex Project

At the commencement of the Project, a trade-off study was performed based on both the bench scale metallurgical test work and information available at the time. The trade-off study evaluated the six (6) scenarios as depicted in Figure 19.1. The three (3) products considered were pellet feed (6 Mtpy), pellets (6 Mtpy) and HBI (4 Mtpy). The scenarios also considered location and transport variability such as locating the pellet plant and HBI plant either at site or at a geographically nearer point to the Trans-Canada natural gas pipeline (Sioux Lookout, Ontario) by using either rail or pipeline. The different scenarios were evaluated based on the Internal Rate of Return ("**IRR**"), NPV and the capital investment required.

Figure 19.1 – Trade-off Study Scenarios Considered



The scenario chosen to pursue this Study was to produce 6 Mtpy of pellet feed transported by slurry pipeline to Sioux Lookout. Material will be dewatered, dried and loaded into railcars at Sioux Lookout (i.e. Scenario 6 as shown in Figure 19.1).

19.2 Potential Markets

The Rockex Project is located close to the center of North America. Therefore there are several regional markets which may be considered as potential consumers for Rockex concentrate. These are:

- North America, particularly the steel producers around the Great Lakes;
- Asia/China;
- Europe;
- Middle East and North Africa ("**MENA"**).

Each of these regional markets have their particularities in terms of iron ore supply/demand, and type of products which are more or less sought after.

From a strictly logistical point-of-view, the North American market is the most advantageous market for Rockex iron ore product. This conclusion applies for all product types which are possible for the Rockex Project.

19.3 Market Survey

19.3.1 General Iron Ore Market

The last decade of the iron ore market has been a case of demand exceeding supply. China’s exceptional growth during their drive toward industrialization has pushed iron ore prices to unprecedented highs. Table 19.4 shows the growth of primary iron products since 1991.

Table 19.4 – Primary Iron Production by Product (Mtpy)

Product Type	1991	2001	2003	2005	2007	2009	2011	2012
Pig Iron Production	500	580	650	780	940	900	1083	1117
Direct Reduced Iron	19	40	49	55	63	64	73	74
Global Pellet Production	225	238	285	310	325	215	421	424
China Pellet Production	5	27	35	58	94	110	132	135

The current situation is that China’s growth has slowed to a much more reasonable growth rate and that iron ore suppliers are due to be able to meet demand. As large amounts of supply are due to come online and seaborne iron ore capacity is due to increase, iron ore prices are expected to moderate.

19.3.2 Pellet Feed Market

The merchant pellet feed market is relatively small compared with other iron ore markets. Most of the pelletizing plants in the world outside of China rely on feed from captive mines located close-by, and are not included in those participating in the pellet feed market. In contrast, China does rely on merchant pellet feed for their pelletizing facilities. Table 19.5 shows how, in 2010, China represents 72% of the importation of pellet feed. By 2017, it is estimated they will represent 76.7 % of the importers while the market is expected to grow by 80% from 2010 to 2017.

Table 19.5 – Leading Exporters and Importers of Pellet Feed from 2006 to Forecasted 2017 (Mtpy)[1]

Country	Unit	2006	2010	2017
Exports				
Norway	Mt	0.2	0.3	3
Brazil	Mt	34.7	61.1	102.6
Chile	Mt	2.5	3	4
Peru	Mt	1.5	1.8	1.7
Venezuela	Mt	2.5	0.9	2.5
Total	**Mt**	**41.4**	**67.1**	**113.8**
Imports				
Netherlands	Mt	3.5	3.6	4
Mexico	Mt	3.5	0.1	0
USA	Mt	0.3	0.3	0.3
China	Mt	24.9	51.4	98.1
Japan	Mt	4.3	3.8	4.5
Malaysia	Mt	0	3	6
Middle East	Mt	4.4	8.8	15
Other	Mt	0.5	–	–
Total	**Mt**	**41.4**	**71**	**127.9**

[1] Values adapted from CRU pellet forecasts

The most promising market for Rockex is China as the largest participant in the pellet feed market. The potential challenges to Rockex with this option include:

- Locally produced pellet feed;
- Pellet feed from overseas in which the Chinese pelletizing plants already have equity interests;
- Premium grade pellet feeds.

Therefore, in order to eliminate the market risks associated with the pellet feed option, acquiring an equity partner from China would be advisable.

19.3.3 Pellet Market

The pellet market is estimated by World Steel Dynamics (“**WSD**”) to grow from 307 Mtpy in 2013 to 401 Mtpy by 2025. The major driver in the growth is China followed the Commonwealth of Independent States (“**CIS**”) and the United States of America (“**USA**”) (Table 19.6).

Due to its proximity to the Eagle Island deposit and its forecasted growth, the USA blast furnace pellet market is an attractive opportunity for Rockex. China, as the leading growing pellet market, is another market that Rockex needs to continue to develop. The remaining markets, due to either logistic complexities or lack of forecasted market growth, should be set aside as potential targets. This being said, a change in circumstances (e.g. unexpected market growth, strategic agreements) would warrant a re-evaluation of these markets.

Table 19.6 – Blast Furnace Pellet Demand from 2008 to Forecasted 2025 (Mtpy)[1]

Country	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025
Europe Region	51.1	34.8	46.5	46.8	44.8	44.0	45.3	46.1	50.8	56.2
USA and Canada	55.9	32.0	45.5	49.6	52.2	52.0	52.6	53.2	56.6	60.3
United States	42.9	24.2	34.2	38.5	40.9	39.9	40.5	41.1	44.3	47.6
Canada	12.9	7.8	11.3	11.1	11.3	12.2	12.1	12.1	12.3	12.7
Latin America Region	9.8	8.2	9.3	10.1	9.4	9.7	10.1	10.4	12.1	14.3
CIS Region	48.5	42.6	46.1	47.4	48.4	54.0	56.8	59.7	72.6	86.3
MENA Region	0.9	0.9	0.9	0.8	0.7	1.1	1.2	1.2	1.4	1.6
Africa Region	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia Region ex China	17.5	14.4	17.8	19.6	19.4	20.1	20.7	21.2	23.6	26.3
China	83.5	97.5	103.0	112.6	116.7	124.3	127.6	130.1	141.5	154.5
Oceania Region	2.3	1.7	2.3	2.0	1.4	1.5	1.5	1.6	1.7	1.9
World Total	**269.5**	**232.1**	**271.4**	**288.8**	**293.1**	**307.0**	**315.8**	**323.4**	**360.4**	**401.6**

[1] Forecast values from World Steel Dynamics

19.3.4 DRI/HBI Markets

In the following Table 19.7, the growth of steel production via the EAF is expected to grow at a regular rate. The impact on iron ore consumption will be uneven, as regions rich in scrap will emphasize scrap feed for the EAF while DRI production to feed the EAF will be favored in scrap deficient regions.

Table 19.7 – Estimated Steel Product Production (Mtpy)[1]

Product Type	2013	2014	2015	2020	2025
Pig Iron	1175	1211	1241	1387	1557
EAF Crude Steel	464	481	496	587	687
Blast Furnace Crude Steel	1219	1256	1287	1439	1614

[1] Forecast values from World Steel Dynamics, 2013

Table 19.8 and Table 19.9 look at the DRI/HBI production by region/country and the DRI pellet demand. The USA stated DRI pellet demand grows in step with the growth of their DRI/HBI production. As the closest DRI/HBI market to the Eagle Island Project, the

North American electric arc furnace industry and grey foundry industry is a potential client.

HBI is considered to be a cleaner, higher quality, finished iron product for the steel industry and is an excellent substitute for scrap steel. The HBI process requires access to an abundant and low cost source of natural gas. Considering Rockex's proximity to the TransCanada Natural Gas Pipeline, there is opportunity to leverage its proximity to transportation infrastructure to supply the North American market in the USA immediately south of the Great Lakes and in Canada.

Table 19.8 – DRI/HBI Production by Country/Region (Mtpy)[1]

Country	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025
USA and Canada	1.0	0.3	0.6	0.7	0.6	0.6	2.7	3.2	5.9	8.5
United States	0.3	0.0	0.0	0.0	0.0	0.0	2.0	2.5	5.0	7.5
Canada	0.7	0.3	0.6	0.7	0.6	0.6	0.7	0.7	0.9	1.0
Latin America Region	17.9	12.7	14.3	15.1	15.8	16.3	17.2	18.0	22.2	27.3
Europe and Russia	5.1	5.1	5.2	5.6	5.7	5.8	5.9	7.7	9.2	10.3
MENA Region	18.3	19.4	22.3	28.5	26.8	26.8	27.2	27.7	33.1	38.7
Africa, Asia ex China	25.6	27.0	28.3	26.9	28.7	30.5	32.9	35.2	47.5	61.4
China	0.2	0.0	0.7	0.0	0.5	0.6	2.0	3.5	15.1	20.1
India	21.2	22.0	23.4	22.0	24.2	26.0	28.1	30.1	41.1	53.4
World Total	**68.0**	**64.4**	**71.3**	**76.7**	**78.2**	**80.5**	**87.9**	**95.2**	**132.9**	**166.3**

[1] Forecast values from World Steel Dynamics, 2013

Table 19.9 – DRI Pellet Demand by Country/Region (Mtpy)[1]

Country	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025
USA and Canada	1.3	0.5	0.8	1.0	0.9	0.9	3.8	4.8	7.7	10.7
United States	0.3	0.0	0.0	0.0	0.0	0.0	2.9	3.8	6.5	9.2
Canada	1.0	0.5	0.8	1.0	0.9	0.9	0.9	1.0	1.2	1.4
Latin America Region	20.9	14.6	17.1	18.4	19.5	20.1	21.3	22.3	27.6	34.1
Europe and CIS	6.3	6.3	6.4	6.9	7.1	7.2	7.9	9.3	9.4	10.4
MENA Region	19.6	20.7	23.9	26.8	27.7	27.6	28.0	28.5	34.1	40.0
Africa Region	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Asia Oceania Region	14.9	15.4	17.2	15.3	16.8	18.0	21.0	24.0	44.6	58.1
China	0.2	0.0	0.8	0.0	0.6	0.7	2.4	4.2	18.1	24.1
India	10.9	11.3	12.0	11.3	12.4	13.4	14.4	15.5	21.2	27.5
World Total	**63.2**	**57.7**	**65.4**	**68.4**	**72.1**	**73.8**	**82.1**	**89.0**	**123.5**	**153.4**

[1] Forecast values from World Steel Dynamics, 2013

Due to the growing market, future studies need to continue to be open to the possibility of producing HBI as a product.

19.4 Product Pricing

Long range price forecasts, by various banks, for iron ore have a range of US$80 to US$150/tonne at 62% Fe fines CFR China (see Table 19.10). For the purposes of this Study, the value of US$105/tonne of 66.3% Fe pellet feed FOB Sioux Lookout was used (note that the price is subject to change once a firm buyer, market or equity partner is identified).

Table 19.10 – Price Forecasts of Iron Ore 62% Fe Fines

Source[1]	Forecast Indicator	Revision Date	2013	2014	2015	Long Term
Goldman Sachs	Iron ore 62% Fe, CFR China	Jan. 13	144	126	90	80
Standard Bank	Iron ore – Indian fines spot to China	Jan. 13	135	125	115	n/a
Deutsche Bank	China imported fines (62% CFR)	Jan. 13	125	115	110	80
World Bank	Iron ore fines (62%), spot , CFR China	Jan. 13	130	132	135	150
Citigroup Inc.	Iron ore fines, Australia	Jan. 13	120	122	122	n/a
Macquarie Bank	Spot 62% Fe iron ore China	Jan. 13	130	125	115	80
Credit Suisse	Iron ore fines – 62% (China CFR), dry	Jan. 13	120	100	90	90
CBA	Iron ore spot (62% CFR China)	Jan. 13	117	119	115	86
Merill Lynch	Iron ore (Fe 63.5%, fines)	Jan. 13	124	111	n/a	n/a
ANZ	Iron ore spot (CIF China, fines)	Jan. 13	122	129	125	n/a
Max. Forecast	Iron ore fines (62% Fe, CFR China)		144	132	135	150
Min. Forecast	Iron ore fines (62% Fe, CFR China)		117	111	90	80

[1] Source: http//metalexpertresearch.com/research/en/global_iron_price_forecast_(january_2013)_1.htm

19.5 Potential Risks with Mitigation

As summarized in Table 19.11, the following risks were identified: transportation costs, market for pellet feed and global iron ore prices.

Transportation costs for markets outside of North America, being higher than those required for supplying the local Great Lake steel producers, is a project sensitivity. Besides focusing on the local market, this risk can be mitigated by obtaining a strategic partner who will absorb part of the logistical cost in order to capture the resource for strategic reasons. Additionally, moving the pellet feed dewatering facility to the Thunder Bay port could simplify the product logistics by removing the transport by rail car step from Sioux Lookout to the Thunder Bay. Alternatively, depending on the location of the client, there may be mutually beneficial agreements that can be made with the rail companies (such as taking advantage of empty train cars returning to their original destination).

Table 19.11 – Potential Risks, their Effects and Mitigation

Risk	Effect	Mitigation
Increase in Transportation Costs	Higher transportation costs will reduce the FOB selling price of Rockex's product from Sioux Lookout	- Arrange agreements with the rail companies to secure lower transportation costs. - Obtain strategic partner who will absorb the transportation costs in exchange for capturing the resource. - Focus on the near-by great lakes steel producers, where proximity reduces/eliminates transportation risk. - Change location of dewatering facility to Thunder Bay port to simplify logistic chain.
Insufficient Local Pellet Feed Merchant Market	Difficulty in selling pellet feed to the local North American pellet feed merchant market.	- Produce pellets/HBI as a final product or produce a diversified product (i.e. HBI, pellets and pellet feed) to take advantage of multiple markets.
Iron Ore Market Price Decreases	Lower selling price for Rockex's product from Sioux Lookout	- Reduce the operating cost. - Preferential use of high grade iron ores during the low price time periods.

In the case that the local pellet feed market may not be sufficiently large for the entire production. The mitigation factor for this risk has already been identified as an opportunity, i.e. Rockex should diversify their products (i.e. Pellets and DRI/HBI). This strategy will allow Rockex to adapt to changes in the local marketplace.

As in all projects, a drop in global iron ore price is a project sensitivity. The mitigation for this risk is to reduce the operating price of the project and also to identify which parts of the deposit can be targeted in order to high grade the processing plant in order to reduce feed tonnage (reducing mining and process operating costs).

19.6 Conclusions and Recommendations

Global iron ore market conditions are expected to weaken with respect to the conditions seen in the last decade. This will shift the emphasis of products to higher quality as opposed to quantity. Rockex's next stage of testing will need continue the work it commenced in producing high quality pellet feed. This test work can potentially improve the yields associated with producing high quality pellets and also it may strengthen the viability of producing DRI/HBI as a final product.

When looking at size of the market, the Asian/Chinese market is the lower risk option compared to the local North American market. When logistics are considered, the local North American market offers some economic advantages. Therefore, it is recommended that the Rockex marketing strategy be developed to target either/both these two (2) regions.

Producing quality blast feed pellets (SiO_2 < 4%) is an opportunity to increase the marketability of the Rockex product. Quality pellets would ease the entry into Rockex's local market, which would allow them to use their location as an advantage. Additionally, the fine size of the concentrate requires no additional grinding prior to pelletization. This option was deemed a potentially viable avenue during the early stages of the PEA. This opportunity may warrant an in-depth look by Rockex in subsequent studies of their Eagle Island deposit.

The opportunity wherein Rockex produces a HBI product is balanced between many yet to be determined criteria. Test work, other than a few explorative attempts, has not focused on making a concentrate for HBI. The potential for growth has been identified by the WSD in their 2011 World Crude Steel Forecast that, between 2011 and 2020, the requirements for scrap for steelmaking may grow faster than the scrap reservoir. Therefore, it is recommended that the HBI option should be kept open and available to Rockex (i.e. the option to produce HBI should be re-examined in the next stage of the Project) as the opportunity may quickly mature.

There may be an opportunity in producing multiple products. It will allow Rockex to take advantages of various markets (i.e. pellet feed, pellets and HBI).

There may be an opportunity to be realised through changing the final location of the concentrate (pellet feed) dewatering facility (currently located at Sioux Lookout) to Thunder Bay. The main advantage would be the option of loading the final product onto either a ship or rail car (as opposed to solely a rail car). This opportunity was considered in a trade-off study as being potentially viable and should be examined in greater depth in future studies.

20.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Studies

To this date, no fresh environmental baseline studies have been conducted on the Project. WGM have reported, in their 2011 Technical Report on the Property, that a comprehensive Environmental Impact Assessment was prepared in the early 1970s. A draft report titled: *"Environmental Assessment of the Lake St. Joseph Project, Steep Rock Iron Mines Limited, Atikokan, Ontario"* was published by Bechtel in 1975. According to WGM's Technical Report, this report, AMICUS No. 158005955, is in the library collections of the University of Waterloo and at Lakehead University.

The scope of baseline information to produce environmental assessments for regulators will need to include physical, biological and social aspects of the environment for the three (3) main components of the Project (the Eagle Island mining complex, the concentrate pipeline and the Sioux Lookout pellet feed filtering and shipping facility):

- Geomorphology and detailed map of topographical features (lake, streams, wetland, etc.);
- Local meteorological information (temperature, precipitation and wind);
- Ambient air quality;
- Soils characteristics and historical land use;
- Surface water and groundwater existing quality;
- Assessment of flora, fauna as well as avifauna;
- Archeological potential;
- Local social and demographical information;
- Stakeholders.

Preliminary indications show that mineralization or waste rock should not be acid generating: most of the core samples have been tested with a % S less than 0.3%. Consequently, design at PEA level has considered that mineralization, tailings and waste rock were not acid generating.

Nonetheless, in order to rule out problematic acid rock drainage or metal leaching, geochemical testing will need to be conducted in the subsequent phases of the Project, on mine rock and tailings samples, for an assessment of the metal leaching and acid rock drainage potential of mine wastes generated by the Project.

20.2 Permitting

The Ministry of Northern Development and Mines ("**MNDM**") is responsible for coordinating and overseeing the permitting process of mining projects in the province of Ontario.

Federal laws and regulations that could have significant direct impact on the proposed Project include the Canadian Environmental Protection Act ("**CEPA**"), the Canadian Environmental Assessment Act ("**CEAA**") and the Fisheries Act.

The Fisheries Act applies to any body of water that may contain fish. As a result, the Department of Fisheries and Oceans applies the "no net loss" guiding principle, so that unavoidable fish habitat losses as a result of development Projects are balanced by newly created and/or restored fish habitat. Emphasis should be made in developing a construction procedure for the causeway and dams that will include work plans to limit fish mortality.

Table 20.1 identifies the main permits and authorizations falling within both provincial and federal jurisdiction that will be required for the construction and operation of the Project.

Table 20.1 – Preliminary List of Provincial and Federal of Required Permits and Approvals

Project Component	Ministry and Applicable Law/Rule/Guideline	Documentation Required
Bulk Sample Collection for Test Work	Ministry of Northern Development and Mines Mining Act (Ontario Regulation 240/00) Public Lands Act (Ontario Regulation 349/98)	Closure plan and work permit
Construction of Dams	Ministry of Natural Resources ("**MNR**") Public Lands Act (Ontario Regulations 975/90 and 453/96)	Permit request
	Ministry of Natural Resources (MNR) Lakes and Rivers Improvement Act (Ontario Regulation 454/96)	Permit request
	Department of Fisheries and Oceans ("**DFO**") Fisheries Act (Regulation SOR/93-53)	Fish habitat authorisation and compensation plan.
Construction of Electrical Transmission Line	Ministry of Environment Environmental Assessment Act	Class Environmental Assessment
Settling Ponds and Tailings Dams	Ministry of Environment Environmental Protection Act (Regulation 560/94) Water Resources Act (Regulation 561/94)	Certificate of approval
Air Emission	Ministry of Environment Environmental Protection Act (Regulation 419/05)	Certificate of approval
Waste Generation	Ministry of Environment Environmental Protection Act (Regulation 347/90)	Permit
Water Abstraction	Ministry of Environment Environmental Protection Act (Regulation 387/04)	Permit
Building Construction Permit	Municipality (Building Code)	Permit
Building Construction on Crown Land	Ministry of Naturally Resources (MNR) Environmental Assessment act	Certificate of approval

Project Component	Ministry and Applicable Law/Rule/Guideline	Documentation Required
Designated Project : Mine Site Development (Mine, Concentrator, Pipeline and Filtration Plant), with Federal Interest	Canadian Environmental Assessment Agency (triggered by Regulations Designating Physical Activities (SOR/2012-147))	Environment Assessment approval
Mine Site Development (Mine, Concentrator, Pipeline and Filtration Plant), with Provincial Interest	Ministry of Natural resources (MNR) Public Lands Act (Regulation 975/90 and Regulation 453/96)	Work permit
Mine Site Development	Occupational Health and Safety Act (Regulation 854/90-mines and mining plants)	Pre-development review process
Aggregate Extraction	Aggregate Resources Act (Regulation 244/97)	Aggregate permit
Development of Mining Process Facilities with Emissions to Water	Environmental Protection Act (discharge of industrial wastewater to surface water)	Certificate of approval
Waste Management – (if a Waste Disposal Site Construction and Operation will be Required for Project)	Environment Protection Act	Certificate of approval
Sewage Treatment Facility – Construction and Operation	Environment Protection Act	Certificate of approval
Explosive Magazines	Explosives Act (Section7)	Permit
Mine Closure Plan	Mining Act (Regulation 240/00)	Verification of closure plan completion

20.3 Project Stakeholders

The Project Stakeholders should be identified early in the Project and their issues/potential impacts/concerns should be monitored closely. WGM 2011 Technical Report has identified sets of logging roads permitted to Mackenzie ("**Buchanan**") Forest Products Inc. and the use of a concession for exploration camp granted to Bowater Canadian Forest Products Inc. In addition, it is expected that Lake St. Joseph tourist operators, Ministry of the Environment ("**MOE**") and First Nations communities will need to be consulted.

20.3.1 First Nations

In its 2011 Technical Report, WGM had identified the local communities in the Lake St. Joseph area. There are two (2) principle Ojibway Aboriginal communities in the immediate area of the Property, namely the Mishkeegogmang First Nation and the Slate Falls First Nation. The Mishkeegogmang First Nation communities are located along Highway 599 at the east end of Lake St. Joseph and include at least 10 settlements with a total population of 1,774, including two (2) reserves. The Osnaburgh 63A Reserve, which includes the village of Mishkeegogamang, is located at the northeast end of the Lake. The Osnaburgh 63B Reserve is located south of the Lake. Connie Gray-McKay is the Chief of Mishkeegogmang.

The Aboriginal community of Slate Falls is located approximately 40 km northwest of the Property. Slate Falls has a population of about 260 and is a member of the Windigo First Nations Council and its chief is Lorraine Crane.

Both the Mishkeegogamang First Nations/Communities, and the Slate Falls Nation/Community are members of the Nishnawbe-Aski Nation ("**NAN**") political organization of northwestern Ontario.

The Mishkeegogamang/Slate Falls First Nations' traditional lands include the Lake St. Joseph area. These lands were ceded to the Crown by treaties under certain conditions.

The Ontario government strongly recommends that mining companies maintain dialog with local Aboriginal communities so activities can be coordinated to avoid any conflict between exploration and harvesting activities.

The Mining Act was recently revised (April 2013) and emphasis on the requirement for Aboriginal consultation was made.

Rockex has already made initial contacts with the two (2) main First Nations communities concerned and has notified them of its exploration activities. Met-Chem agrees with WGM recommendations that these notifications continue and that regular meetings are held to foster a good relationship.

Met-Chem understands that management of Rockex have met with representatives of the Mishkeegogamang and Slate Falls communities. Apparently most of the discussions centered around the conduct of exploration activities on its claims and employment opportunities among members of those communities that a mining operation may generate of the Property.

20.4 Mine Closure and Rehabilitation

20.4.1 Introduction

The requirements for closure plan are identified under the Ontario Mining Act in Schedule 1 and 2.

The objective of these regulations is to ensure that water quality is unimpaired by mining development activity, and that surface water can continue to support aquatic life, and surface and groundwater remain suitable for other uses. Monitoring programs of approved closure plans will be tailored for the specific site.

The closure plan, that needs to be approved before the onset of the operations, will need to disclose the following information:

- Project Information;
- Current Project Site Conditions;
- Project Description;
- Progressive Rehabilitation;
- Rehabilitation Measures-Temporary Suspension;
- Rehabilitation Measures-State of Inactivity;
- Rehabilitation Measures-Closed Out;
- Monitoring;
- Expected site Conditions;
- Costs;
- Financial Assurance.

The security payment of the costs of rehabilitating the accumulation areas is to be posted starting year 1. Provision has therefore been made in the economic analysis for the disbursement of 100% of the estimated cost of rehabilitation of tailings storage facility and waste rock dumps in the first year of the Project.

Preliminary closure plan costs have been estimated based on the rehabilitation of the tailings disposal area and the waste rock disposal area.

20.4.2 Closure Cost

The preliminary cost estimate of the rehabilitation and closure plan is based on the re-sloping and revegetation of the tailings storage facility and the re-vegetation of the top and berms of the waste rock dumps, which usually represents the largest proportion of rehabilitation costs.

Since most of the core samples have been tested with a % S less than 0.3%, it was assumed that neither the tailings nor waste rock should be acid generating.

Preliminary rehabilitation design of tailings pond and waste rock stockpile is based on a layer of overburden and re-vegetation.

Based on the accumulation areas identified in Table 20.2 the total cost for the rehabilitation of the tailings storage facility and waste rock dumps has been estimated at $65.7 M. It is assumed that any topsoil or overburden made available through mining will be reused in the rehabilitation.

Table 20.2 – Accumulation Areas for Waste Rock Dump and Tailings Storage Facility

Accumulation Areas	Unit	Area
Tailings Pond (years 1 to 30)	m^2	17,583,000
Waste Rock Dump Area	m^2	2,951,000

The site rehabilitation and closure plan will be reviewed as the Project advances through pre-feasibility study and construction stage to include baseline studies results as well as revegetation site parcel studies to assess plant growth potential.

20.5 Recommendations

Meetings and consultation with Stakeholders should continue as the Project progresses to pre-feasibility study.

A summary table of issues/potential impacts identified by stakeholders should be maintained closely.

A detailed schedule of environmental permitting requirements will need to be prepared. This schedule should be integrated in the master schedule of the Project.

It is recommended to conduct acid rock drainage and metal leaching testing on mine rock and tailings samples.

21.0 CAPITAL AND OPERATING COSTS

21.1 Capital Costs

21.1.1 Scope of the Estimate

The capital cost estimate includes the material, equipment, labour and freight required for the mine pre-development, mine equipment, processing facilities, tailings storage and water management, pellet feed slurry transport, slurry dewatering, drying and loading on railcars, as well as infrastructure and services necessary to support the operation.

The estimate is based on Met-Chem's standard methods applicable for a PEA study to achieve the accuracy level of ± 35%.

21.1.2 Summary of the Estimate

All amounts are expressed in CAD dollars unless otherwise noted. The total life of mine ("**LOM**") capital cost for the 6 Mtpy pellet feed production rate scope of work is estimated at $2,168 M of which $1,559 M is initial capital and $609 M is sustaining capital as detailed below.

Table 21.1 – Summary of LOM Costs Estimate

Item Description	Total Rounded ($ Millions)
Direct Costs	1,155
Indirect Costs	404
Total Initial, Pre-Production Capital	**1,559**
LOM Sustaining Capital	609
LOM Total	**2,168**

The pre-production capital of $1,559 M cost includes $1,155 M for direct costs and $404 M for indirect costs including contingency. The direct capital costs and indirect capital costs are summarized in Table 21.2.

The sustaining capital costs are detailed in section 21.1.3.

Table 21.2 – Summary of Pre-Production Costs Estimate

Item Description	Total Rounded ($ Millions)
Direct Costs	
Open Pit Mine	
Mining Equipment	102.3
Mine Development	33.7
Mine Services and Facilities	1.2
Total Open Pit Mine	**137.2**
Process	
Crusher Area	25.6
Crushed Product Stockpile and Reclaim	35.1
Concentrator Area	400.7
Total Process	**461.4**
Tailings and Water Management Facilities	
Tailings Storage Facility	35.2
Tailings Pipelines and Spigot	1.3
Reclaim Water Pumping Station and Pipeline	3.9
Total Tailings and Water Management Facilities	**40.4**
Concentrate Pipelines	
Concentrate Pipelines and Systems	139.5
Total Concentrate Pipelines	**139.5**
Power and Communication at Mine Site	
Main Power at Mine Site	78.7
Power Distribution at Mine Site	11.9
Emergency Power at Mine Site	3.5
Communication at Mine Site	0.1
Total Power and Communication at Mine Site	**94.2**
Main Road to Mine Site and Helicopter Pad	
Main Road: Road upgrade and new Sections	11.5
Helicopter Pad and Hangar	0.3
Total Main Road to Mine Site and Helicopter Pad	**11.8**

Item Description	Total Rounded ($ Millions)
Permanent Camp at Mine Site	
Permanent Camp at Mine Site all included	11.5
Total Permanent Camp at Mine Site	**11.5**
Infrastructure at Mine Site	
Industrial Site Preparation and Drainage, Site Roads	9.8
Mine Vehicles Maintenance Building	8.1
Ancillary Buildings	7.8
General Services Mine Site	9.4
Service Vehicles and Equipment	5.0
Total Infrastructure at Mine Site	**40.1**
Causeway and Dykes at Mine Site	
Causeway	12.1
Dykes (Sustaining Capital Only)	0.0
Total Causeway and Dykes at Mine Site	**12.1**
Process at Sioux Lookout Site	
Filtering and Drying	74.7
Storage and Railcar Loading	37.4
Total Process at Sioux Lookout Site	**112.1**
Power and Communication at Sioux Lookout Site	
Main Power	2.0
Power Distribution	5.0
Emergency Power	2.3
Communication	0.0
Total Power Communication at Sioux Lookout Site	**9.3**
Railroad Facilities at Sioux Lookout Site	
Railroad Facilities	4.3
Total Railroad Facilities at Sioux Lookout Site	**4.3**
Infrastructure at Sioux Lookout Site	
Industrial Site Preparation, Site Roads, Pond	6.1
Office Complex	1.5
Ancillary Buildings	1.8

Item Description	Total Rounded ($ Millions)
General Services	2.7
Service Vehicles and Equipment	1.7
Total Infrastructure at Sioux Lookout Site	**13.8**
Natural Gas Pipeline for Sioux Lookout Site	
Natural Gas Pipeline	67.0
Total Natural Gas Pipeline for Sioux Lookout Site	**67.0**
Total Direct Costs	**1,154.7**
Indirect Costs and Contingency	
Indirect Costs	173.2
Closure & Rehabilitation (Sustaining Capital Only)	0.0
Contingency	230.9
Total Indirect Costs and Contingency	**404.1**
Total Pre-Production Costs	**1,558.8**

21.1.3 Sustaining Capital Costs

The LOM sustaining capital is estimated at $609 M. Provisions are made for mining equipment, service equipment and process equipment replacement or major overhaul, tailings storage relocation and progressive expansion, as well as some additional infrastructure facilities and closure and rehabilitation costs.

The construction of the dykes in Lake St. Joseph will also take place after the beginning of production. The first dyke will be built in years 1 and 2 while the second dyke will be built in years 3 to 8.

The sustaining capital costs are summarized in Table 21.3.

Table 21.3 – Summary of Sustaining Capital Costs Estimate

Item Description	Total Rounded ($ Millions)
Open Pit Mine	292.1
Process Mine Site and Sioux Lookout Facilities	20.0
Tailings and Water Management Facilities	45.2
Infrastructure Mine Site and Sioux Lookout Facilities	16.0
Dykes	170.0
Closure and Rehabilitation Costs	65.7
Total Sustaining Capital Costs	**609.0**

21.1.4 Basis of Estimate – General

a) Base Date, Currency, Escalation

The base date for the cost estimate is the third quarter of 2013.

The capital costs estimate is expressed in CAD dollars. The exchange rate used is \$0.95 USD/\$1.00 CAD when quotations were received in US dollars.

No allowances for escalation or currency fluctuation are included.

b) Labour, Installation

i) Most of the installation costs are included in the unit rates or were estimated by factor.

ii) However, some installation costs are estimated by man hours, productivity loss factor and labour rate. The working calendar is assumed 7 days per week, 10 hours per day, and 4 weeks in, 1 week out turnaround. The man hours were established from in-house database or from construction estimating standards.

The labour productivity loss for the Project was established at 1.15 considering impact of major criteria only such as working calendar, availability of skilled labour and supervision, as well as northern site conditions.

The labour rate was established as an all-inclusive, mixed crew, average hourly cost to the owner of \$130, based on recent similar projects. Contractor's mobilization/demobilization and site management are included in the indirect costs.

21.1.5 Basis of Estimate – Mining

a) Mining Equipment

Major mining equipment such as haulage trucks, shovels and production drills will be purchased throughout the course of the mine life to maintain production requirements. Major equipment replacement was based on equipment life expectancy of approximately 60,000 operating hours for each piece of equipment.

Support and Service equipment will also be incurred as capital expenditures and will be replaced based on life expectancy.

b) Mine Development Cost

The mine development costs are comprised of all mine operating expenditures incurred during the pre-production phase of the Project. These costs were estimated by rate (\$/t, \$/m^2, \$/m^3) and also by lump sum capital expenditures. The following items comprise the different components of the mine development costs:

- Explosives;
- Dewatering;
- Clearing and Grubbing;
- Topsoil Removal and Stockpiling;
- Technical Services Equipment;
- Contractor for Overburden Removal;
- Manpower;
- Operation of Major, Support and Service Equipment.

c) Mine Capital Expenditure

The mine capital expenditure is comprised of all major support and service equipment required to facilitate the first year of production with the addition of capital for initial road construction and the integration of a dispatch system.

d) Mine Services and Facilities

The explosive preparation will be sub-contracted; facilities will be provided by the contractor. Provision is included for site preparation, foundations and fencing. Estimation was based on similar projects.

Provisions were also made for mine dispatch and software.

21.1.6 Basis of Estimate – Processing Areas, Mine Site and Sioux Lookout Site

a) Process Buildings

Process buildings were estimated by factors based on recent similar projects. Site preparation and ancillary buildings are included in the infrastructure section below.

b) Process Equipment

The process equipment list was derived from the flow sheets. For major equipment, two (2) or three (3) qualified suppliers submitted their budget proposal. The remaining equipment was estimated from either single source budget proposal or recent in-house databases from similar projects.

Equipment installation was estimated by factor based on recent similar projects. An allowance was also provided for special lifts, sub-contracts and construction material. Freight was established at 12% of the material and equipment value.

c) Process Piping

Process piping cost was estimated by factor.

d) Electricity and Instrumentation for the Process

Electricity, automation and instrumentation for the process were estimated by factors based on recent similar projects.

e) Services and Supplies

Services and supplies for the process were estimated by factors based on recent similar Projects. Services include mainly HVAC and dust collection ducting, local fire protection as well as plant air and water services distribution. Supplies include mainly living quarter's furniture, equipment and supplies, small shops tools and storage equipment, safety and security systems as well as special coatings if required.

21.1.7 Basis of Estimate – Concentrate Pipeline

The concentrate pipeline was estimated based on estimation from recent Projects, updated, benchmarked and also scaled for scope of supply and lengths. The pipeline will be buried alongside the road. Returning water pipeline is not required; a settling pond is provided at the Sioux Lookout site.

21.1.8 Basis of Estimate – Tailings, Mine Site

a) Tailings Storage

Preliminary requirements were established for the tailings storage facilities and storage dams' quantities were estimated. Cost estimation was done with unit rates based on recent similar projects. No water treatment is required.

b) Tailings Pipeline

Tailings pipeline and water reclaim pipeline were sized with preliminary data and quantities were derived from the site plans. The cost was estimated with unit rates from construction estimating standards.

21.1.9 Basis of Estimate – Infrastructure and Services, Mine Site and Sioux Lookout Site

a) Industrial Site Preparation, Main Road and Site Roads, Settling Pond

Preliminary requirements were established for site preparation at the mine site and Sioux Lookout site. The costs were estimated based on recent similar projects.

Existing main access road to the Mine Site will have to be upgraded over 20 km and new road will be required over 15 km. The lengths were established from the layout and cost was estimated based on recent similar projects, benchmarked and adjusted for local conditions.

Lengths for site roads at each Site were derived from layouts and the costs were also estimated based on recent similar projects.

Preliminary requirements were established for a settling pond at the Sioux Lookout site to clarify the water from the dewatering of the pellet feed from the pipeline. Estimation was done based on recent similar projects.

b) Ancillary Buildings and Facilities, Laboratory Equipment

At the mine site, provisions were made for a change house, a warehouse and cold warehouse storage facilities. No building is required for the emergency vehicles. The costs were estimated based on preliminary sizing and recent similar projects. An allowance was also made for laboratory equipment.

At the Sioux Lookout site, provisions were made for a gate house and parking area, a warehouse and a change house. The costs were estimated based on allowances from recent similar projects.

c) Camp at Mine Site

Preliminary requirements were established for the permanent camp at the mine site. Estimation was done based on quotes received for recent similar projects.

d) Office Complex

Preliminary requirements were established for the office complex at the Sioux Lookout site. The cost was estimated based on recent similar projects. At the mine site, the concentrator building and garage include some office areas.

e) Mine Vehicles Maintenance Building

At the mine site, preliminary requirements were established for the mine vehicles maintenance building including overhead crane, service equipment and supplies, washing facilities as well as tools and storage equipment. The cost was estimated based on recent similar projects and coordinated with the maintenance requirements of the mining equipment of the Project.

f) Service Vehicles and Equipment

At the mine site and Sioux Lookout site, allowances were added for service vehicles and equipment such as buses, pick-up trucks, earthwork, material handling and lifting equipment as well as emergency vehicles.

g) General Services

At the mine site, preliminary requirements were established for general services including fuel storage and distribution, fresh water supply, sanitary and waste management, truck scale and fire protection general systems. The fuel storage requirements at mine site were established for two (2) weeks of production.

At the Sioux Lookout site, preliminary requirements were established for the general services, fresh water supply, sanitary and waste management, truck scale and fire protection general systems.

The costs were established based on recent similar projects.

21.1.10 Basis of Estimate – Power and Communication

Preliminary requirements were established for power and communication at the mine site and Sioux Lookout site.

For both sites, the power and communication area includes a main power line from the nearest Ontario Hydro sub-station, a main sub-station, the pole line site distribution, emergency generator sets and communication equipment and facilities.

Preliminary quantities were derived from the single line diagrams for the electrical material, equipment and accessories and estimations were done with unit rates, installation man hours and labour hourly rate based on in-house database. Estimations for communication were based on recent similar projects.

21.1.11 Basis of Estimate – Indirect Costs

An overall provision for indirect costs and contingency was established by factor applied to direct costs. The indirect costs typically cover for the major items listed here and detailed below: Project Development, Project Implementation and Financial Costs.

Project development owner's costs usually include: permitting process, land acquisition, administration, NSR buyout, exploration and drilling program, engineering studies (pre-feasibility and feasibility studies as well as any independent review), environmental impact assessment, metallurgical testing, geotechnical and occupational hazard studies, social impact studies and community relations, pre-production operation group and legal fees.

Project implementation costs include but are not limited to EPCM and owner's costs including spares, first fills, commissioning and other owner's costs.

- EPCM includes Detailed Engineering, Procurement and Construction Management as well as commissioning assistance and site assistance;
- Spares, first fills and commissioning include capital and commissioning spare parts, capital first fills, dry, wet commissioning that includes vendors' representatives on site;
- Other owner's costs include contractor's indirect, owner's construction indirect, owner's Project team, room & board and transportation of workers to the Project site as well as financial costs;
- Financial costs included in the estimate provides for insurance. Sales taxes and duties are excluded from the capital costs estimate as well as from the economic analysis. Escalation and interests incurred during construction are excluded from the capital costs. Working capital is excluded from the capital costs but provision for three (3) months of operation cost is considered in the economic analysis.

As mentioned before, contingency provision is also included in the above amount.

21.1.12 Closure and Rehabilitation Costs

Provisions are made for closure and rehabilitation costs in the sustaining capital, based on details given in Section 20.0. It is assumed that the salvage value of the equipment will cover the closure cost of the industrial sites.

21.2 Operating Costs

This Section provides information on the estimated operating costs of the Eagle Island Project and covers mining, concentrator plant, Sioux Lookout area, railroad, G&A and site services.

The sources of information used to develop the operating costs include in-house databases and outside sources particularly for materials, services and consumables.

21.2.1 Summary Operating Costs

The life of mine average operating costs estimate is summarized in Table 21.4.

Table 21.4 – Summary of Life of Mine Average Operating Costs Estimate

Area	Average Operating Costs ($/Tonne of Pellet Feed)
Mining	12.76
Concentrator Plant	18.05
Sioux Lookout Area	1.83
Railroad	0.20
G&A and Site Services	3.79
Total Operating Costs	**36.63**

21.2.2 Summary of Personnel Requirements

Table 21.5 presents the estimated personnel requirements for the Eagle Island operation by area.

Table 21.5 – Total Personnel Requirement

Area	Number
Mine	180
Concentrator Plant	114
Sioux Lookout Area	36
Railroad	6
G&A and Site Services	49
Total Manpower	**385**

Total annual costs for the above manpower including base salary, bonus and fringe benefits have been estimated at $20.4 M for mining, $13.2 M for Concentrator Plant, $2.5 M at Sioux Lookout area, $0.72 M at Railroad area and $5.4 M for G&A and site services.

21.2.3 Mining

The mine operating cost was estimated for each period of the mine plan. This cost is based on operating the equipment, the manpower associated with operating the mine, the cost for explosives as well as pit dewatering, road maintenance and other activities.

In order to determine the operating cost, the following assumptions were used:

- Diesel Fuel Price – $1.0/L;
- Explosives Cost – $0.40/t;
- Overburden Contract – $3.5/t.

The mine operating cost was estimated to average $2.97/t mined for the life of the open pit mine. This cost is divided into $2.79/t for mineralization, $3.50/t for overburden and $3.51/t for waste rock (see Table 21.6).

Table 21.6 – Summary of Estimated Mine Operating Costs by Type of Material

Type of Material	Costs ($/t Mined)	Costs ($/t Pellet Feed)	Total (%)
Mineralization	2.79	7.98	63
Overburden	3.50	0.43	3
Waste	3.31	4.34	34
Total	**2.97**	**12.76**	**100**

a) Operating Cost Breakdown by Major Components

Table 21.7 and Table 21.8 provide a breakdown of the mine operating costs into several major components.

Table 21.7 – Operating Costs Breakdown (Manpower and Activities)

Category	Costs ($/t Mined)	Costs ($/t Pellet Feed)	Total (%)
Loading	0.23	0.99	8
Hauling	0.94	4.04	32
Drilling & Blasting	0.55	2.36	19
Support & Service	0.34	1.48	12
Manpower	0.78	3.36	26
Other	0.12	0.53	4
Total	**2.97**	**12.76**	**100**

Table 21.8 – Operating Costs Breakdown (Manpower and Consumables)

Consumables	Costs ($/t Mined)	Costs ($/t Pellet Feed)	Total (%)
Fuel	0.81	3.48	27
Tires	0.21	0.90	7
Repair / Parts	0.68	2.93	23
Explosives	0.39	1.66	13
Manpower	0.78	3.36	26
Other	0.10	0.44	3
Total	**2.97**	**12.76**	**100**

b) Mining Equipment

The hourly operating cost for most of the mining equipment was supplied by the equipment suppliers and manufacturer. These were used to develop the operating costs. For certain equipment where hourly operating cost estimates were not obtained, Met-Chem used its internal database. Table 21.9 provides a detailed breakdown of the hourly operating cost for each piece of equipment in the mining fleet.

Table 21.9 – Equipment Hourly Operating Costs

Equipment	Description	Fuel ($/h)	Tires ($/h)	Parts ($/h)	Total ($/h)
Major Equipment					
Truck	Payload – 218 tonnes	170.00	68.00	95.00	333.00
Shovel	Payload – 70 tonnes	400.00	n/a	500.00	900.00
Production Drill	229 mm hole	200.00	n/a	300.00	500.00
Support Equipment					
Track Dozer	433 kW	80.00	n/a	50.00	130.00
Road Grader	225 kW	33.50	6.00	48.00	87.50
Utility Loader	Payload – 37 tonnes	178.50	75.00	185.00	438.50
Utility Backhoe	390 kW	52.00	n/a	35.00	87.00
Water / Sand Truck		95.00	25.00	70.00	190.00
Secondary Drill	165 mm hole	42.00	n/a	143.05	185.05
Lighting Plant	8 kW	2.65	n/a	0.62	3.27
Service Equipment					
Fuel and Lube Truck	n/a	9.63	3.50	3.32	16.45
Mechanic Truck	n/a	9.63	3.50	2.88	16.01
Tire Handler	n/a	14.00	2.28	10.00	26.28
Boom Truck	Capacity - 22 tonnes	9.63	3.50	3.32	16.45
Lowboy	Capacity - 150 tonnes	9.63	6.00	4.00	19.63
Mobile Crane	Capacity - 75 tonnes	11.00	6.00	6.42	23.42
Pick-up Truck		9.00	0.14	1.00	10.14
Transport Bus	20 seats	12.00	0.40	3.00	15.40

c) Manpower Salaries

The manpower cost for mine operations was estimated to be $20.4 M per year. This salary is calculated based on the number of employees and their annual salaries. A 30% fringe benefit cost has been included for the staff employees. A 30% fringe benefit cost and 5% overtime cost has been included for the hourly employees. Table 21.10 provides a summary of base salaries per employment category.

Table 21.10 – Salaries

Description	Hourly Rate ($/hr)	Base Salary ($/yr)	Total Salary ($/yr)
Supervision and Engineering			
Mine Superintendent		180,000	234,000
Maintenance Superintendent		150,000	195,000
Pit Foreman		105,000	136,500
Maintenance Foreman		105,000	136,500
Mining Engineer		110,000	143,000
Geologist		110,000	143,000
Surveyor		75,000	97,500
Mine Operations			
Truck Operator	40.00	83,200	112,320
Shovel Operator	40.00	83,200	112,320
Drill Operator	40.00	83,200	112,320
Dozer Operator	40.00	83,200	112,320
Grader Operator	40.00	83,200	112,320
Water Truck Operator	40.00	83,200	112,320
Mechanic	43.00	89,440	120,744
Tool Crib Attendant	25.00	52,000	70,200
Fuel / Lube Truck Driver	40.00	83,200	112,320
Blaster	40.00	83,200	112,320
Labourer	25.00	52,000	70,200
Utility Operator	35.00	72,800	98,280

21.2.4 Processing

For a typical year at a 6 Mtpy pellet feed production rate, the process operating costs are divided into the Concentrator Plant and Sioux Lookout area and are summarized in Table 21.11.

For the concentrator plant, the operating costs are subdivided into these components: manpower (labour), electricity, consumables and wear parts consumption, grinding media and reagents and material handling. For the Sioux Lookout area, the operating costs are subdivided into these components: manpower (labour), electricity, consumables and wear parts consumption, material handling and fuel for drying.

These costs were derived from supplier information, Met-Chem's database or factored from similar operations.

Table 21.11 – Summary of Average Annual Process Plant Operating Costs

	Costs ($ per Year)	Costs ($/t of Pellet Feed[1])
Concentrator Plant		
Ore Processing Plant (Areas 100 to 600, 700, 900)		
Manpower	13 161 500	2.19
Electricity [2)]	41 149 056	6.86
Consumables and Wear Parts Consumption	9 032 989	1.51
Grinding Media and Reagents	43 878 580	7.31
Material Handling [3)]	1 062 978	0.18
Sub-total	**108 285 103**	**18.05**
Sioux Lookout		
Filtration, Drying and Loadout (Areas 625 & 650)		
Manpower	3 901 000	0.65
Electricity [2)]	2 672 018	0.45
Consumables and Wear Parts Consumption	1 484 781	0.25
Material Handling [3)]	230 489	0.04
Fuel for Drying [4)]	2 669 522	0.44
Sub-total	**10 957 810**	**1.83**
Total Process Operating Costs	**119 242 912**	**19.87**

1) Based on production of 6 Mtpy of pellet feed.
2) Power cost is CAD $0.07 /kW-h
3) Based on LFO price of CAD $1.00 per litre. Based on lube oil price of CAD $3.50 per litre.
4) Based on Natural Gas price of CAD $0.13 per cubic meters.

a) Labour Cost

In the concentrator plant, it is estimated that there will be 114 employees. This includes the supervision staff for the process plant, crushing, the operation shift employees as well as the mechanical and electrical repairmen for the same areas. The total annual cost of labour for the concentrator plant is estimated at $13.2 M per year. This corresponds to $2.19 per tonne of pellet feed produced. At Sioux Lookout, it is estimated that there will be 36 employees. The total annual cost for labour at Sioux Lookout is estimated at $3.9 M per year. This corresponds to $0.65 per tonne of pellet feed produced.

b) Electrical Power

Electrical power is required for the equipment in the process plant such as: crushers, grinding mills, conveyors, magnetic separators, pumps, services (compressed air and water), etc. The unit cost of electricity was estimated at $0.07/kWh. For the concentrator plant, the annual estimated cost is $41.1 M or $6.86 per tonne of pellet feed produced. At Sioux Lookout, the estimated cost is $0.45 per tonne of pellet feed produced.

c) Grinding Media, Reagents and Consumables

The consumables and reagents have been divided in three (3) components that are described below:

i) Consumables & Wear Parts

The consumption and cost for the bowls, mantles, screen decks and grinding mill liners for the different comminution equipment was obtained from the equipment suppliers and from experience with similar operations. All the equipment requiring wear items having been taken into account (conveyors, magnetic separators, cyclones, thickeners, pumps, etc.). The annual cost for consumables and wear parts is estimated at $10.5 M or $1.75 per tonne of pellet feed produced.

ii) Grinding Media

The grinding mills (SAG and ball mills) will need a regular addition of balls to replace the worn media and exercise the proper grinding action on the material. The media consumption has been estimated from the power input into the material based on steel consumption observed in similar operations. Balls will have to be added every day to maintain the steel load in the mills. The cost of grinding media for the grinding mills is estimated at $34.5 M per year or $5.76 per tonne of pellet feed produced.

iii) Flocculant & Reagents

Flocculant is required for the thickeners. Lime is required in the concentrate pipeline. Reagents, such as sodium hydroxide, sodium silicate and caustic starch, are required for desliming. The total cost is estimated at \$9.3 M per year or \$1.56 per tonne of pellet feed produced.

d) Other Costs

Other costs such as site material handling for concentrator plant were estimated at \$1.1 M or \$0.18 per tonne of pellet feed produced. Material handling at Sioux Lookout was estimated at \$0.2 M or \$0.04 per tonne of pellet feed produced. Also, natural gas is required for the rotary dryers. The natural gas consumption is estimated at 20.5 Mm^3 per year (operating during 4.5 months per year), for a total cost of \$2.7 M or \$0.44 per tonne of pellet feed produced.

21.2.5 General and Administration Costs

The General and Administration ("**G&A**") Costs for a typical year of 6 Mtpy pellet feed production rates are summarized in Table 21.12. The total annual G&A operating costs is estimated at \$8.1 M or \$1.35 per tonne of pellet feed.

Table 21.12 – Summary of General and Administration Costs

G&A Operating Costs	Costs (\$ Millions/y)	Costs (\$/t of Pellet Feed)
Administration - Manpower	3.8	0.64
Administration - Material & Services	4.0	0.67
Sub-total	**7.8**	**1.31**
Technical services - Manpower	-	-
Technical services – Material & Services	0.3	0.04
Sub-total	**0.3**	**0.04**
Total	**8.1**	**1.35**

a) G&A Labour Costs

The G&A manpower is estimated at 34 employees. This includes management, finance, materials management, human resources and environmental. The total annual cost for G&A labour is estimated at \$3.8 M per year or \$0.64 per tonne of pellet feed.

b) Other G&A Costs

The G&A costs also covers administration material and services. This portion of the G&A costs accounts for \$4.0 M per year or \$0.67 per tonne of pellet feed.

This includes management and material services (security, leases, taxes, insurances, travel expenses for all employees, communication, office supplies, IT supplies and miscellaneous supplies), human resources, materials and environment supplies.

The technical services manpower is included in the mining operating costs. The technical services material and services accounts for \$0.3 M per year or \$0.04 per tonne of pellet feed. This includes computers (maintenance and supplies), engineering services and geology costs and laboratory consumables.

21.2.6 Site Services Costs

The site services costs for a typical year of 6 Mtpy pellet feed production rates are summarized in Table 21.13.

Table 21.13 – Summary of Site Services Costs

Site Services Operating Costs	Cost ($ Millions/y)	Cost ($/t of ¨Pellet Feed)
Infrastructure – Manpower	1.6	0.27
Infrastructure – Material & Services	13.0	2.17
Total	14.6	2.44

The total annual site services operating cost is estimated at $14.6 M or $2.44 per tonne of pellet feed.

a) Site Services Labour Costs

The site services manpower is estimated at 15 employees. This includes staff employees (superintendent and planner), hourly employees (electricians and general tradesmen) and equipment operators). The total costs for Site Services labour is estimated at $1.6 M per year or $0.27 per tonne of pellet feed.

b) Other Site Services Costs

The site services costs also cover material and services. This portion of site services costs accounts for $13.0 M per year or $2.17 per tonne of pellet feed.

This includes but is not limited to materials and services for camps, room and board, potable water consumables, power for infrastructure, mobile equipment operation and maintenance (others than mining equipment) and power lines maintenance.

21.2.7 Railroad Costs

The railroad manpower is estimated at six (6) employees ($120,000 per year for each employee), for a total of $720,000 per year. The railroad equipment and material operating costs are estimated at $480,000 per year.

The operating costs for the railroad are estimated at about $1.2 M per year or $0.20 per tonne of pellet feed.

22.0 ECONOMIC ANALYSIS

An economic/financial analysis has been carried out for the Eagle Island Project using an annual pellet feed production rate of 6 Mt.

A cash flow model is constructed on an annual basis in constant money terms (third quarter 2013). No provision is made for the effects of inflation. The assessment of the Project is based on unlevered cash flows (i.e. ignoring debt borrowing, interest on debt and debt repayment).

22.1 Macro-Economic Assumptions

The main base case macro-economic assumptions used are given in Table 22.1.

A long-term FOB Sioux Lookout price of 105 USD/t is assumed, the location from which the pellet feed is to be shipped to market. The sensitivity analysis examines a range of iron pellet feed prices 30% above and below the base case price.

Table 22.1 – Macro-Economic Assumptions

Item	Unit	Value
Iron Pellet Feed Price (FOB Sioux Lookout)	USD/t	105
Exchange Rate	USD/CAD	0.95
Base Case Discount Rate	% per year	8.0
Discount Rate Variants	% per year	5.0 & 10.0

A long-term exchange rate of 0.95 USD/CAD is assumed over the life of the Project.

The current Canadian tax system applicable to mining income is used to assess the Project's annual tax liabilities. This consists of federal and provincial corporate taxes as well as provincial mining taxes. The revisions announced in the March 21st 2013 federal budget speech concerning the reclassification of mine development expenses from Canadian Exploration Expenses ("**CEE**") to Canadian Development Expenses ("**CDE**"), and the elimination of the provision for accelerated depreciation for class 41A assets have been accounted for. Both changes are to be made progressively over a period of several years starting in 2015. It is assumed that Ontario will follow suit with the same changes in the provincial corporate tax rules. The federal and provincial corporate tax rates currently applicable over the Project's operating life are 15% and 10% of taxable income, respectively. Based on guidelines from the Ontario Mining Act, it is likely that if developed, this Project would be classified as a "remote mine" for the purpose of Ontario Mining Taxes (this requires ultimately a certification from the Minister of Northern Development and Mines). The rate applicable for the purpose of assessing Ontario mining taxes for remote mines is 5% of taxable income.

Results are presented on pre-tax and post-tax bases.

22.2 Mineral Royalties

The present financial analysis incorporates a royalty payment agreement. The agreement stipulates that a lump-sum payment of $250,000 be made in 2012, increasing by 10% per annum in subsequent years, up until the start of commercial production. After that time, the agreement provides for an NSR payment of 2% per annum. All lump-sum payments made prior to the start of commercial production are creditable against the NSR payments.

22.3 Technical Assumptions

The key technical assumptions used in the analysis are shown in Table 22.2.

Table 22.2 – Technical Assumptions

Item	Unit	Value
Life of Mine Mill Feed (for financial analysis)	Mt	512.3
Average Grade	% Fe	28.9
Processing Recovery	%	80.0
Average Stripping Ratio	Waste / Mineralization	0.505
Mine Life (for financial analysis)	Years	30
Annual Pellet Feed Production (66.3% Fe)	‘000 t	6,000
Operating Costs		
Mining	$/t conc.	12.76
Processing	$/t conc.	19.88
Others		
General & Administration Costs	$/t conc.	1.35
Site Services	$/t conc.	2.64
Total	**$/t conc.**	**36.63**
Total (Based on Financial Analysis)	**$/t milled**	**12.82**
Pre-production Capital Costs (Excluding Working Capital)	$ M	1,558.8
Initial Working Capital	$ M	48.1
Sustaining Capital Costs	$ M	543.3
Closure Costs	$ M	65.7

A reduced rate over the first six (6) months of production provides for a ramp-up to full capacity. On average, 17.3 M tonnes of run of mine material will be supplied per year to the process plant when full production is reached. The amount of pellet feed produced is a function of mill feed grade, processing recovery and pellet feed grade.

22.4 Financial Analysis Results

The financial evaluation results based on the parameters presented above are summarized in Table 22.3. A cash flow statement for the base case is given in Table 22.4.

For taxation purposes, all contingencies as well as owner's and contractor's indirect costs were redistributed by area, as shown in the cash flow statement. Also shown is a capital cost breakdown by area and a preliminary capital spending schedule over a 3-year pre-production period.

A working capital equivalent to three (3) months of total annual operating costs is maintained throughout the production period. As operating costs vary over the mine life, additional amounts of working capital are injected or withdrawn as required. The initial working capital requirement is estimated at $48.1 M.

The closure cost estimate of $65.7 M is assumed to be the product of a $36.2 M contribution to a rehabilitation fund in the first year of production. It is assumed the fund generates 2% interest per annum.

On a pre-tax basis, the NPV is $2,217.2 M at a discount rate of eight (8)%. The Project has an IRR of 20.7% and a payback period of 4.2 years.

On a post-tax basis, the NPV is $1,533.7 M at a discount rate of eight (8)%. The Project has an IRR of 18.1% and a payback period of 4.4 years.

Table 22.3 – Financial Analysis Results

Item	Unit	Value
Total Revenue	$ M	19,811.8
Total Operating Costs	$ M	6,565.9
Total Pre-Production Capital Costs (excluding Working Capital)	$ M	1,558.8
Total Sustaining Capital Costs	$ M	543.3
Total Closure Costs	$ M	65.7
Pre-Tax		
Total Cash Flow	$ M	10,712.2
Payback Period	Years	4.2
Net Present Value @ 5%	$ M	3.917.3
Net Present Value @ 8%	$ M	2,217.2
Net Present Value @ 10%	$ M	1,512.9
Internal Rate of Return	%	20.7
Post-Tax		
Total Cash Flow	$ M	7,881.3
Payback Period	Years	4.4
Net Present Value @ 5%	$ M	2,808.9
Net Present Value @ 8%	$ M	1,533.7
Net Present Value @ 10%	$ M	1,003.7
Internal Rate of Return	%	18.1

22.5 Sensitivity Analysis

A sensitivity analysis has been carried out, with the base case described above as a starting point, to assess the impact of changes in the iron concentrate price ("**Price**"), total pre-production capital costs ("**CAPEX**") and operating costs ("**OPEX**") on the Project's NPV @ 8% and IRR. Each variable is examined one-at-a-time. An interval of ± 30% with increments of 10% is used for all three (3) variables, while keeping all other parameters fixed.

Figure 22.1 and Figure 22.2 show the results of the sensitivity analysis on a pre-tax basis. These indicate that the Project's viability is not significantly vulnerable to variations in capital and operating cost estimates, taken one at-a-time. The NPV is more sensitive to variations in operating expenses, as shown by the steeper curves on the NPV diagram. However, as expected, the NPV is most sensitive to variations in Price. The internal rate of return is more sensitive to variations in capital costs than operating costs, as shown by the steeper slopes. Here as well, the IRR is most sensitive to variations in Price (the horizontal dashed line represents the base case discount rate of 8%).

Figure 22.3 and Figure 22.4 show the results of the sensitivity analysis on a post-tax basis. The same conclusions as those noted for the pre-tax situation can be drawn concerning the sensitivity of the post-tax financial indicators. The Project becomes marginal at the lower limit of the Price interval (i.e. at a relative variation of -30%, which corresponds to a pellet feed Price of USD 73.50/t). It is determined that the Project breaks-even (i.e. has an NPV equal to zero or an IRR of 8%) at a Price of about USD 68.70/t.

Table 22.4 – Cash Flow Statement

	Eagle Island Project Rockex Mining Corporation	LOM TOTAL	2015 Y=-3	Y=-2	Y=-1	Y=1	Y=2	Y=3	Y=4	Y=5	Y=6	Y=7	Y=8	Y=9	Y=10	Y=11	Y=12	Y=13	Y=14	Y=15	Y=16	Y=17	Y=18	Y=19	Y=20	Y=21	Y=22	Y=23	Y=24	Y=25	Y=26	Y=27	Y=28	Y=29	Y=30
66.3%	Concentrate Production (t)	179 250 000				5 250 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000
	Stripping Ratio	0.505				0.409	0.437	0.364	0.436	0.586	1.022	0.543	0.543	0.543	0.543	0.643	0.643	0.643	0.643	0.643	0.538	0.538	0.538	0.538	0.538	0.397	0.397	0.397	0.397	0.397	0.285	0.285	0.285	0.285	0.285
	REVENUE																																		
0.950	Exchange Rate (USD/CAD)																																		
105.00	Income Total	19 811 842 105				580 263 158	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895
	Indexed for sensitivity analysis	19 811 842 105				580 263 158	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895	663 157 895
	CAPEX INITIAL																																		
110	OPEN PIT MINE - Equipment and Services	139 711 600	0	27 942 320	111 769 280																														
110	OPEN PIT MINE - Development incl. Haul roads	45 571 000	0	9 114 200	36 456 800																														
120	PROCESS MINE SITE	622 958 369	124 591 674	280 331 266	218 035 429																														
130	TAILINGS AND WATER MANAGEMENT FACILITIES MINE SI	54 526 567	10 905 313	24 536 955	19 084 299																														
140	CONCENTRATE PIPELINE AND RECLAIM WATER PIPELINE	188 345 450	37 669 090	84 755 452	65 920 907																														
150	POWER AND COMMUNICATION MINE SITE	127 146 197	25 429 239	57 215 788	44 501 169																														
160	MAIN ROAD TO MINE SITE	15 889 500	3 177 900	7 150 275	5 561 325																														
180	CAMP MINE SITE	15 491 250	3 098 250	6 971 063	5 421 938																														
190	INFRASTRUCTURES MINE SITE	54 100 643	10 820 129	24 345 289	18 935 225																														
1AA	CAUSEWAY AND DYKES	16 394 400	3 278 880	7 377 480	5 738 040																														
220	PROCESS AREA SIOUX-LOOKOUT SITE	151 285 807	30 257 161	68 078 613	52 950 032																														
250	POWER AND COMMUNICATION SIOUX-LOOKOUT SITE	12 557 587	2 511 517	5 650 914	4 395 155																														
270	RAILROAD FACILITIES AT SIOUX-LOOKOUT SITE	5 751 000	1 150 200	2 587 950	2 012 850																														
290	INFRASTRUCTURES SIOUX-LOOKOUT SITE	109 041 188	21 808 238	49 068 534	38 164 416																														
	Capex Initial Total	1 558 770 556	274 697 591	655 126 100	628 946 865	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Indexed for sensitivity analysis	1 558 770 556	274 697 591	655 126 100	628 946 865	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CAPEX SUSTAINING																																		
110	OPEN PIT MINE (all costs assumed to be for equipment)	292 067 696				0	16 686 000	0	0	22 498 000	2 469 940	2 469 940	2 469 940	2 469 940	2 469 940	20 489 600	20 489 600	20 489 600	20 489 600	20 489 600	7 127 600	7 127 600	7 127 600	7 127 600	7 127 600	20 489 600	20 489 600	20 489 600	20 489 600	20 489 600	0	0	0	0	0
120	PROCESS MINE SITE	15 000 000				0	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241	517 241
130	TAILINGS AND WATER MANAGEMENT FACILITIES MINE SI	45 252 982				0	0	17 667 358	17 667 358	0	0	0	0	0	0	0	0	0	9 918 266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	CONCENTRATE PIPELINE AND RECLAIM WATER PIPELINE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	POWER AND COMMUNICATION MINE SITE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	MAIN ROAD TO MINE SITE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	CAMP MINE SITE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	INFRASTRUCTURES MINE SITE	12 000 000				0	1 333 333	1 333 333	1 333 333	1 333 333	1 333 333	1 333 333	1 333 333	1 333 333	1 333 333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1AA	CAUSEWAY AND DYKES	170 006 625				8 316 000	24 410 605	18 554 400	5 073 900	5 073 900	5 073 900	51 751 960	51 751 960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	PROCESS AREA SIOUX-LOOKOUT SITE	5 000 000				0	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414	172 414
250	POWER AND COMMUNICATION SIOUX-LOOKOUT SITE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	RAILROAD FACILITIES AT SIOUX-LOOKOUT SITE	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	INFRASTRUCTURES SIOUX-LOOKOUT SITE	4 000 000				0	444 444	444 444	444 444	444 444	444 444	444 444	444 444	444 444	444 444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Capex Sustaining Total	543 327 303	0	0	0	8 316 000	43 564 038	38 689 191	25 208 691	30 039 333	10 011 273	56 689 333	56 689 333	4 937 373	4 937 373	21 179 255	21 179 255	21 179 255	31 097 521	21 179 255	7 817 255	7 817 255	7 817 255	7 817 255	7 817 255	21 179 255	21 179 255	21 179 255	21 179 255	21 179 255	689 655	689 655	689 655	689 655	689 655
	Indexed for sensitivity analysis	543 327 303	0	0	0	8 316 000	43 564 038	38 689 191	25 208 691	30 039 333	10 011 273	56 689 333	56 689 333	4 937 373	4 937 373	21 179 255	21 179 255	21 179 255	31 097 521	21 179 255	7 817 255	7 817 255	7 817 255	7 817 255	7 817 255	21 179 255	21 179 255	21 179 255	21 179 255	21 179 255	689 655	689 655	689 655	689 655	689 655
	CLOSURE COSTS																																		
	Closure Costs Total (expense year 30)	65 653 224				36 245 234																													
	Indexed for sensitivity analysis	36 245 234				36 245 234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OPEX $/T CONCENTRATE																																		
12.76	Mining	2 287 230 000				66 990 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000	76 560 000
18.05	Process Mine Site incl. Pipeline	3 235 462 500				94 762 500	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000	108 300 000
2.44	Site Services Mine Site	437 370 000				12 810 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000	14 640 000
1.83	Process Sioux-Lookout incl. Stocking, Handling & Loading	328 027 500				9 607 500	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000	10 980 000
0.00	Site Services Sioux-Lookout (incl)	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.20	Railroad Network Sioux-Lookout	35 850 000				1 050 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000	1 200 000
1.35	G&A	241 987 500				7 087 500	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000	8 100 000
36.63	Opex Total	6 565 927 500				192 307 500	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000
	Indexed for sensitivity analysis	6 565 927 500				192 307 500	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000	219 780 000
	WORKING CAPITAL																																		
3.0	Working Capital Total	0			48 076 875	6 868 125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-54 945 000
	Indexed for sensitivity analysis	0			48 076 875	6 868 125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-54 945 000
	ROYALTY																																		
2.0%	NSR Royalty	395 409 342	332 750	366 025	402 628	9 676 361	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158	13 263 158
	2012-2013-2014 Payments	827 500																																	
	TAXES																																		
	Federal Corporate Taxes	1 537 009 629	0	0	0	0	0	0	12 063 397	55 908 795	56 726 324	55 912 625	55 138 477	56 583 540	57 858 754	58 456 495	58 562 373	58 615 255	58 450 382	58 313 729	58 638 647	59 126 503	59 487 938	59 755 893	59 954 674	59 851 694	59 522 851	59 275 469	59 089 409	58 949 496	59 228 485	59 821 726	60 266 531	60 600 047	60 850 122
	Provincial Corporate Taxes	810 989 211	0	0	0	0	0	0	4 736 711	29 275 387	29 811 329	28 921 001	28 347 077	29 566 278	30 384 331	30 809 514	30 950 871	31 039 205	31 000 093	30 962 094	31 145 782	31 404 571	31 595 691	31 736 950	31 841 438	31 793 516	31 631 592	31 509 649	31 417 843	31 348 743	31 488 837	31 785 878	32 008 574	32 175 537	32 300 719
	Ontario Mining Taxes	482 829 129	0	0	0	0	0	0	330 048	18 480 483	18 551 627	16 377 251	16 371 044	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940	18 759 940
	Corporate and Mining Taxes Total	2 830 827 969	0	0	0	0	0	0	17 130 156	103 664 665	105 089 279	101 210 877	99 856 598	104 909 758	107 003 025	108 025 949	108 273 183	108 414 400	108 210 415	108 035 764	108 544 369	109 291 014	109 843 568	110 252 782	110 556 052	110 405 150	109 914 383	109 545 059	109 267 191	109 058 179	109 477 261	110 367 543	111 035 045	111 535 524	111 910 781
	CASH FLOW																																		
	Before-tax Cash Flow Total	10 712 162 171	-275 030 341	-655 492 125	-677 426 367	326 849 938	386 550 699	391 425 546	404 906 046	400 075 404	420 103 464	373 425 404	373 425 404	425 177 364	425 177 364	408 935 482	408 935 482	408 935 482	399 017 216	408 935 482	422 297 482	422 297 482	422 297 482	422 297 482	422 297 482	408 935 482	408 935 482	408 935 482	408 935 482	408 935 482	429 425 082	429 425 082	429 425 082	429 425 082	484 370 082
	Cumulative Cash Flow		-275 030 341	-930 522 466	-1 607 948 834	-1 281 098 895	-894 548 196	-503 122 650	-98 216 604	301 858 800	721 962 264	1 095 387 667	1 468 813 071	1 893 990 435	2 319 167 799	2 728 103 281	3 137 038 763	3 545 974 245	3 944 991 461	4 353 926 943	4 776 224 425	5 198 521 907	5 620 819 388	6 043 116 870	6 465 414 352	6 874 349 834	7 283 285 316	7 692 220 798	8 101 156 280	8 510 091 762	8 939 516 844	9 368 941 926	9 798 367 007	10 227 792 089	10 712 162 171
	Payback period work area				1.00	1.00	1.00	1.00	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	After-tax Cash Flow Total	7 881 334 201	-275 030 341	-655 492 125	-677 426 367	326 849 938	386 550 699	391 425 546	387 775 890	296 410 739	315 014 184	272 214 527	273 568 806	320 267 606	318 174 339	300 909 533	300 662 299	300 521 082	290 806 801	300 899 719	313 753 113	313 006 468	312 453 914	312 044 699	311 741 430	298 530 332	299 021 099	299 390 424	299 668 291	299 877 303	319 947 820	319 057 538	318 390 037	317 889 557	372 459 301
	Cumulative Cash Flow		-275 030 341	-930 522 466	-1 607 948 834	-1 281 098 895	-894 548 196	-503 122 650	-115 346 760	181 063 979	496 078 164	768 292 691	1 041 861 496	1 362 129 103	1 680 303 442	1 981 212 975	2 281 875 274	2 582 396 355	2 873 203 157	3 174 102 875	3 487 855 988	3 800 862 456	4 113 316 369	4 425 361 069	4 737 102 498	5 035 632 831	5 334 653 930	5 634 044 354	5 933 712 644	6 233 589 948	6 553 537 768	6 872 595 306	7 190 985 343	7 508 874 900	7 881 334 201
	Payback period work area				1.00	1.00	1.00	1.00	1.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FINANCIAL INDICATORS

Before Tax			
Payback Period (years)		**4.2**	
NPV @ ... % ($)	5.0%	**3 917 325 289**	
NPV @ ... % ($)	8.0%	**2 217 248 134**	
NPV @ ... % ($)	10.0%	**1 512 930 921**	
Internal Rate of Return		**20.65%**	
After Tax			Effective Tax Rate
Payback Period (years)		**4.4**	26.4%
NPV @ ... % ($)	5.0%	**2 808 932 373**	28.3%
NPV @ ... % ($)	8.0%	**1 533 737 553**	30.8%
NPV @ ... % ($)	10.0%	**1 003 686 999**	33.7%
Internal Rate of Return		**18.07%**	

Change these for Sensitivity Analysis	
REVENUE Index (1 + relative change)	1.00
OPEX Indes (1 + relative change)	1.00
PRECAPEX Index (1 + relative change)	1.00
SUSCAPEX index (1 + relative change)	1.00

Figure 22.1 – Pre-tax $NPV_{8\%}$: Sensitivity to Pre-production Capital Cost, Operating Cost and Price

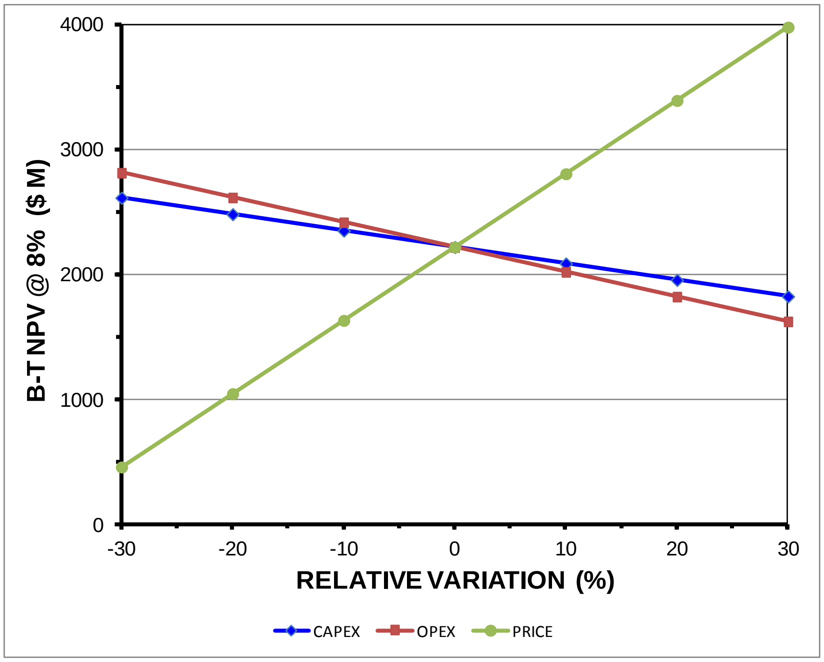


Figure 22.2 – Pre-tax IRR: Sensitivity to Pre-production Capital Cost, Operating Cost and Price

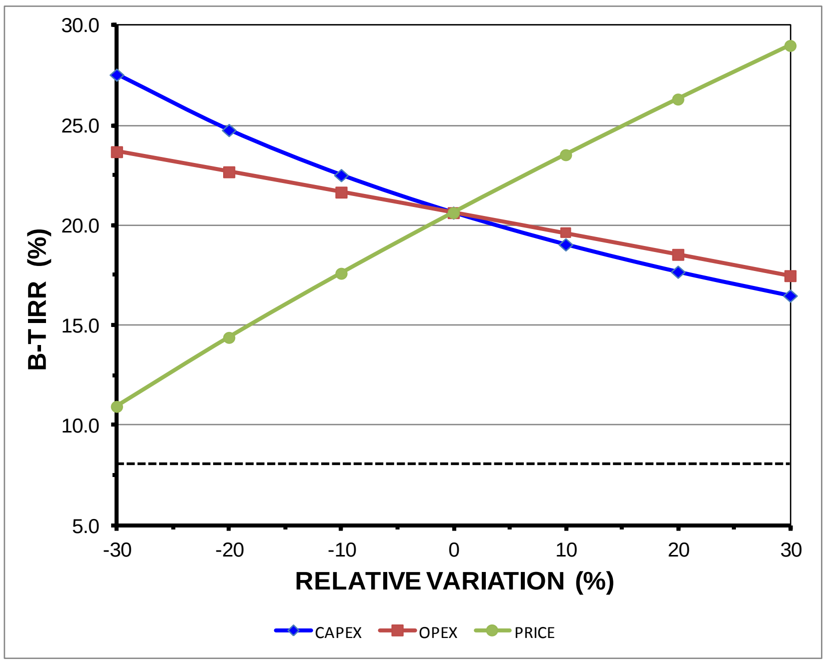


Figure 22.3 – Post-tax $NPV_{8\%}$: Sensitivity to Pre-production Capital Cost, Operating Cost and Price

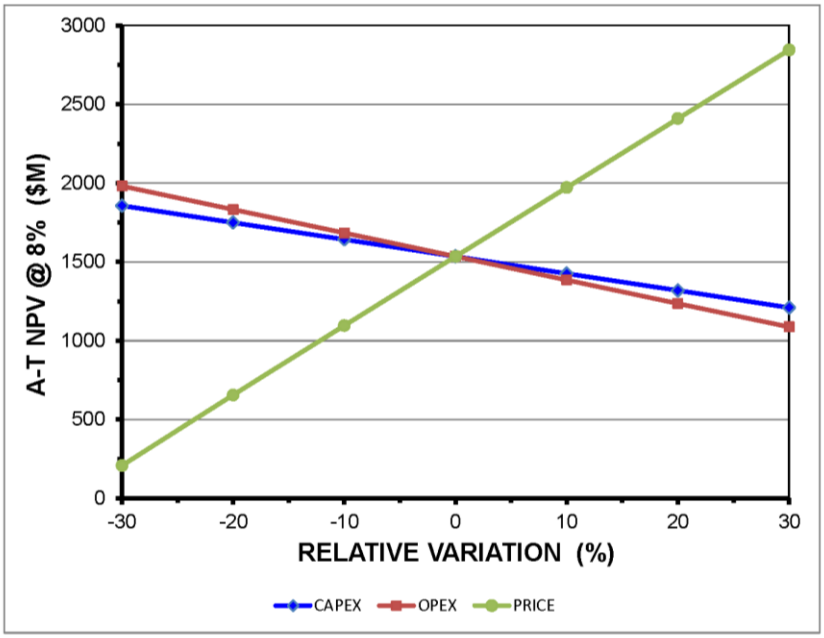
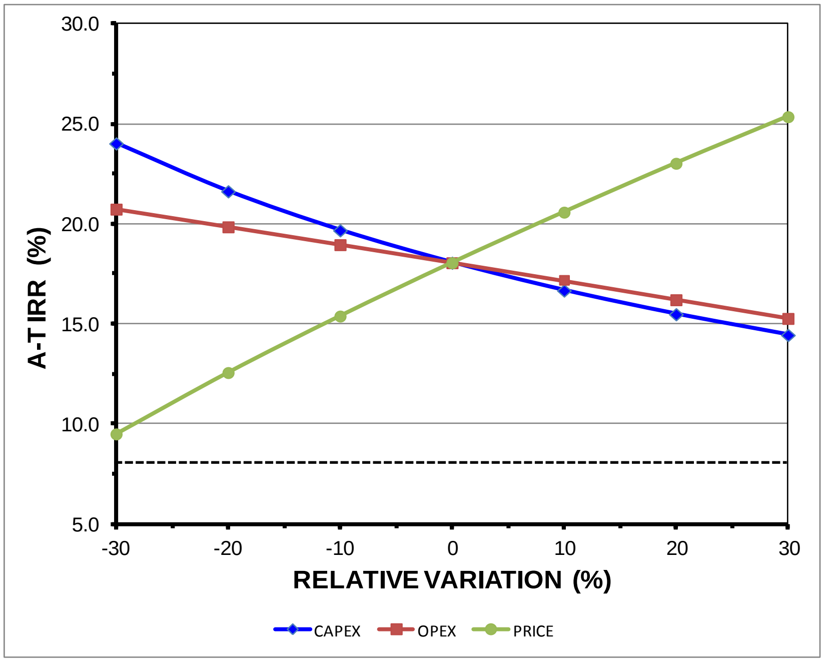


Figure 22.4 – Post-tax IRR: Sensitivity to Pre-production Capital Cost, Operating Cost and Price



23.0 ADJACENT PROPERTIES

No claims held by other parties are contiguous to the Property and no current exploration activities for iron deposits are taking place in the immediate vicinity of the Property. However, Rockex holds a 100% interest in two (2) other iron projects in relative close proximity to the Property:

- The East Soules Bay property consisting of 21 contiguous mining claims (1,616 hectares) in and along the eastern end of Lake St. Joseph, approximately 50 kilometres E-NE of Eagle Island;
- The Doran Lake property consisting of four (4) contiguous mining claims (784 hectares) located 40 km due east from Eagle Island in and along the north shore of Doran Lake. Between 1957 and 1960, the property was explored by ground magnetometer survey, about 2,300 m (7,500 ft) of diamond drilling culminating with a historical mineral resource estimate of historical nature.

Another iron property held by Sanjo Iron Mines Limited, a wholly-owned subsidiary of Steep Rock Iron Mines Limited, is located on the SW of the East Soules Bay property. The property covers part of the interpreted extension of the iron formation within the East Soules Bay claims. Between 1956 and 1961, the Sanjo property was tested by airborne and ground magnetometer surveys, by 8,622.8 m (28,290 ft) of diamond drilling, by shaft-sinking and crosscutting, bulk sampling (250 long tons) and metallurgical test work. The North Zone was explored over a strike length of about four (4) km and to a depth of about 200 m by 26 drill holes. The South Zones has been traced over a reported length of about 4.5 km, to a depth of 170 m, by 13 drill holes. This work culminated with a resource estimate.

No recent activity has been reported on these iron properties, except for an airborne magnetic survey over the Doran Lake area by Rockex in 2011.

The reader is advised that the information provided in this Section was publicly disclosed and is mostly drawn from assessment files, or maps and reports from the Ontario Department of Mines, derived from an Internet search. The qualified person has not attempted to verify the data and results and the presence of iron formation in adjacent properties is not necessarily indicative of the mineralization on the Property that is subject of the present Technical Report.

24.0 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information.

25.0 INTERPRETATION AND CONCLUSIONS

The exploration and drilling data available for the portion of the iron formation located on Eagle Island are sufficiently complete and adequate to support the estimation of the Mineral Resources estimate that served as the basis of the present PEA.

The Rockex Mining Corporation's Eagle Island Project pit design and mine plan were limited to a 30-year mine life for the PEA, even though there are sufficient Mineral Resources for a longer period. The 30-year pit that has been designed for the Eagle Island deposit is approximately 2,000 m long and 900 m wide at surface with a maximum pit depth of 400 m.

The pit includes 512 Mt of Mineral Resources with an average Fe grade of 28.9% and has a strip ratio of 0.51:1 with 26 Mt of overburden and 233 Mt of waste rock. Only 1.4% of the Mineral Resources contained within the pit are in the Inferred category.

The pit will be developed in three (3) phases in order to delay the dyke construction and lake dewatering. In phase 1, (years 1 to 2) the mine can be operated without the need for dyking. Phase 2 (years 3 to 8) requires a short temporary dyke and Phase 3 (years 9 to 30) requires the final dyke.

A production schedule (mine plan) was developed for the Eagle Island Project to produce 6 Mt of pellet feed per year. Using the mill recovery of 80% and a targeted pellet feed grade of 66.3% results in an average run of mine feed of 17.3 Mt per year at an average Fe grade of 28.9%.

The mineralization has a very fine grained mineralogy. As demonstrated by testing done by SGS, extensive grinding is required in order to achieve liberation of the iron oxide minerals (i.e. hematite/magnetite). The flow sheet uses conventional, proven, grinding, gravity, magnetic and decantation equipment to produce six (6) Mt per year of hematite/magnetite pellet feed (as with the feed, proportions of the minerals are a 50:50 ratio) grading at 66.3% Fe and 5.23% silica with a recovery of 80% of the Fe value and a weight recovery of 34.6%.

Test work's first goal was to validate the results achieved by Algoma in the mid-70s by duplicating their test work procedures. Once comparable test results were achieved, test work determined if higher % Fe grades and lower silica and gangue level could be obtained. Reverse flotation of the silicates was capable of producing pellet feeds with higher Fe grades with a correspondingly high impact on Fe recovery.

The final concentrate (pellet feed) is pumped via a slurry pipeline of about 135 km to Sioux Lookout where it is dewatered in filter presses, dried (cold season only), stockpiled and shipped by train to clients.

26.0 RECOMMENDATIONS

The estimated costs for the next phase represents $4.9 M. The detail costs are presented in Table 26.1 and the description in the next Sub-Sections.

Table 26.1 – Next Phase Estimated Costs

Activity	Estimated Costs ($)
Geotechnical Study	250,000
Hydrogeology Study	250,000
Test Work	
Optimization Bench Scale Test work	50,000
Lock Cycle Testing of the Flow Sheet	180,000
Pilot Scale Testing of Flow Sheet	320,000
Analysis of Test Work	340,000
Test Work Supervision	145,000
Environment Baseline and Studies	1,600,000
Pre-feasibility studies	1,500,000
Advanced Royalty Payment	250,000
Estimated Costs Total	**4,885,000**

26.1 Mining and Geology

- A more detailed survey should be carried out to determine the topographic elevations on Eagle Island, the thickness of overburden and the elevation of the lake bottom.
- Geotechnical and hydrogeological studies should be performed to further confirm rock slopes, rock permeability, ground and underground water flows in order to validate the open pit mining technical parameters.
- The maximum lake elevation should be reconfirmed with Ontario Hydro since the current letter dates from 1969.
- An in-depth geotechnical study should be carried out to validate the dyke design parameters.

26.2 Process

- To improve the iron recovery while maintaining the iron content above 65% and SiO_2 below 5%, the test work studies as in Section 13.5 above have to be optimised and reproduced in a variability study.
- Desliming test work needs to investigate to benefit of more recent reagents. Although the reagents used were effective, recent advances in desliming reagents may provide chemicals that provide superior results.

- The flow sheet has to be confirmed with both lock-cycle and pilot plant testing. The following test work should be included in the next stage of pre-feasibility and feasibility:

  a) Lock-Cycle Test Work

     The various stages of the process need to be tested in combination to determine how the processes combine together. A lock-cycle is required to determine overall process recovery and concentrate grade.

  b) Pilot Plant Test Work

     The pilot plant data will give significant amounts of additional data. Since this mineralization type is complex in nature, this step is of major importance to validate the adopted flow sheet.

  c) Comminution Test Work

     To improve the accuracy of the SAG mill sizing in the pre-feasibility phase, crushing and grinding test work is recommended to evaluate the variability of the ROM. Existing drill core samples should be used for this purpose. A JK Drop Weight Test should be performed on a representative composite of the mineralization as it will be mined while SMC Tests should be performed on the lithologies present to gauge the variability of the deposit.

  d) Concentrate Slurry Transport Test Work

     As this Section will be a major expense, for the pre-feasibility, slurry transport testing should be performed. Due to the fine nature of the pellet feed, rheology testing is needed, especially with a focus on the effect due to changes in pulp density.

  e) Concentrate and Pellet Feed Settling Test Work

     For the pre-feasibility study, settling testing for thickeners should be done. This can be done using a testing laboratory or a vendor facility.

  f) Pellet Feed Filtration Test Work

     For the pre-feasibility study, testing for filtration equipment should be done.

  g) Balling Design Parameter Test Work

     Balling test work is suggested, but not required for pre-feasibility. The balling design parameters should comprise of:

     i) Green pellet chemical analysis (including but not limited to the content of water, magnetite, hematite, elemental iron, dolomite, limestone, hydrated lime, blast furnace slag or scale and recycle fired pellets).

ii) Green pellet physical analysis (including green pellet size distribution, crushing strength, tumbler strength, porosity, specific gravity and bulk density).

h) Pot Grate Design Parameter Test Work

Pot Grate testing is suggested, but not required for pre-feasibility. To provide prospective customers with a proven quality product balling and pot grate test work be done.

The pot grate design parameters test work should be based on fired pellets and include:

i) Pre-heating (drying) time, temperature, air flow and heat requirements;

ii) Induration (cooking) time, temperature, air flow and heat requirements;

iii) Cooling time, temperature, air flow and heat requirements;

iv) Optimal hearth layer thickness for the above;

v) Fired pellet physical analysis (including fired pellet size distribution, crushing strength, tumbler strength, porosity, specific gravity and bulk density);

vi) Fired pellet chemical analysis (including assay results of fired pellet and analytical results of the minerals and mineralogical structure);

vii) Fired pellet metallurgical test work results (including reducibility, swelling reduction and softening).

i) Wet High Intensity Magnetic Separation

Testing of the tails from the LIMS circuit with a high intensity type of separation equipment should be further investigated. Due to the fine nature of the material at its liberation size, a SLON is the suggested device.

j) Hydraulic Separation Test Work

Testing of the material with a both a hydraulic classifier at the coarser size range and a reflux classifier at the finer size range may prove to be a potential process alternative for the mineralization.

26.3 Environment

- Meetings and consultation with stakeholders should continue as the Project advances to pre-feasibility study.
- Baseline field work should be initiated.
- Testing for acid rock drainage and metal leaching should be conducted on mine rock and tailings samples.

26.4 Opportunities

26.4.1 Mining

- The location of the causeway can be optimized to take advantage of areas of shallow depth.
- A more detailed optimization can be carried out to increase the Fe grade earlier in the mine life.
- A new technology is currently being developed to operate mine haul trucks with natural gas. This should be evaluated in the next stage of the Project since natural gas is an abundant commodity in the region.

26.4.2 Gravity Circuit

The amenability of the material to gravity techniques to both produce a concentrate and reject a tail is a process avenue that should be further explored and optimised. The more material that can either be rejected or concentrated via spirals will help improve the Project's CAPEX and OPEX. The resulting size of the test work feed material was finer than expected, i. e. a P_{80} of 88 μm was achieved from a target grind of P_{100} of 180 μm. Test work should target a coarser grind to match a size range more typical of spiral feed characteristics (i. e. 1,000 μm to 75 μm) and determine if similar quantities/qualities of concentrate can be produced. Alternatively, low sloped spirals designed for finer size distributions (i. e. 150 μm to 45 μm) can be investigated as replacement to the traditional spirals. Future gravity testing should explore screening of the feed prior to gravity testing to determine if greater selectivity can be gained, especially for the rejection of silicates.

26.4.3 Grinding

The replacement of the SAG mill by HPGRs may be of benefit to this Project as the improved energy efficiency of the HPGR in comparison to the SAG would help with the overall energy requirements of this mineralization. Additionally, the replacement of ball mills by vertical attrition grinding (i.e. tower mills) needs to be investigated, especially for the finer grinding applications. Attrition grinding offers improved efficiency and liberation characteristics for fine grinding applications compared to traditional ball mills. Equipment suppliers of the technology currently offer large power models which now allow the technology to compete on an economic basis with ball mills.

26.4.4 Infrastructure

Although industry best practice and applicable guidelines combined with recent available information have been used, it will be advisable to perform some trade-off studies and design optimisation while developing the engineering in the next phases. The following are some example of areas that could benefit from such an approach:

- Concentrate pipeline was assumed buried underground; examine the possibility of over ground installation;

- Electrical power lines, the natural gas pipeline and concentrate pipeline are independent; examine possibility of common routing;
- The crusher can be located on the island to reduce the haul truck requirements. The crushed rock can then be transported over the causeway via a conveyor;
- Although the design and location of the dykes ensure that the resources can be mined, there is room for optimization. This optimization can further reduce costs, timing and maximize resource recovery;
- A new electrical power line 40 km long tapped on the existing 115 kV line between Ear Falls and Pickle Lake will supply power to the St-Joseph site; examine the possibility to connect to the 230 kV Wataynikaneyap power line project planned for 2015.

27.0 REFERENCES

Albert, D. H., Cygnus Consulting Inc., "Assessment Work Report, Diamond Drilling Campaign on the Western Lake St. Joseph Property (2011), NTS 52J/14", June 22, 2012.

Barrette, J-P., and Dumoulin, M., "Drill Report, Western Lake ST. Joseph Iron Ore Project 2009, Trist Lake Area, Kenora Mines & Minerals Division, Ontario, NTS 52J/14NE", March 12, 2009.

Eckstrand, O.R., "Canadian Mineral Deposit Types: A Geological Synopsis", Geological Survey of Canada. Economic Geology Report 36, 86 pages, 1984.

Goodwin, A. M.; 1962; "Preliminary Report on the Geology of Pashkokogan Lake – Eastern Lake St. Joseph Area, District of Thunder Bay; Ontario Department of Mines"; December 1962.

Goodwin, A. M.; "Geology of Pashkokogan Lake – Eastern Lake St. Joseph Area, Geological Report No. 42; Ontario Department of Mines", 1965

Hanna Mining Co., "Memorandum to file from F.F. Rahne re: Eagle Island Progress Report 11/26/75", October 20, 1976.

Meyn, H.D. and P.A. Palonen, "Stratigraphy of an Archan Submarine Fan, Precambrian Research" pages 257-285, 1980.

SGS Lakefield Research Limited, "Investigation into the Mineralogical Characteristics of Four Samples of Iron Formation, petrographic microscopy, X-ray Diffraction, QEMSCAN and electron micro-probe analysis", 2008.

Watts, Griffis and McOuat, "Technical Report and Mineral Resource Estimate on the Western Lake St. Joseph Iron Ore Project, Ontario, Canada for Rockex Limited and Rockex Mining Corporation", January 28, 2011.

Appendix A – Detail Flow Sheets and Layouts

Flow Sheets

A1-2013-023-0201-0B – Primary Crushing, Coarse Ore Storage and Reclaim – Area 100 and 150

A1-2013-023-0202-0B – Grinding – Area 200

A1-2013-023-0203-0B – Spiral Separation – Area 300

A1-2013-023-0204-0B – Magnetic Separation – Area 400

A1-2013-023-0205-0B – Desliming – Area 500

A1-2013-023-0206-0B – Concentrate Pumping & Reception – Area 600

A1-2013-023-0207-0B – Water Management – Area 700

A1-2013-023-0208-0B – Concentrate Filtration & Drying – Area 650

A1-2013-023-0209-0B – Air Services – Concentrate Stockpile & Loadout – Area 650

A1-2013-023-0210-0B – Air Services & Reagents at Concentrator – Area 900

Layouts

A1-2013-023-0002-L-0A   Surface Facilities Layout

A1-2013-023-0003-L-0A – Primary Crushing, Stockpile & Reclaiming - General Layout

A1-2013-023-0004-L-0A – Process Plant Layout – Plan View

A1-2013-023-0005-L-0A – Process Plant Layout – Section

A1-2013-023-0011-L-0A – Sioux Lookout Railcar Loading Facility – General Arrangement

A1-2013-023-0012-L-0A – Sioux Lookout Concentrate Filtration – General Arrangement – Plan and Section

A1-2013-023-0013-L-0A – Concentrate Stockpile and Loadout – General Arrangement

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ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

PRIMARY CRUSHING, COARSE ORE STORAGE AND RECLAIM
AREAS 100 & 150
PROCESS FLOWSHEET

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

DESSIN NO. A1-2013-023-0201-F — REV. B

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A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

NO.	DATE/BY	TITLE

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MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

GRINDING
AREA 200
PROCESS FLOWSHEET

RESPONSIBLE ENGINEER	DATE	CHECKED	DATE
RYAN CUNNINGHAM, ing.	05/06/2013	CHARLES H. CAUCHON, ing.	2013/06/26
DESIGNED	DATE	APPROVED	DATE
WILLIAM SHADEED, ing.	05/06/2013	CHARLES H. CAUCHON, ing.	2013/06/26
DRAWN	DATE	SCALE	
D. VAN ZWYNDREGT	06/06/2013	N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

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EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

SPIRAL SEPARATION
AREA 300
PROCESS FLOWSHEET

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REFERENCE DRAWINGS	

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NO.	DATE/BY	TITLE
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REVISIONS		

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

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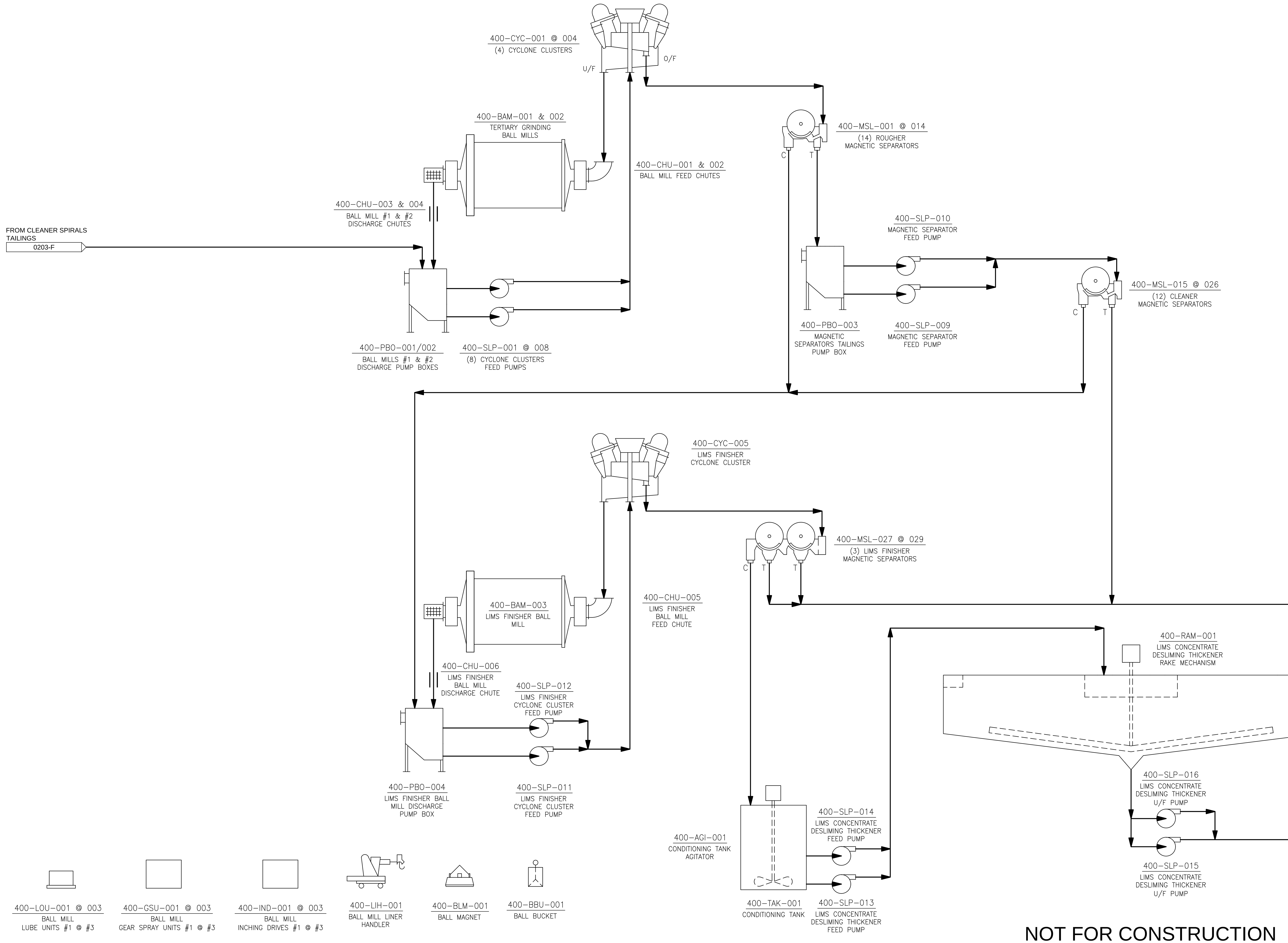

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EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

MAGNETIC SEPARATION
AREA 400
PROCESS FLOWSHEET

DRAWING NO	TITLE
REFERENCE DRAWINGS	

NO.	DATE/BY	TITLE
REVISIONS		

NO.	DATE/BY	TITLE
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REVISIONS		

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DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

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MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

DESLIMING
AREA 500
PROCESS FLOWSHEET

DRAWING NO	TITLE
REFERENCE DRAWINGS	

NO.	DATE/BY	TITLE
REVISIONS		

NO.	DATE/BY	TITLE
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A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION
REVISIONS		

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DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

DESSIN NO. A1-2013-023-0205-F

REV. B

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REVISIONS		

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

CONCENTRATE PUMPING & RECEPTION
AREA 600
PROCESS FLOWSHEET

DESSIN NO. A1-2013-023-0206-F REV. B

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PRELIMINARY

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26	PRELIMINARY ECONOMIC ASSESSMENT		
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26	WATER MANAGEMENT AREA 700 PROCESS FLOWSHEET		
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A				
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS		DESSIN NO. A1-2013-023-0207-F		REV. B

NO.	DATE/BY	TITLE
B	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA
A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION

REVISIONS

NO.	DATE/BY	TITLE

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

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NOT FOR CONSTRUCTION
PRELIMINARY

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

PRELIMINARY ECONOMIC ASSESSMENT

CONCENTRATE FILTRATION & DRYING
AREA 650
PROCESS FLOWSHEET

DESSIN NO. A1-2013-023-0208-F REV. B

NO.	DATE/BY	TITLE
B	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA
A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

NO.	DATE/BY	TITLE

REVISIONS

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ROCKEX MINING CORPORATION

MET-CHEM

NOT FOR CONSTRUCTION
PRELIMINARY

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT
AIR SERVICES
CONCENTRATE STOCKPILE & LOADOUT
AREA 650
PROCESS FLOWSHEET

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

DESSIN NO. A1-2013-023-0209-F REV. B

NO.	DATE/BY	TITLE
B	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA
A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

NO.	DATE/BY	TITLE

REVISIONS

NOT FOR CONSTRUCTION
PRELIMINARY

DRAWING NO	TITLE
REFERENCE DRAWINGS	

NO.	DATE/BY	TITLE
REVISIONS		

NO.	DATE/BY	TITLE
B	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA
A	2013/06/26 CHARLES H. CAUCHON, ing.	ISSUED FOR CLIENT INFORMATION
REVISIONS		

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 05/06/2013	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DESIGNED WILLIAM SHADEED, ing.	DATE 05/06/2013	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/06/26
DRAWN D. VAN ZWYNDREGT	DATE 06/06/2013	SCALE N/A	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT PROCESS	

ROCKEX MINING CORPORATION

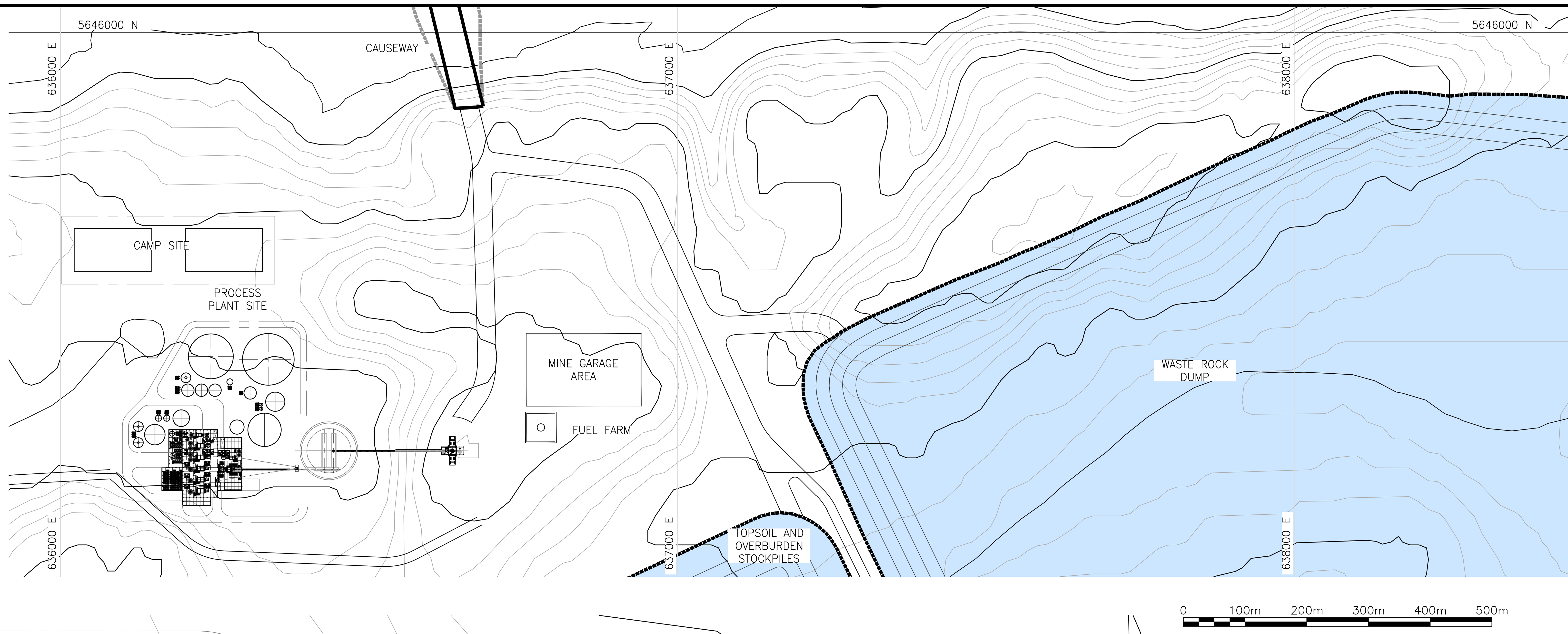
MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

AIR SERVICES & REAGENTS AT CONCENTRATOR
AREA 900
PROCESS FLOWSHEET

DESSIN NO. A1–2013–023–0210–F REV. B



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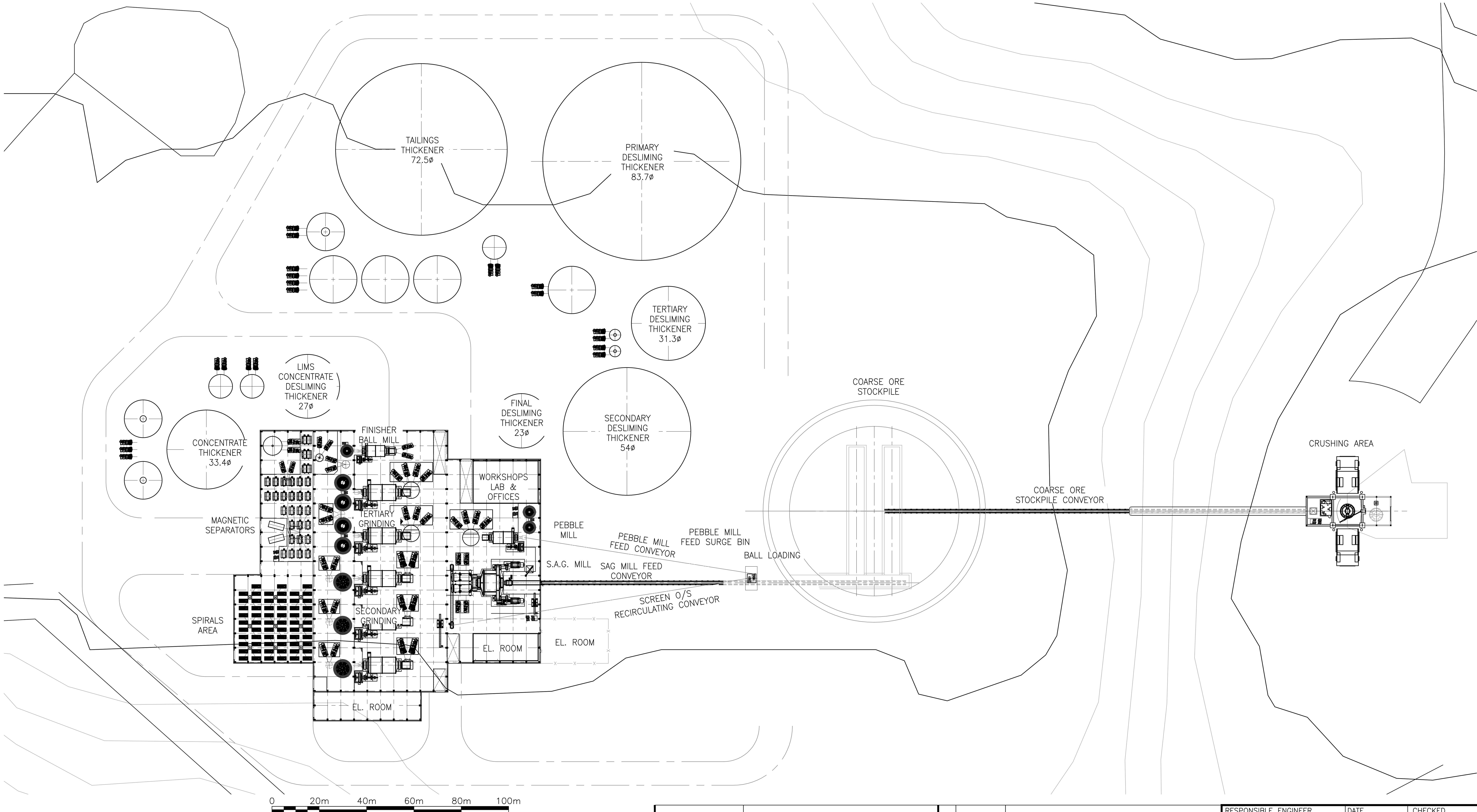

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NOT FOR CONSTRUCTION

PRELIMINARY

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

SURFACE FACILITIES LAYOUT

DRAWING NO	TITLE
REFERENCE DRAWINGS	

NO.	DATE/BY	TITLE / NAME
A	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA
REVISIONS		

	DATE		DATE
RESPONSIBLE ENGINEER CHARLES H. CAUCHON, ing.	2013/08/07	CHECKED CHARLES H. CAUCHON, ing.	2013/08/14
DESIGNED P. DESCHENEAUX	2013/08/05	APPROVED CHARLES H. CAUCHON, ing.	2013/08/14
DRAWN P. DESCHENEAUX	2013/08/07	SCALE AS NOTED	
CLIENT APPROVAL	YY/MM/DD	DEPARTMENT MECHANICAL	

DESSIN NO. A1-2013-023-0002-L REV. A

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PRELIMINARY

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

PRIMARY CRUSHING, STOCKPILE & RECLAIMING GENERAL LAYOUT

RESPONSIBLE ENGINEER: CHARLES H. CAUCHON, ing.	DATE: 2013/08/07	CHECKED: CHARLES H. CAUCHON, ing.	DATE: 2013/08/14
DESIGNED: P. DESCHENEAUX	DATE: 2013/08/05	APPROVED: CHARLES H. CAUCHON, ing.	DATE: 2013/08/14
DRAWN: P. DESCHENEAUX	DATE: 2013/08/07	SCALE: AS NOTED	
CLIENT APPROVAL	DATE: YY/MM/DD	DEPARTMENT: MECHANICAL	

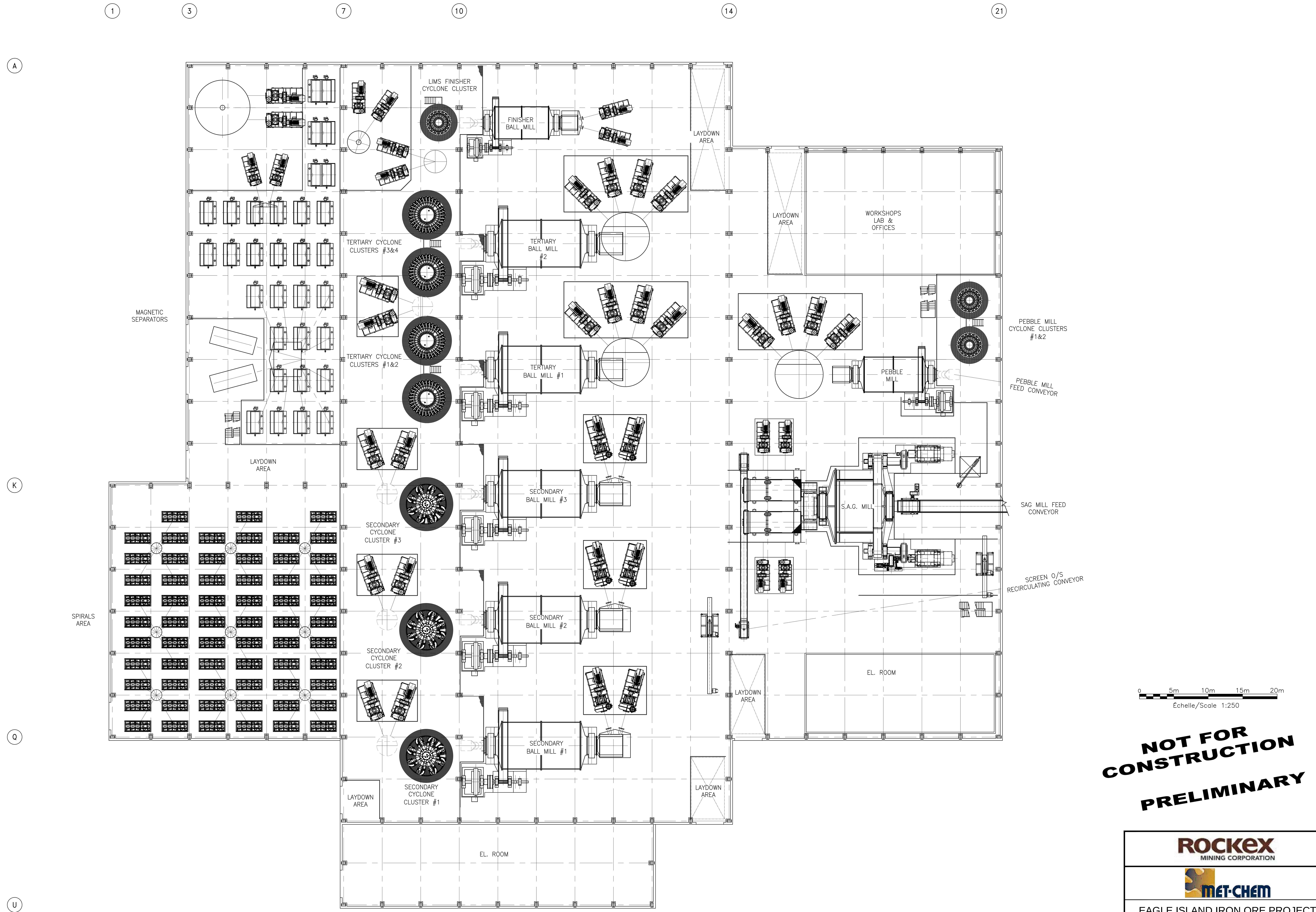
DESSIN NO. A1-2013-023-0003-L — REV. A

NO.	DATE/BY	TITLE / NAME
A	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS



NOT FOR CONSTRUCTION

PRELIMINARY

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

RESPONSIBLE ENGINEER CHARLES H. CAUCHON, ing.	DATE 2013/08/07	CHECKED CHARLES H. CAUCHON, ing.	DATE 2013/08/14	PRELIMINARY ECONOMIC ASSESSMENT
DESIGNED P. DESCHENEAUX	DATE 2013/08/05	APPROVED CHARLES H. CAUCHON, ing.	DATE 2013/08/14	PROCESS PLANT LAYOUT PLAN VIEW
DRAWN P. DESCHENEAUX	DATE 2013/08/07	SCALE AS NOTED		
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT MECHANICAL		DESSIN NO. A1-2013-023-0004-L REV. A

NO.	DATE/BY	TITLE / NAME
A	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

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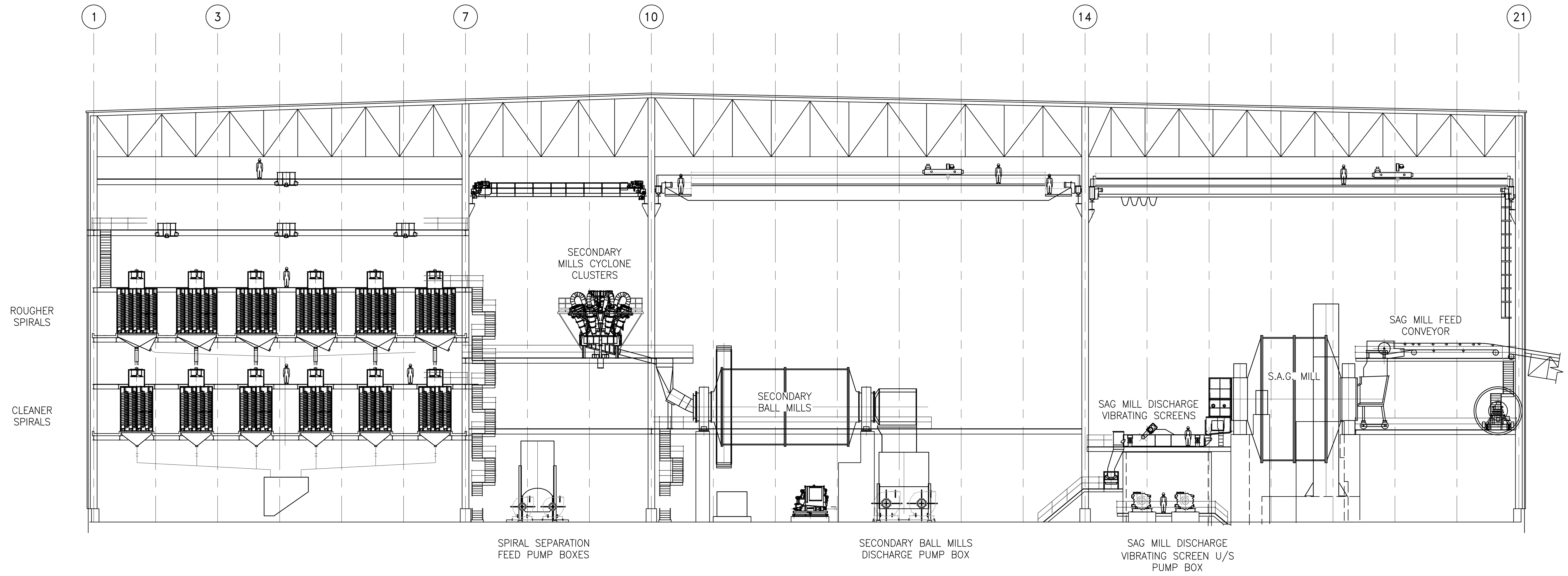

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PRELIMINARY

NOT FOR CONSTRUCTION

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

PROCESS PLANT
LAYOUT
SECTION

RESPONSIBLE ENGINEER	DATE	CHECKED	DATE
CHARLES H. CAUCHON, ing.	2013/08/07	CHARLES H. CAUCHON, ing.	2013/08/14
DESIGNED	DATE	APPROVED	DATE
P. DESCHENEAUX	2013/08/05	CHARLES H. CAUCHON, ing.	2013/08/14
DRAWN	DATE	SCALE	
P. DESCHENEAUX	2013/08/07	AS NOTED	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT	MECHANICAL

DESSIN NO. A1-2013-023-0005-L — REV. A

NO.	DATE/BY	TITLE / NAME
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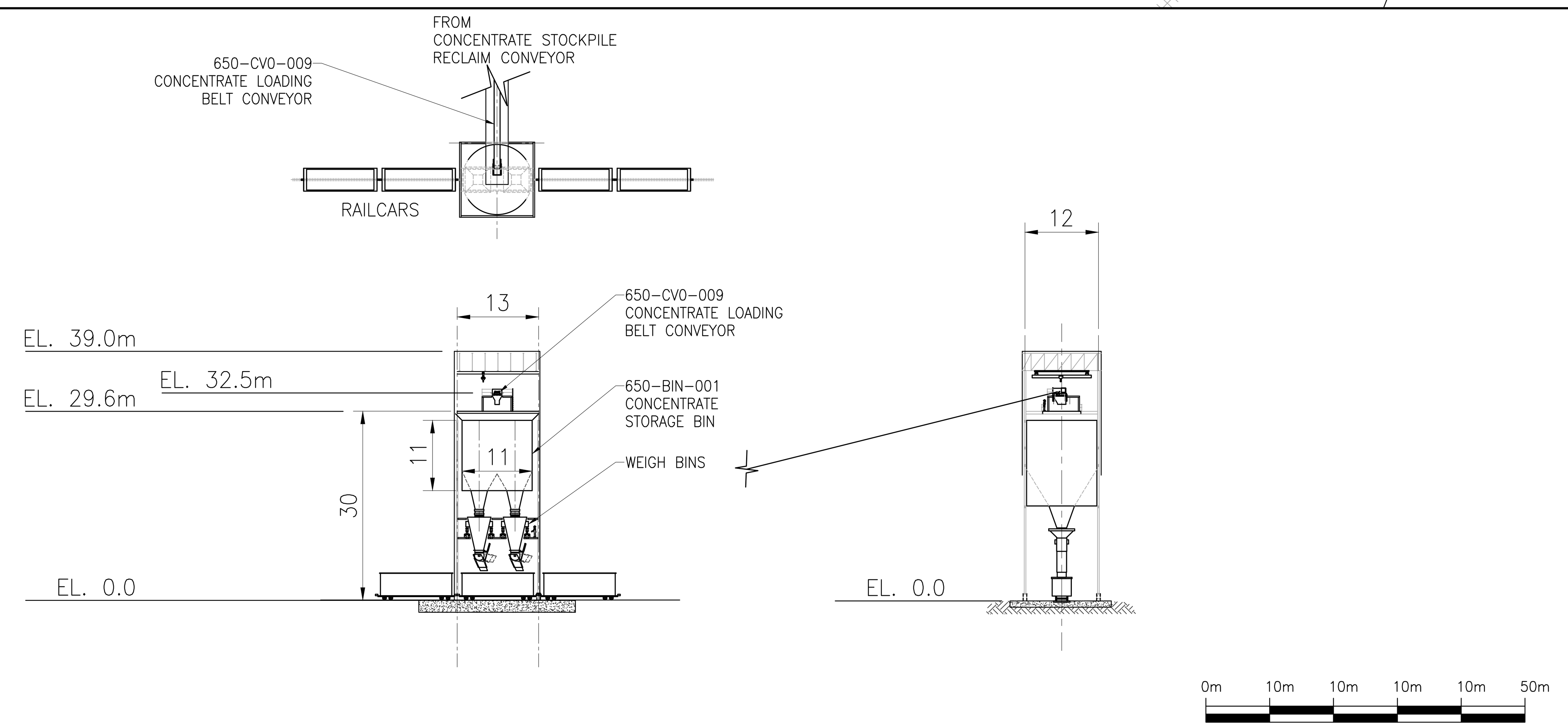
REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS



PRELIMINARY

DRAWING NO	TITLE	No.	DATE/PAR	DESCRIPTION	No.	DATE/PAR	DESCRIPTION
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REFERENCE DRAWINGS		REVISIONS			REVISIONS		

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 2013/07/15	CHECKED	DATE
DESIGNED WILLIAM SHADEED, ing.	DATE 2013/07/15	APPROVED	DATE
DRAWN D. VAN ZWYNDREGT	DATE 2013/07/15	SCALE	
CLIENT APPROVAL	DATE	DEPARTMENT MECHANICAL	

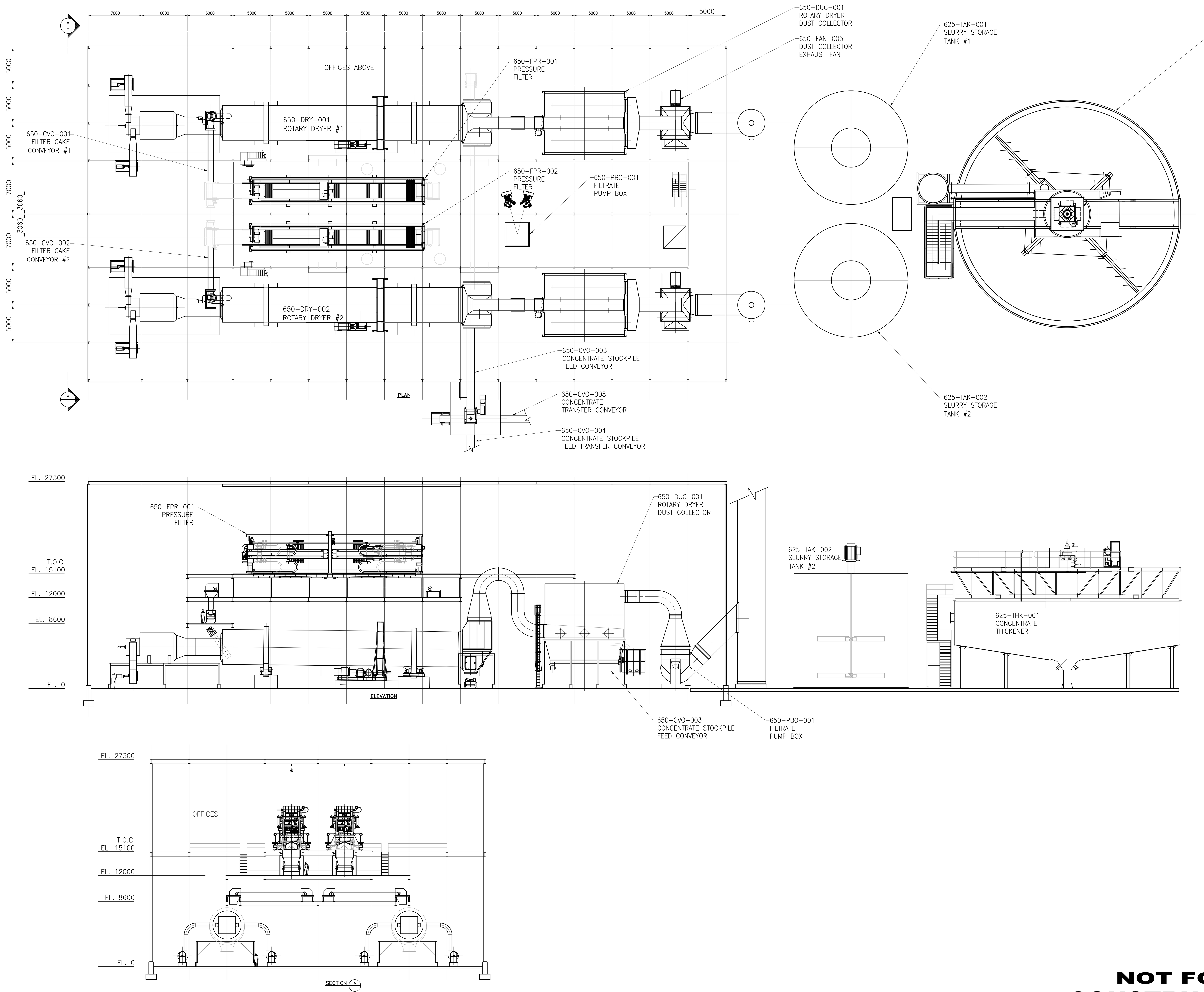
ROCKEX MINING CORPORATION

MET-CHEM

PRELIMINARY ECONOMIC ASSESSMENT

SIOUX LOOKOUT RAILCAR LOADING FACILITY
GENERAL ARRANGEMENT

DESSIN NO. A1-2013-023-0011-L — REV. A



PRELIMINARY

NOT FOR CONSTRUCTION

ROCKEX MINING CORPORATION

MET-CHEM

EAGLE ISLAND IRON ORE PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

SIOUX LOOKOUT CONCENTRATE FILTRATION
GENERAL ARRANGEMENT
PLAN AND SECTIONS

RESPONSIBLE ENGINEER	DATE YY/MM/DD	CHECKED	DATE YY/MM/DD
DESIGNED	DATE YY/MM/DD	APPROVED	DATE YY/MM/DD
DRAWN D. VAN ZWYNDREGT	DATE 2013/07/15	SCALE 1:200	
CLIENT APPROVAL	DATE YY/MM/DD	DEPARTMENT – ? –	

DESSIN NO. A1–2013–023–0012–L — REV. A

NO.	DATE/BY	TITLE / NAME
A	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA

REVISIONS

DRAWING NO	TITLE

REFERENCE DRAWINGS

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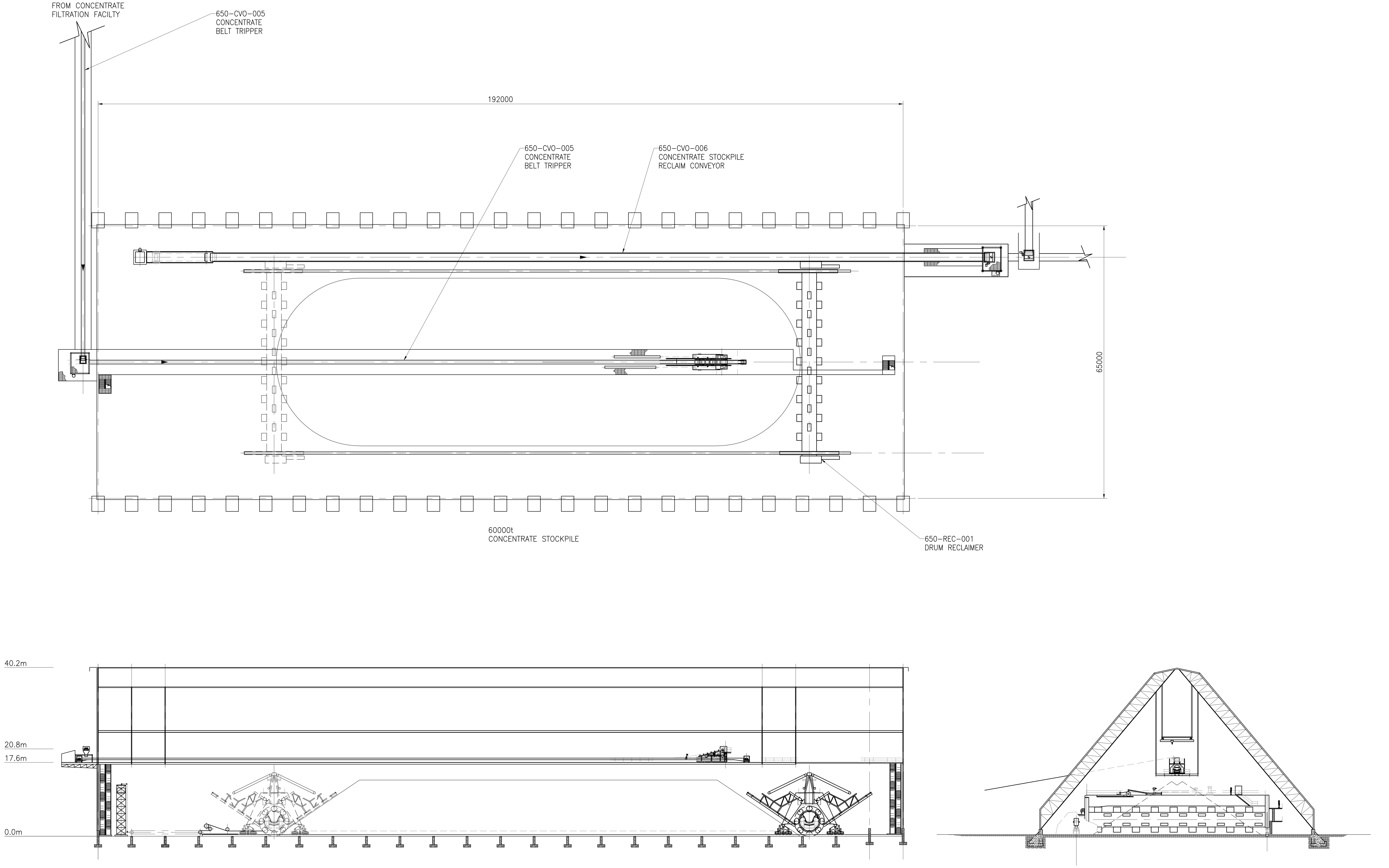

PRELIMINARY

REFERENCE DRAWINGS

DRAWING NO	TITLE

REVISIONS

No.	DATE/PAR	DESCRIPTION

REVISIONS

No.	DATE/PAR	DESCRIPTION
A	2013/08/14 CHARLES H. CAUCHON, ing.	ISSUED FOR PEA

RESPONSIBLE ENGINEER RYAN CUNNINGHAM, ing.	DATE 2013/07/15	CHECKED	DATE
DESIGNED WILLIAM SHADEED, ing.	DATE 2013/07/15	APPROVED	DATE
DRAWN D. VAN ZWYNDREGT	DATE 2013/07/16	SCALE 1:500	
CLIENT APPROVAL	DATE	DEPARTMENT MECHANICAL	

ROCKEX MINING CORPORATION

MET-CHEM

PRELIMINARY ECONOMIC ASSESSMENT
CONCENTRATE STOCKPILE AND LOADOUT

GENERAL ARRANGEMENT

DESSIN NO. A1-2013-023-0013-L

REV. A

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