

**Whitesand First Nation
Cogeneration and Pellet Mill Project**

Draft Project Description Report

Prepared By:

Neegan Burnside Ltd.
292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

Whitesand First Nation

June 2013

File No: 300030895

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Record of Revisions

Revision	Date	Description
0	June 18, 2013	Initial Submission to Ministry of the Environment and Ministry of Natural Resources

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Executive Summary

Whitesand First Nation is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility. The Project is located in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board (Armstrong Resource Development Corporation) and is located on the traditional territory of Whitesand First Nation.

The Project consists of the following main components:

- a Wood Processing Yard with material handling, processing, and storage components, as well as a mobile equipment garage / repair shop;
- a 4 MW Biomass Cogeneration Plant, which will generate electricity for the Project and the nearby community. It will also generate process steam and heat for use in the Pellet Plant and on-site buildings;
- a Pellet Plant, which will create approximately 60,000 metric tons per year of residential and/or industrial grade wood fuel pellets;
- wells to supply process water and domestic potable water for the facility;
- an on-site wastewater management system for facility process wastewater and domestic sewage; and
- a transformer substation to interface between the cogeneration plant and the local grid operated by Hydro One Remote Communities.

This Draft Project Description Report describes each component of the facility in detail, including Project activities during each stage of the Project. A list of potential negative environmental effects has also been developed, including planned studies and mitigation measures corresponding to the potential effects. These potential effects and mitigation strategies will evolve over the course of the Project as more information becomes available.

Neegan Burnside Ltd. will be conducting field surveys for the Natural Heritage Assessment and Water Assessment during July 2013. Following completion of the field studies, a complete draft set of Renewable Energy Approval reports are expected to be complete in November / December 2013. Public consultation will take place throughout the Project and will be thoroughly documented.

At this stage, an Application for Renewable Energy Approval is being prepared under O.Reg. 359/09 for the Project. The Ministry of Natural Resources (MNR) and Ministry of the Environment (MOE) will review this Draft Project Description Report and confirm comprehensive permitting requirements for the project.

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Appendices

- A Project Location
- B Equipment and Process Diagrams

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1.0 Introduction

1.1 Project Overview

Whitesand First Nation (“Whitesand”) is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility (the “Project”). The Project is located in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board (Armstrong Resource Development Corporation) and will be located solely on the traditional territory of Whitesand First Nation.

The general Project components include a biomass fueled electric power and heat cogeneration plant, a wood pellet plant, garage, material storage and handling areas, a wastewater management system, and transformer substation. The only biomass used to fuel the cogeneration plant will be woodwaste, making it a Class 1 Thermal Facility under Ontario Regulation 359/09 of the *Environmental Protection Act* (O.Reg. 359/09). The proposed Class 1 Thermal Facility would have a nameplate capacity of 4 MW, and would displace the energy supply from existing diesel generators servicing the community via a local grid, operated by Hydro One Remote Communities Inc., as well as supply electricity for the Project. The local grid is not connected to the Provincial grid, and there are no such future plans for a transmission connection.

An Application for Renewable Energy Approval is being prepared under O.Reg. 359/09 for the Project. The Ministry of Natural Resources (MNR) and Ministry of the Environment (MOE) will review this Draft Project Description Report and confirm comprehensive permitting requirements for the Project.

1.2 Report Requirements

The Project Description Report serves as the central document for the Project, and will be updated as the Project progresses. At this stage, the draft report is being submitted to initiate consultation and define permitting requirements. The Project Description Report is required to satisfy the requirements listed in **Table 1.1**, as defined by O.Reg. 359/09. This report was also prepared according to guidance from the Technical Guide to Renewable Energy Approvals (MOE, 2011).

Table 1.1 Report Requirements

Item	Requirement Met?	Reference in This Report
Set out a description of the following in respect of the renewable energy project:		
1. Any energy sources to be used to generate electricity at the renewable energy generation facility.	Yes	Section 2.3
2. The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.	Yes	Section 3.1
3. If applicable, the class of the renewable energy generation facility.	Yes	Section 2.3
4. The activities that will be engaged in as part of the renewable energy project.	Yes	Section 3.2
5. The name plate capacity of the renewable energy generation facility.	Yes	Section 2.3
6. The ownership of the land on which the project location is to be situated.	Yes	Section 3.4
7. If the person proposing to engage in the project does not own the land on which the project location is to be situated, a description of the permissions that are required to access the land and whether they have been obtained.	Yes	Section 3.4
8. Any negative environmental effects that may result from engaging in the project.	Yes	Section 4.0
9. If the project is in respect of a Class 2 wind facility and it is determined that the project location is not on a property described in Column 1 of the Table to section 19, a summary of the matters addressed in making the determination.	N/A	N/A

Item	Requirement Met?	Reference in This Report
10. If the project is in respect of a Class 2 wind facility in respect of which section 20 applies and it is determined that the project location does not meet one of the descriptions set out in subsection 20 (2) or that the project location is not in an area described in subsection 20 (3), a summary of the matters addressed in making the determination.	N/A	N/A
11. An unbound, well marked, legible and reproducible map that is an appropriate size to fit on a 215 mm by 280 mm page, showing the project location and the land within 300 m of the project location.	Yes	Appendix A

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2.0 General Information

2.1 Name of the Project and Applicant

The name of the Project and Applicant are provided in **Table 2.1**.

Table 2.1 Name of Project and Applicant

Name of Project	Whitesand First Nation Cogeneration and Pellet Mill Project
Name of Applicant	Whitesand First Nation as Agent

The Project is also referred to as the Community Sustainability Initiative (CSI).

2.2 Project Location

The Project is located on Crown land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario; approximately 210 km north of Thunder Bay, and 2 km south of Armstrong. The Project will be located on the traditional territory of Whitesand First Nation. This Project context is shown in the key map of **Figure A1 of Appendix A**.

The “project location” is defined in O. Reg. 359/09 as:

“a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project”.

The Project location also includes any temporary work areas required to construct the Project. The cogeneration plant, garage, pellet plant, wastewater management system, and associated equipment and temporary work areas are anticipated to be contained within a boundary of approximately 42 hectares as shown in **Figures A1 and A2 of Appendix A**. As Project design progresses, it is expected that this site boundary will be revised to a smaller area within this boundary. For reference, a preliminary site plan of the Project is shown within the Project location in **Figures A1 and A2 of Appendix A**.

There is an existing electricity distribution connection owned and operated by Hydro One Remote Communities Inc. that will be used to connect the Project to the local grid. It is within an existing right-of-way extending from the site to the nearby existing diesel generating station. Any upgrades required to the existing electricity distribution connection will be the responsibility of Hydro One Remote Communities Inc.

Solid waste generated at the facility will be disposed of at the existing local landfill, operated by the Ministry of Natural Resources.

2.3 Energy Source, Nameplate Capacity, and Class of Facility

The only biomass used to fuel the cogeneration plant will be woodwaste, making it a Class 1 Thermal Facility under O.Reg. 359/09. It will have a nameplate capacity of 4 MW, which will be used to power the pellet plant and future local commercial development (approximately 3.2 – 3.75 MW), as well as provide electricity for the entire demand of the local community (approximately 0.25 – 0.8 MW). The Project will not be located at a farm operation.

The average daily and annual quantities of biomass material requirements for the project are provided in **Table 2.2** below. The required annual biomass quantities have been allocated by the Ministry of Northern Development, Mines and Forestry for Use by this Project.

Table 2.2 Biomass Material Requirements

Project Component	Estimated Biomass Requirements	
	Average Daily Quantity	Average Annual Quantity
Cogeneration Plant	137 m ³ / day	48,000 m ³ / year
Pellet Plant	310 m ³ / day	113,000 m ³ / year

The cogeneration plant will be equipped with a backup / emergency diesel generator, which will only be used during cogeneration plant start-up and maintenance. The electricity generated during these start-up and maintenance processes will supply less than 1% of the electricity generated by the Project on an annual basis.

There are other components of the Project that are not considered a renewable energy generation facility under O.Reg. 359/09. These components are described in Section 3.0.

2.4 Contact Information

General contact information for the Project is as follows:

Website: www.whitesandfirstnation.com
E-mail: whitesandbiomass@neeganburnside.com
Phone & Fax: 1-800-935-0832

Applicant

The Project Applicant is Whitesand First Nation.

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The principal contact for the Applicant is:

Name: Craig Toset, Project Manager
Company: Whitesand First Nation
Address: PO Box 68, Armstrong, Ontario, P0T 1A0

E-mail: ctoset@tbaytel.net
Telephone: 807-583-2177
Fax: 807-583-2170

Consultant

Neegan Burnside Ltd. was retained by Whitesand First Nation as the environmental permitting consultant. Neegan Burnside Ltd. is a majority owned Aboriginal firm providing engineering and environmental consulting services.

The principal Project consultant representing the Applicant is:

Name: Chris Shilton, Project Manager
Company: Neegan Burnside Ltd.
Address: 292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
E-mail: chris.shilton@neeganburnside.com
Telephone: 519-823-4995
Fax: 519-836-5477

2.5 Other Approvals Required

The Project is located on Crown land on which a portion of it has been withdrawn under Section 35 of the Mining Act for prospecting, staking out, sale or lease rights, to develop a cogeneration processing facility. The land was previously used as an industrial site for a forestry operation under a Land Use Permit which was forfeited to the Crown. This area is shown in **Figure A2** of **Appendix A**. Whitesand currently holds the Land Use Permit for the existing industrial site and is in the process of extending the Land Use Permit for the full extent of the Project location.

As shown in **Figure A2**, there is an existing electricity distribution connection that connects the site to the existing diesel generating station. Any upgrades or modifications that may be required for the existing electricity distribution connection will be the responsibility of Hydro One Remote Communities Inc.

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The Project includes certain components (ie. the Class 1 Thermal cogeneration plant and transformer substation) that are considered a renewable energy generation facility under O.Reg. 359/09, and other components (ie. the pellet plant) that would not typically be considered part of the renewable energy generation facility. However, each Project component is integrated into a facility that will be operated on the same site. As such, MNR and MOE will review this Draft Project Description Report and confirm comprehensive permitting requirements for the project.

2.6 Federal Involvement

At this stage, there is no federal involvement anticipated, including permitting under the 2012 Canadian Environmental Assessment Act (CEAA).

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3.0 Project Information

3.1 Facility Components

The Project includes a variety of components with the overall objective to generate electricity and create premium grade wood pellets. A general description of each component of the Project is described below. Detailed diagrams of the various processes at the facility, including the required equipment for each process, are provided in **Appendix B**. The process descriptions and equipment described in the following sections are preliminary and subject to change as detailed design progresses.

3.1.1 Wood Processing Yard

The Project components relating to the yard can generally be characterized as the outdoor features that will be used for material transport; raw processing; and storage. A portion of the yard will be hard surfaced (ie. asphalt or concrete) to facilitate material handling and storage. The round wood will be stored in an unpaved open yard. The site will be equipped with appropriate fire, safety, security, and communications equipment. Detailed diagrams of the processes and equipment in the yard are provided in **Appendix B**, and the site plan is shown in **Figure A1 of Appendix A**.

Near the entrance of the site, there will be a truck scale to weigh transported materials, which will be delivered to the site in the form of hogged fuel, or round wood. The round wood and hogged materials will be stored outside without cover. Round wood will be processed in the yard by a chipper / debarker system, which will remove the bark and process the wood to a standard chip size. These processed chips will be in an outside, uncovered paved storage pad, while bark and waste from the on-site chipping operation will be added to the outside paved storage area with the hogged materials. The hogged and waste materials will be used as fuel for the cogeneration plant.

There will be a mechanical conveyor system with diversion screens and a metal detector / magnet to facilitate material storage and transport throughout the facility. The conveyor system will service each material storage pile, which will be used as feedstock in the cogeneration and pellet plant processes. The conveyor system will be supplemented by a truck trailer tipper, mobile bucket loader, log loader, log trailer, and log feeder.

The yard will also host a mobile equipment garage / repair shop, having a footprint of approximately 225 m² (2,422 ft²). The garage will have proper storage facilities for any oils, lubricants, or hazardous chemicals to be used and stored in the building.

For all Project buildings, any hazardous material will be stored in appropriate, labeled containers, with Material Safety Data Sheets in each building where the hazardous material will be used or stored.

3.1.2 Biomass Cogeneration Plant

The biomass cogeneration plant is considered a Class 1 Thermal Facility under O.Reg. 359/09. It will have a nominal capacity of 4 MW, which will be used to power the pellet plant (approximately 2.4 – 2.6 MW), as well as provide electricity for the entire demand of the local community (approximately 0.5 MW). Biomass quantities required for the cogeneration plant are estimated to be 48,000m³ / yr, or 137 m³ / day. Approximately 10,500 m³ / year will be supplied for the pelleting debarker operation, with the remaining 37,500 m³ / year to be wood fuel procured from local forestry operations or suppliers.

There are a number of technologies available to generate electricity from biomass. At this stage, the Project is proceeding on the basis of using the steam Rankine cycle. This process is a closed thermal cycle, where the biomass fuel combustion process and the power generation cycle are physically separated. This process isolates and protects the power generator from potential contamination in the biomass fuel combustion process.

The steam Rankine cycle can generally be described in the following three steps:

1. biomass is combusted with excess oxygen in a boiler to produce steam;
2. steam is used to drive a steam turbine, connected to an electrical generator, creating electricity;
3. steam is condensed and pumped for re-use in the boiler to repeat the cycle.

The cogeneration component of the plant comes from the steam turbine exhaust, where the steam at a lower pressure and temperature is used in the pellet plant biomass dryer system, and for heat in the on-site buildings.

The total footprint of the cogeneration plant, including the biomass dryer building, heat source building, and turbine building, is expected to be approximately 1,300 m² (14,000 ft²).

Preliminary detailed diagrams of the proposed processes and equipment at the cogeneration facility are provided in **Appendix B**. Generally, the equipment required for the cogeneration plant includes:

- a biomass belt dryer;

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- moisture metering equipment;
- a de-aerator system and water tank for process water supply;
- a biomass furnace and boiler to generate steam;
- a steam turbine;
- an electrical generator;
- a condenser and cooling tower;
- water and steam distribution piping;
- a fire suppression system;
- a heating and ventilation system, including exhaust stacks;
- pumps and fans;
- an emission monitoring system;
- an ash collection and storage system;
- a mechanical material handling system;
- partitioned rooms (ie. offices, lunch room, mechanical/electrical room); and
- fuel tanks and a backup / emergency generator.

3.1.3 Pellet Plant

The pellet plant will utilize heat and electricity from the cogeneration plant to create approximately 8 metric tons per hour or 60,000 metric tons per year of residential and/or industrial grade fuel pellets. Biomass quantities required for the pellet plant are estimated to be 113,000 m³ / yr, or 310 m³ / day.

Dried biomass from the cogeneration plant will be used as feedstock for the pellet plant. The dried biomass will be transferred to the hammer mill via the mechanical conveyor system and feed bucket elevator. In the hammer mill, the biomass will be ground into a fine material, and then transferred to a ripening bin with moisture metering equipment. The pellet mill will then use process steam from the cogeneration plant to compress the ground material under high temperature and pressure conditions into wood pellets. The wood pellets are then cooled, screened, and stored in a pellet storage bin prior to packaging on site for shipping.

The total footprint of the pellet plant is expected to be approximately 975 m² (10,500 ft²).

Detailed diagrams of the processes and equipment at the pellet plant are provided in **Appendix B**. Generally, the equipment required for the pellet plant includes:

- a mechanical material handling system, including feed bucket elevators;
- dry biomass and pellet storage bins / silos;
- hammer mills;
- a pellet ripening bin;

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- moisture metering equipment;
- pellet mills;
- a pellet cooler;
- dust control bag houses;
- partitioned rooms (ie. control room, offices, lunch room, mechanical/electrical room);
and
- a pellet packaging and bag stacking system.

3.1.4 Water Supply and Storage

According to preliminary studies, facility process water and potable domestic water is expected to be supplied via on-site wells. Water supply for firefighting is also expected to be supplied via on-site wells. Firewater storage to meet the required demand will be inside the heated portion of the building(s). Although the current design is for internal storage, this could be supplemented by an on-site pond. If a pond is chosen, it is expected to have a small footprint with a deep bottom to reduce the volume of inaccessible frozen water during the winter.

The general components of the water supply and storage system include:

- wells (primary and back-up);
- pumps;
- a potable water treatment system;
- monitoring equipment;
- storage tanks (if required); and
- a pond (if required).

3.1.5 Wastewater Management

Onsite wastewater systems will be designed to manage wastewater generated from the Project. Two separate systems will be designed: one to manage facility process wastewater and a second for domestic sewage.

The general components of the wastewater systems will include:

- plumbing from the facility plants and buildings to the wastewater systems;
- a subsurface septic tank;
- a subsurface effluent disposal bed; and
- monitoring equipment and alarms as required.

3.1.6 Transformer Substation

A main transformer substation will be constructed near the entrance of the site to step up the voltage of the electricity produced by the cogeneration plant from 5 kV to 25 kV. This is required to match the voltage of the electricity distribution line operated by Hydro One Remote Communities. The substation will include protection, control, monitoring, and communications equipment (including line reactor and load bank) to protect on-site equipment and ensure that the electricity being distributed to Hydro One Remote Communities is compliant with the specified operating conditions. It will also include security and safety equipment, including proper electrical grounding and a fence. The footprint of the transformer substation is expected to be approximately 350 m² (3,770 ft²).

In addition to the main transformer substation, there will also be three outdoor pad-mounted transformers servicing the cogeneration and pellet plants. These transformers would step down the voltage used by the buildings from 5 kV to 600 V for distribution to the plant loads.

There is an existing electricity distribution connection owned and operated by Hydro One Remote Communities Inc. that will be used to connect the Project to the local grid. It is within an existing right-of-way extending from the site to the nearby existing diesel generating station. The connection point will be at a hydro pole near the Project's main transformer substation at the entrance of the site. The hydro pole will be equipped with a gang operated fused disconnect switch as required by the Electrical Safety Authority and Hydro One. Furthermore, Hydro One will monitor the voltage, power factor and frequency of electricity generated by the cogeneration plant, and will remote trip the cogeneration plant in the event that it is operating outside of its specified parameters. The existing diesel generators would then be used as an emergency backup source of power for the community until the problem is resolved at the cogeneration plant. Any upgrades required to the existing electricity distribution connection will be the responsibility of Hydro One Remote Communities Inc.

3.2 Project Activities

3.2.1 Project Schedule

The anticipated Project schedule is presented in **Table 3.1** below.

Table 3.1 Project Schedule

Project Activity	Anticipated Schedule
Issue First Draft Project Description Report	June 2013
REA Technical Studies	2013 through 2014

Public Information Centre #1	July / August 2013
Issue Draft REA Reports to the Public	December 2013
Public Information Centre #2	February 2014
REA Submission / Approval	March / July 2014
Start of Construction	Summer / Fall 2014
Project Operation	2015 – 2040
Decommissioning	2041

3.2.2 Operating Schedule

The Project operating schedule is presented in **Table 3.2** below.

Table 3.2 Operating Schedule

Project Component	Seasonal & Weekly Operation	Daily Operation
Cogeneration Plant	All year, 7 days / week	24 hours / day
Pellet Plant	All year, 7 days / week	24 hours / day
Wood Processing Yard	All year, 7 days / week	12 hours / day

3.2.3 Project Activities

Once permitting is complete, Project activities can be organized into three phases as follows:

- Construction
- Operation / Maintenance
- Decommissioning

Specific Project activities during each of the phases above are outlined in **Table 3.3** below.

Table 3.3 Project Activities by Phase

Phase	Project Activities
Construction	<p>Wood Processing Yard:</p> <ul style="list-style-type: none"> • Survey for layout and delineation of work areas; • site clean-up, clearing and grading; • delivery of construction and Project equipment to site; • construction of the garage / repair shop, including foundations; • construction of the mechanical conveyor system; • asphalt and/or concrete paving; • installation of safety, security, and fire protection equipment; • restoration of all temporarily disturbed areas upon completion of Project construction.

Phase	Project Activities
	<p>Cogeneration Plant:</p> <ul style="list-style-type: none"> • Construction of the cogeneration plant buildings (ie. heat source, turbine, and dryer buildings), including foundations; • construction of the water and wastewater plumbing with protected leads extending outside the building footprint; • installation of equipment for use in cogeneration plant; • connection with the yard mechanical conveyor system; and • installation of pad-mounted transformers and associated electrical equipment.
	<p>Pellet Plant:</p> <ul style="list-style-type: none"> • Construction of the Pellet Plant building, including foundations; • construction of the water and wastewater plumbing with protected leads extending outside the building footprint; • installation of equipment for use in pellet plant; • construction of the storage bins / silos; • connection with the yard mechanical conveyor system; and • installation of the pad-mounted transformer and associated electrical equipment.
	<p>Water Supply and Storage:</p> <ul style="list-style-type: none"> • Well drilling and screen installation (pre-construction); • aquifer testing (pre-construction); • connection of wells to on-site buildings; • installation of storage tanks in building(s) for firewater demand; and • construction of a pond for firewater demand (if required)
	<p>Wastewater Management:</p> <ul style="list-style-type: none"> • Connect sewage pipes to building wastewater service leads; • excavate and place underground tankage; • excavate disposal bed area and install perforated pipe and stone for effluent distribution; and • install and connect system controls and alarms as required
	<p>Substation:</p> <ul style="list-style-type: none"> • Excavate and install electrical grounding and granular foundation; • install electrical equipment at the substation; and • install safety, security, and communications equipment.

Phase	Project Activities
Operation and Maintenance	<p>Wood Processing Yard:</p> <ul style="list-style-type: none"> • Material transport via trucks to on-site weighing, sorting, storing, and shipping from site; • operation of mobile equipment for material sorting and storage; • round wood debarking and chipping; • material transport via a mechanical conveyor system; and • mobile equipment maintenance at the garage / repair shop, including proper use, storage, and disposal of oils, lubricants and any other hazardous material
	<p>Cogeneration Plant:</p> <ul style="list-style-type: none"> • Pumping supply water; • material transport via a mechanical conveyor system; • combustion of biomass; • creation of steam through use of a boiler; • electricity generation from a steam turbine and generator; • cooling and condensing re-usable process steam; • drying of biomass; • operation of fans and exhaust venting; • collection and storage of solid waste (ash) prior to transportation to the local landfill operated by MNR; • operation of emergency backup generator during cogeneration plant maintenance (estimated 1-3 day maintenance period per year).
	<p>Pellet Plant:</p> <ul style="list-style-type: none"> • Pulverizing biomass through the use of a hammer mill; • creating wood pellets using process steam and a pellet mill; and • packaging wood pellets for shipping
	<p>Water Supply and Storage:</p> <ul style="list-style-type: none"> • Water pumping in accordance with a Permit To Take Water (greater than 50,000 L / day); • water quality testing in compliance with MOE regulations; • well testing and maintenance as required; and • hydrogeological monitoring if required by the Permit To Take Water
	<p>Wastewater Management:</p> <ul style="list-style-type: none"> • Monitor system controls and alarms as required; and • remove accumulated sludge and scum from tanks as required

Phase	Project Activities
	Transformer Substation: <ul style="list-style-type: none"> • Operation and monitoring of electrical equipment; • electrical equipment maintenance and transformer oil replacement; and • automatic process shut down when facility is operating outside its specified parameters.
Decommissioning	Wood Processing Yard: <ul style="list-style-type: none"> • Sale or refurbishment of the yard in-place or removal of all equipment; • demolition and removal of the garage / repair shop; • removal of all asphalt and concrete; • removal of all garbage and waste after decommissioning of all Project components; and • restoration of affected land to its original state as required. Cogeneration Plant: <ul style="list-style-type: none"> • Sale or refurbishment of the cogeneration plant in-place, or demolition and removal / salvage as required. Pellet Plant: <ul style="list-style-type: none"> • Sale or refurbishment of the pellet plant in-place, or demolition and removal / salvage as required. Water Supply and Storage: <ul style="list-style-type: none"> • Wells will be sold for future use or decommissioned and abandoned per O. Reg 903; Wastewater Management: <ul style="list-style-type: none"> • Sale of subsurface tanks in-place, or removal; and • sale of disposal beds in place, or disconnection and abandonment. Transformer Substation: <ul style="list-style-type: none"> • Sale or refurbishment of the transformer substation in-place, or demolition and removal / salvage as required.

3.3 Map of Project Location

An unbound map of the Project location is provided as **Figure A2 of Appendix A**. For specific details and definition of the Project location, refer to Section 2.2.

3.4 Land Ownership

As noted in Section 2.5, the Project is located on Crown land on which a portion of it has been withdrawn under Section 35 of the Mining Act for prospecting, staking out, sale or

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lease rights, to develop a cogeneration processing facility. This area is shown in **Figure A2 of Appendix A**. A portion of the site was previously used as an industrial site for a forestry operation under a Land Use Permit which was forfeited to the Crown. Whitesand currently holds the Land Use Permit for the original industrial site and is in the process of obtaining a Land Use Permit for the full extent of the Project location.

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4.0 Potential Negative Environmental Effects

Potential negative effects associated with the Project are identified in **Table 4.1** below. As the REA process progresses, each potential effect will be studied in greater detail to identify the significance, magnitude and duration of each effect. Mitigation will be developed to minimize effects to the extent possible. Finally, a post-construction monitoring program will be developed to identify and address any unexpected impacts that may result from the project.

A key component of the REA process is the establishment of common setbacks for all renewable energy facilities in the Province. The Project will be designed to meet the setbacks outlined in O. Reg. 359/09 to the extent possible. Within the regulation there are some setbacks for which studies that identify potential negative environmental effects and mitigation measures can be conducted in lieu of meeting the setback requirements. In some instances in the proposed design, Project components may be proposed within the defined setbacks. In these instances, additional assessments will be conducted as required.

Potential negative effects, proposed mitigation measures and additional studies currently underway or proposed in the near future have been summarized in **Table 4.1**.

Table 4.1 Potential Project Effects, Mitigation, Additional Studies

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
Heritage / Archaeology	<ul style="list-style-type: none"> • Disturbance to archaeological and cultural heritage resources during construction. 	<ul style="list-style-type: none"> • A Stage 1 Archaeological Assessment and consultation with agencies regarding Heritage Resources will be initiated shortly. • Additional Archaeological and Cultural Assessments will be undertaken (by a licensed archaeologist) if it is determined that there is potential for resources to be present. • Appropriate clearance will be obtained by the Ministry of Tourism and Culture. • Consultation will be undertaken with relevant First Nations and Métis communities. • Should any unknown/unexpected

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
		artifacts or human remains be encountered during construction the construction contractor will stop work and the Ministry of Culture will be notified.
Woodlands and Natural Vegetation	<ul style="list-style-type: none"> • Fragmentation. • Introduction of invasive species. • Vegetation loss/change during construction. • Removal of biomass from surrounding forests for use in the various facility processes. 	<ul style="list-style-type: none"> • Field studies will commence in the summer of 2013 to confirm the presence, significance, sensitivity and abundance of woodlands and natural vegetation, including: <ul style="list-style-type: none"> – Vegetation inventories; – Ecological Land Classification; and, – Species at Risk surveys as required. • An attempt will be made to create a site plan that meets all applicable natural heritage setbacks as outlined in O. Reg. 359/09. If setbacks cannot be met, an Environmental Impact Study will be completed to identify potential impacts and recommend mitigation measures to minimize impacts. • If required, a permit or permits under the <i>Ontario Endangered Species Act</i> will be obtained. • Appropriate clearances will be obtained from the MNR. • Only approved and permitted biomass will be used in the cogen and pellet plant. • Consultation will be undertaken with relevant First Nations and Métis communities.

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
Wetlands	<ul style="list-style-type: none"> • Fragmentation. • Introduction of invasive species. • Vegetation loss/change • Possible loss of, or disturbance to, Provincially Significant Wetlands, non-Provincially Significant Wetlands and unevaluated wetlands. • Impacts to the hydrological regime due to changes in surface water runoff and groundwater drawdown. 	<ul style="list-style-type: none"> • Field studies will commence in the summer of 2013 to confirm the presence and potential significance of wetlands. • An attempt will be made to create a site plan that meets all applicable natural heritage setbacks as outlined in O. Reg. 359/09. If setbacks cannot be met, an Environmental Impact Study will be completed to identify potential impacts and recommend mitigation measures to minimize impacts. • Appropriate clearances will be obtained from the MNR. • Mitigation measures will be developed to ensure that above and below ground water flow to wetlands is not altered as a result of the project. • Consultation will be undertaken with relevant First Nations and Métis communities.
Life Science and Earth Science Areas of Natural and Scientific Interest (“ANSIs”)	<ul style="list-style-type: none"> • These features are not present within 120 m of the Project Location. No effects are anticipated. 	<ul style="list-style-type: none"> • No mitigation is currently proposed. • If the Project Location changes, effects on these features will be reviewed and mitigation developed, as required.
Terrestrial Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> • Disruption to terrestrial species and their breeding, feeding and migration habitats, including: <ul style="list-style-type: none"> – birds; – bats; – mammals; 	<ul style="list-style-type: none"> • Field studies will commence in the summer of 2013 to confirm the presence, significance, sensitivity and abundance of wildlife and wildlife habitat, in accordance with the Natural Heritage Assessment Guide for Renewable Energy Projects

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
	<ul style="list-style-type: none"> – amphibians; – reptiles; – insects; and, – species at risk. 	<p>(MNR, 2011).</p> <ul style="list-style-type: none"> • An attempt will be made to create a site plan that meets all applicable natural heritage setbacks as outlined in O. Reg. 359/09. If setbacks cannot be met, an Environmental Impact Study will be completed to identify potential impacts and recommend mitigation measures to minimize impacts. • If required, a permit or permits under the <i>Ontario Endangered Species Act</i> will be obtained. • Appropriate clearances will be obtained from the MNR. • Consultation will be undertaken with relevant First Nations and Métis communities.
Provincial Parks, Conservation Reserves or Valleylands	<ul style="list-style-type: none"> • These features are not present within 120 m of the Project Location. No effects are anticipated. 	<ul style="list-style-type: none"> • No mitigation is currently proposed. • If the Project Location changes, effects on these features will be reviewed and mitigation developed, as required.
Surface Water	<ul style="list-style-type: none"> • Erosion during construction could affect water quality due to increased sediment load. • Water quality impacts due to leachate or movement of biomass and bio-waste into nearby water bodies. • Water quality impacts due to potential fuel and oil spills. 	<ul style="list-style-type: none"> • Work will commence in the summer of 2013 to characterize watercourses in the Project Area. • Mitigation measures will be developed to ensure that biological material is contained on the site and there will be no leaching or contaminated surface runoff into nearby water bodies. • Mitigation measures will be developed to minimize potential impacts associated with erosion and spills.

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
		<ul style="list-style-type: none"> – Erosion and sediment control measures would be implemented during all construction activities. – Measures would be inspected regularly. – Materials removed or stockpiled would be contained in a manner to ensure sediment does not enter a watercourse. – All spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels would be reported to the MOE's Spills Action Centre.
Groundwater	<ul style="list-style-type: none"> • Groundwater taking for use by the Project (expected to require more than 50,000 L / day) • Impacts to groundwater quality from onsite wastewater treatment. • Potential to encounter non-documented shallow dug wells. • Water quality impacts due to leachate from biological material to groundwater. • Water quality impacts due to potential fuel and oil spills. 	<ul style="list-style-type: none"> • Work is ongoing to characterize groundwater in the Project Area and identify any wells which could potentially be affected. • A Permit to Take Water will be obtained from the MOE, as required for groundwater takings. Above 50,000 L / day • The wastewater management system will be designed and located to safely infiltrate Project wastewater while protecting groundwater conditions. • Mitigation measures will be developed to minimize potential impacts associated with dewatering and spills. • Water quality testing will take place during project operations

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
		as required by MOE regulations <ul style="list-style-type: none"> • Hydrogeological monitoring will take place if required by the Permit To Take Water.
Aquatic Species and Aquatic Habitat	<ul style="list-style-type: none"> • Potential impacts to fish habitat due to spills and leachate reaching nearby lakes. • Lakes may also be affected by groundwater taking. 	<ul style="list-style-type: none"> • Work will commence in the summer of 2013 to characterize lakes in the Project Area. • Detailed fish habitat assessments will be undertaken in areas where project components are located in proximity to lakes. • Mitigation measures will be developed to minimize potential impacts associated with erosion, spills and water taking.
Air, Odour, Dust	<ul style="list-style-type: none"> • Dust and air emissions from the cogen plant and pelleting processes. • Increases in air-borne dust and particulate matter, increased emissions from construction vehicles during construction and decommissioning. • Positive effects of reducing air emissions from diesel electrical energy generation. 	<ul style="list-style-type: none"> • An Approval will be obtained from the MOE for all air, odour and dust emissions. • The Contractor would implement good site practices with regard to air/odour which may include: <ul style="list-style-type: none"> – Multi-passenger vehicles would be utilized to the extent practical; – Company and contractor personnel would avoid idling of vehicles when not necessary for construction activities; – Equipment and vehicles would be turned off when not in use unless required for activities and/or effective operation of the equipment or vehicle; – Equipment and vehicles would be maintained in good working order with functioning mufflers and emission control

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
		<p>systems as available;</p> <ul style="list-style-type: none"> – All vehicles would be fitted with catalytic converters as required; <ul style="list-style-type: none"> • The Contractor would implement good site practices with regard to dust which may include: <ul style="list-style-type: none"> – Protecting stockpiles of friable material with a barrier; – Dust suppression (e.g. water) of source areas; – Covering loads of friable materials during transport.
Noise	<ul style="list-style-type: none"> • Noise effects from the operation of construction machinery and transport of materials into the project area; • Noise Emissions from equipment in the yard (ie. debarking, chipping, conveyor system as well as machinery in the cogen plant, pellet plant, and transformer substation. • Noise effects associated with decommissioning and dismantling activities. 	<ul style="list-style-type: none"> • Mitigation measures will be developed to minimize noise impacts during construction and decommissioning. For example, all engines associated with construction equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. To the greatest extent possible, activities that could create excessive noise would be restricted to regular construction hours and adhere to any local noise regulations • A noise study will be prepared to assess the impact of the Project on any sensitive noise receptors in the area. Mitigation measures such as noise walls or quieter equipment may be implemented if required. • Operational Plans will include an appropriate maintenance schedule to ensure that all equipment functions properly in

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
		order to reduce noise due to malfunctioning equipment.
Petroleum, Oil and Gas Resources	<ul style="list-style-type: none"> • Possible impacts on existing or historic petroleum, oil and gas wells. 	<ul style="list-style-type: none"> • A review of the MNR's oil, gas and petroleum library indicated will be completed to determine whether there are resources within 75 m of the Project Area. • Appropriate clearances will be obtained from the MNR, if required.
Provincial and Local Infrastructure	<ul style="list-style-type: none"> • Temporary pressure on local services and inconvenience to local residents during construction. • Traffic delays on local and provincial roads as a result of construction-related traffic (i.e. movement of heavy equipment and facility components); • Damage to roads as a result of the movement of heavy equipment and facility components. • Ongoing disruption to traffic as a result of deliveries of biomass. 	<ul style="list-style-type: none"> • Construction Traffic Management Plans will be developed to manage the safe delivery of equipment and large machinery during construction and to manage the delivery of biomass throughout the life of the facility to minimize local traffic disruptions to the extent possible. • A Road Condition Survey will be conducted if required by MTO or the local services board. Any damage to local or provincial infrastructure as a result of construction or decommissioning activities will be repaired as quickly as possible. • Consultation will take place with the MTO and local service board regarding the need to upgrade or widen any roads in order to allow for the delivery of equipment. • Any upgrades and/or subsequent rehabilitation and maintenance/repair will be negotiated with the appropriate authorities.

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
Waste	<ul style="list-style-type: none"> • Waste ash from the cogeneration plant will require disposal • Disposal of wastes associated with construction, operations and decommissioning. 	<ul style="list-style-type: none"> • Ash will be temporarily stored onsite and then transported to an off-site landfill facility. No landfilling will occur on-site. Additional mitigation will be developed as landfilling and transportation options are further defined. • The Contractor would implement a site-specific waste collection and disposal management plan
Public Health and Safety	<ul style="list-style-type: none"> • Safety issues related to the operation of heavy equipment during construction. • Accidents, spills or malfunctions associated with project components, heavy equipment, boiler systems, sawing/grinding, pressurizing equipment and electrical systems. • Fire at the facility or within material stockpiles with the potential to spread to surrounding forests. 	<ul style="list-style-type: none"> • A Health and Safety Plan will be developed by the construction contractor and operator. • A Response Plan to outline a procedure for responding to emergencies will also be developed, as required under O. Reg. 359/09. This will include specific details with respect to communication with the public and agencies during emergencies. <ul style="list-style-type: none"> – Standard fire prevention and suppression plans and equipment will be available. – Standard containment facilities and emergency response materials would be maintained on-site as required. – Refuelling, equipment maintenance, and other potentially contaminating activities would occur in designated areas. – As appropriate spills would be reported immediately to the MOE Spills Action Centre.

Draft Project Description Report
June 2013

Environmental Component	Potential Effects	Proposed Mitigation/Additional Studies
Provincial Land Use Plans	<ul style="list-style-type: none"> The Project is not protected under the Greenbelt Plan, Lake Simcoe Protection Plan, Niagara Escarpment Plan or Oak Ridges Moraine Conservation Plan. No impacts under provincial plans or policies are anticipated. 	<ul style="list-style-type: none"> No mitigation measures are required.

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5.0 Next Steps

This Draft Project Description Report was prepared to identify the appropriate permitting process with MOE and MNR. It was also prepared to obtain a list of aboriginal communities to be consulted as required under O.Reg. 359/09. Upon receipt of the aboriginal consultation list, a public notice will be issued, and the first public meeting is anticipated to be held in July / August 2013.

In addition to completing the necessary consultation requirements, Neegan Burnside Ltd. will be conducting field surveys for the Natural Heritage Assessment and Water Assessment during July 2013. Following completion of the field studies, a complete draft set of Renewable Energy Approval reports are expected to be complete in November / December 2013.

Neegan Burnside Ltd. has prepared this Draft Project Description Report for Whitesand First Nation in accordance with O.Reg. 359/09. This report has been prepared by Burnside for the sole benefit of Whitesand First Nation, and may not be re-produced by any third party without the express written consent of Whitesand First Nation.

Written by:

Signature _____ Date June 18, 2013
Chris Shilton, P.Eng., LEED® AP
Project Manager
Neegan Burnside Ltd.

Reviewed by:

Signature _____ Date June 18, 2013
Lyle Parsons, BES
Senior Advisor
Neegan Burnside Ltd.

Approved By:

Signature _____ Date June 18, 2013
Craig Toset
Project Manager
Whitesand First Nation

6.0 References

Genivar and Great North Bio Energy, October 2012. *Whitesand First Nation – The Community Sustainability Initiative, Class 30 Opinion of Cost, 8 tph Pellet Plant & Co-Gen Facility.*

Genivar, April 11, 2012. *Biomass Fueled 3MW Cogeneration Plant & 8 MTPH Pellet Plant Budget Opinions of Costs.*

Ontario Legislative Assembly, 2012. *Renewable Energy Approvals Under Part V.0.1 of the Environmental Protection Act.* Ontario Regulation 359/09.

Ontario Ministry of the Environment, 2011. *Technical Guide to Renewable Energy Approvals*

DRAFT

Appendix A
Project Location

DRAFT

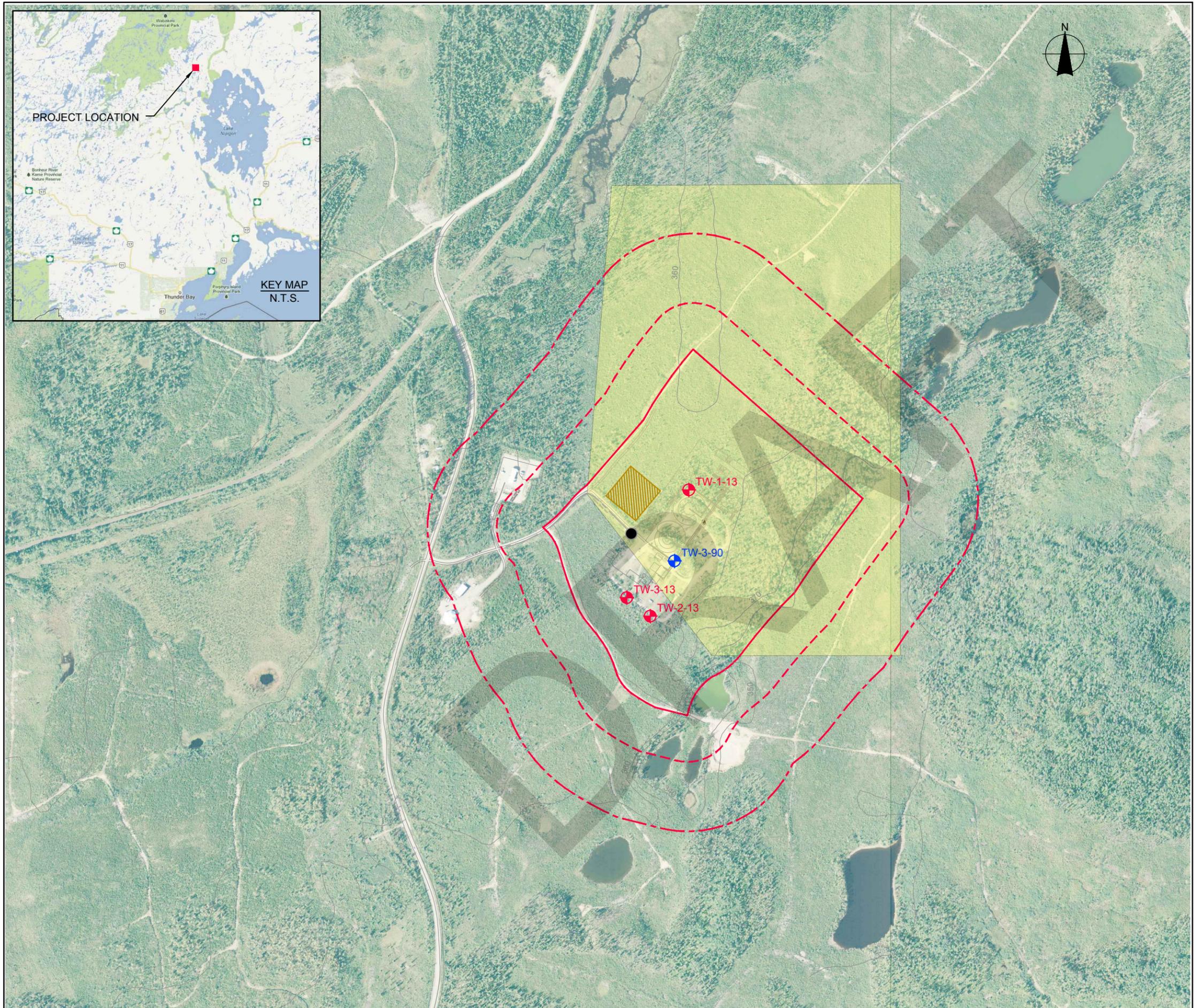


FIGURE A1

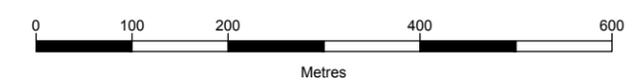
WHITESAND FIRST NATION PELLET MILL & BIOMASS PROJECT CLASS 1 THERMAL FACILITY UNDER ONTARIO REGULATION 359/09

STUDY AREA

LEGEND

- PROJECT LOCATION
- - - 120m SETBACK
- - - - - 300m SETBACK
- ⊕ MONITORING WELL LOCATION
By Others, 1990
- ⊕ MONITORING WELL LOCATION
By Neegan Burnside, 2013
- WASTEWATER MANAGEMENT SYSTEM
- AREA WITHDRAWN PER SECTION 35 OF
THE MINING ACT (ORDER No. W-TB-122/11)
- - - EXISTING ELECTRICITY DISTRIBUTION LINE
- CONNECTION POINT
- 350 EXISTING 10m CONTOURS INTERVAL (m asl)

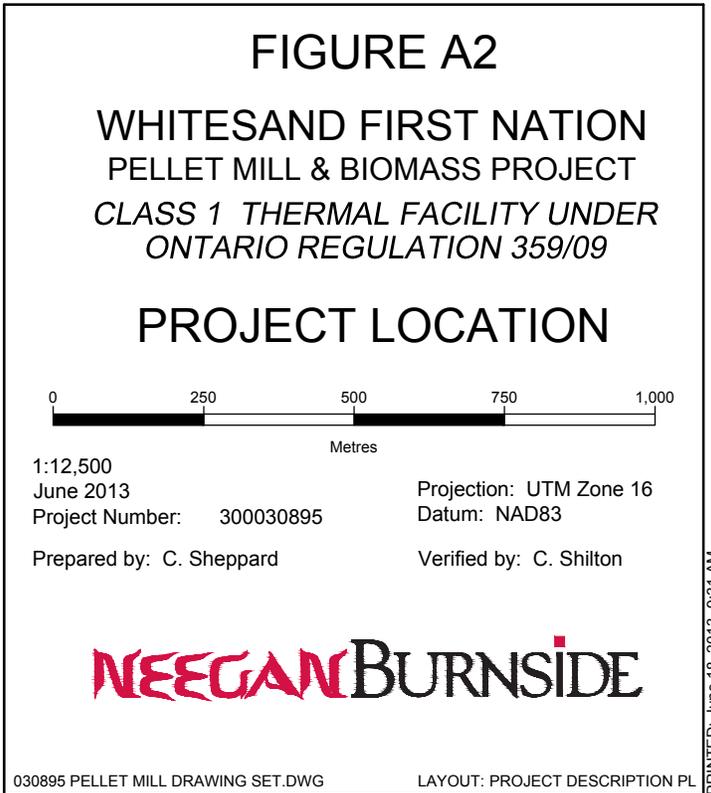
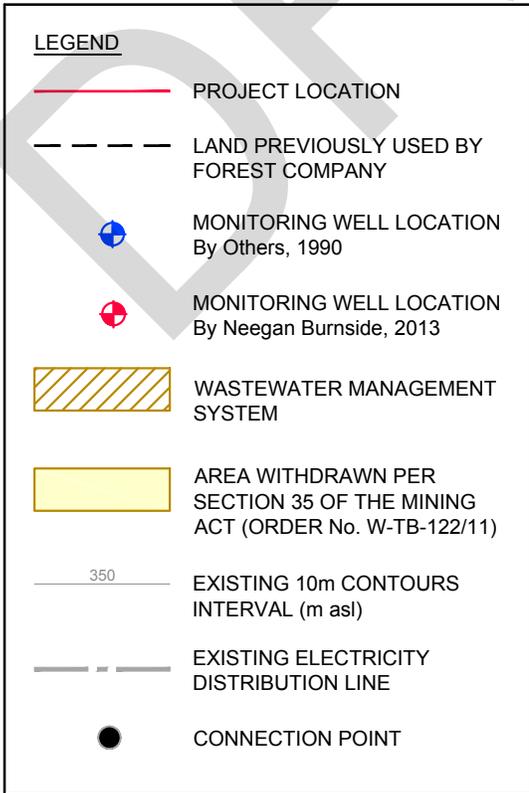
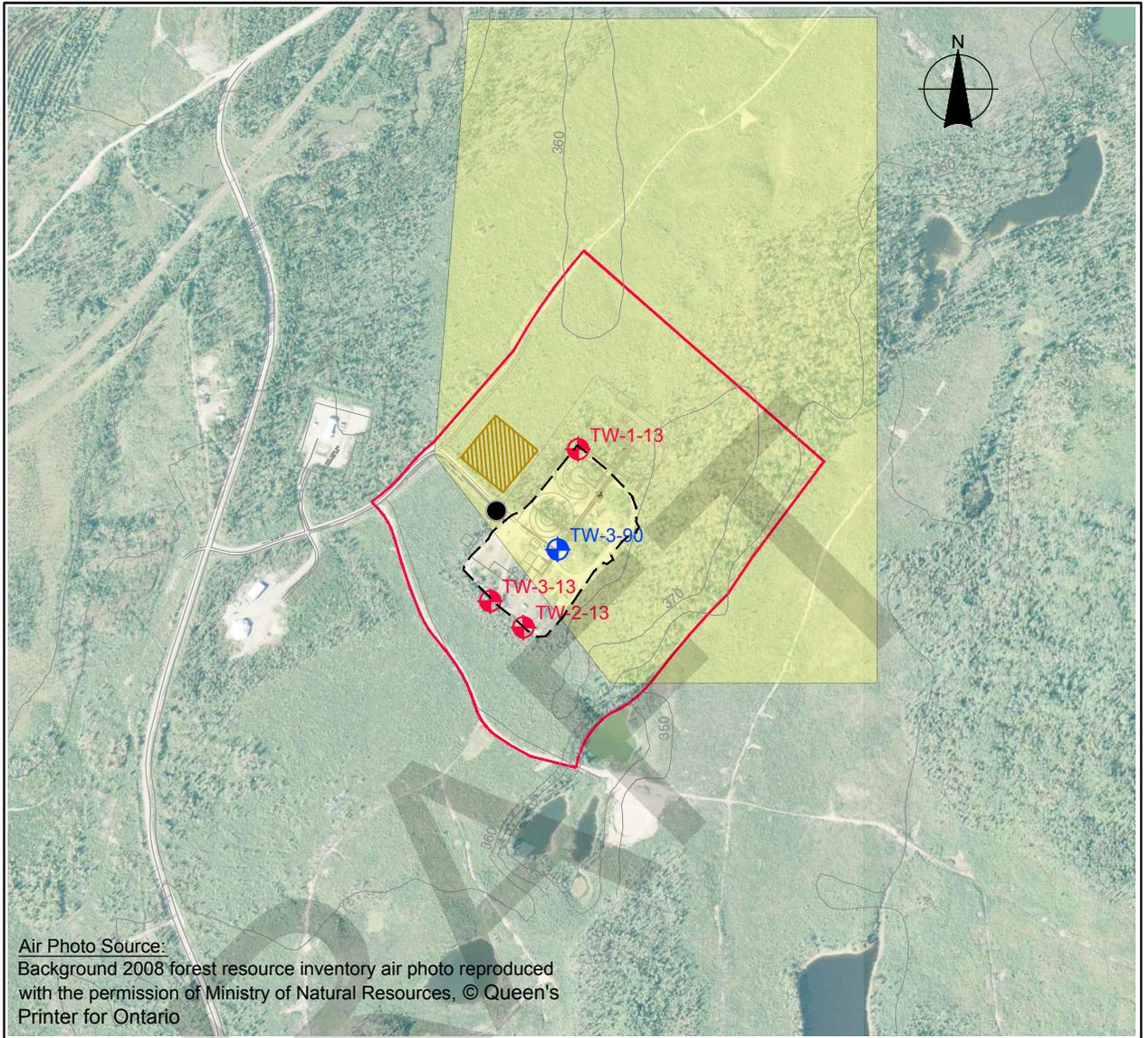
Air Photo Source:
Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario



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July 2013
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Prepared by: C. Sheppard

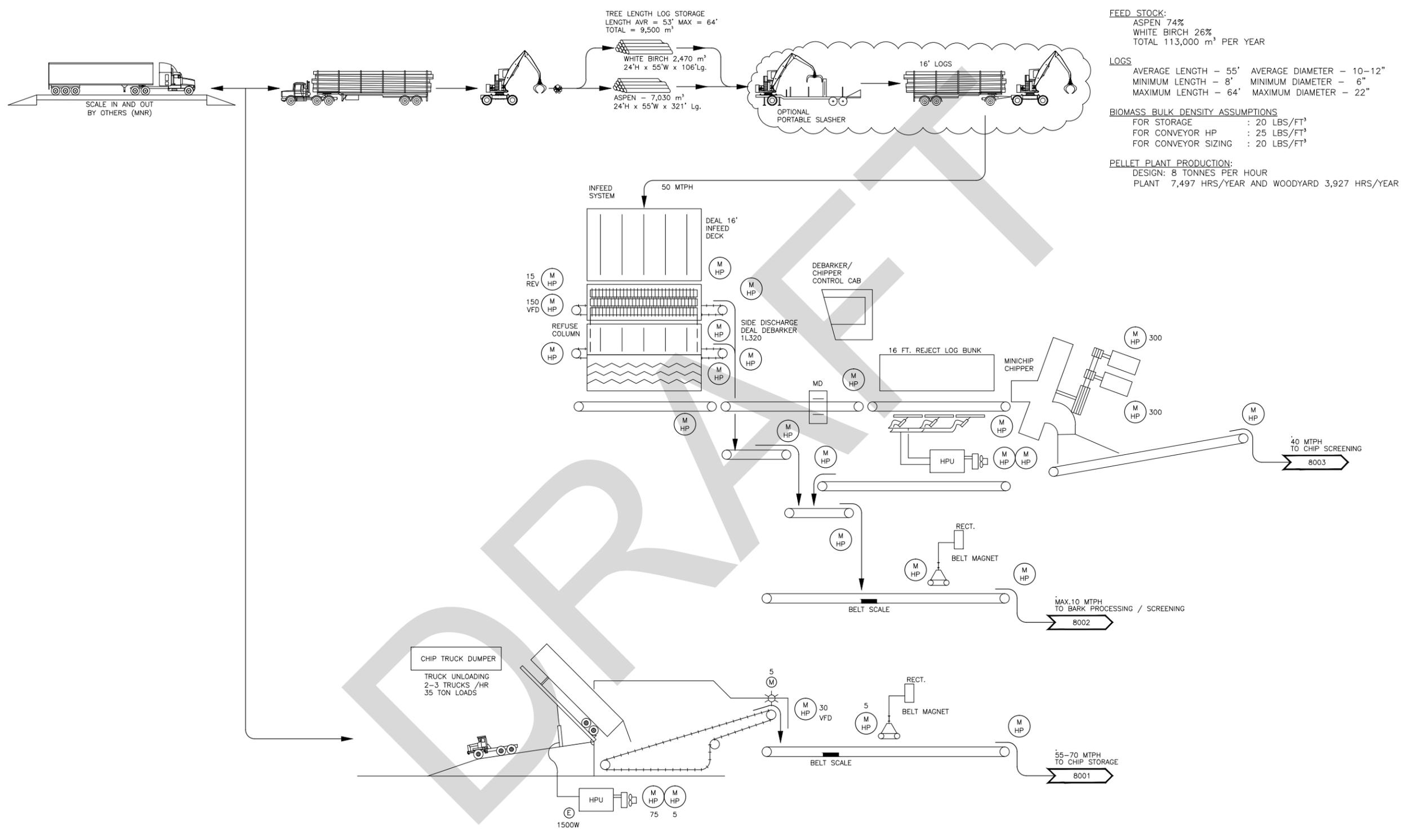
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Datum: NAD83
Verified by: C. Shilton





Appendix B
Equipment and Process Diagrams

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		A	2012/03/26	FOR REVIEW	DCH	DRW	DRW
		REV.	YYYY/MM/DD	DESCRIPTION	DRAFTER	DESIGNER	PROJ.MGR

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DESIGN CHK'D. BY:	DRW	2012/02/10
DRAWN BY:	DRW	
DRAWING CHK'D. BY:	MJE	2012/02/24
PROJECT MANAGER	DRW	
KEYWORD		

GNBE
Great North Bio Energy

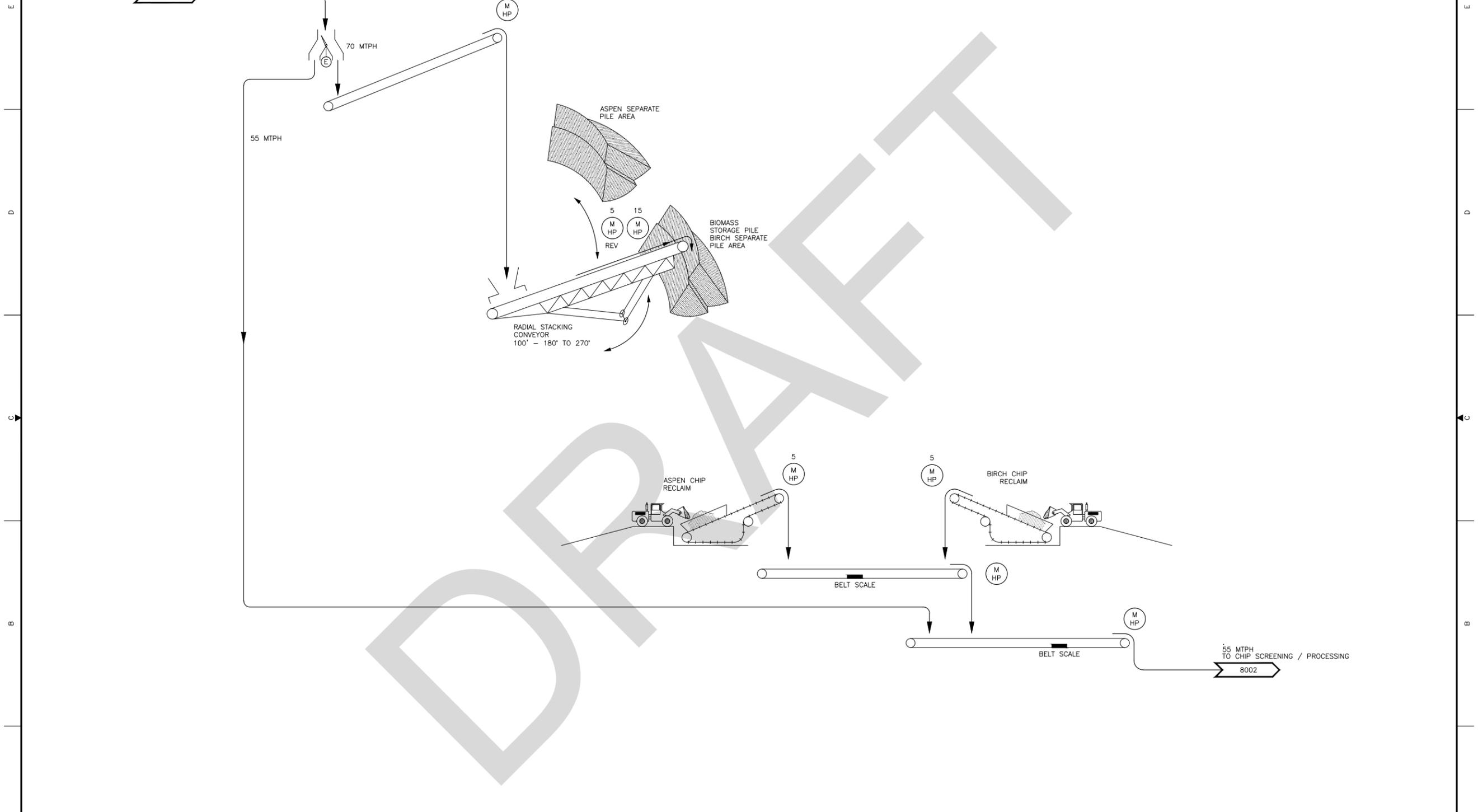
GENIVAR

740 SOUTH SYNDICATE AVENUE
THUNDER BAY, ONTARIO P7E 1E9

TEL: 807 625-6700
FAX: 807 623-4491

GENIVAR REF. NO.
121-12538-00-8000-A

PROJECT	GREAT NORTH BIO ENERGY - WHITESAND COGEN
PROJECT NO.	
TITLE	FLOW DIAGRAM PRIMARY WOOD YARD WHITESAND COGEN PELLET PLANT
CLIENT DWG. NO.	



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		A	2012/03/26	FOR REVIEW	DCH	DRW	DRW

ISSUE STATUS	FOR REVIEW
SCALE	N.T.S.

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DRAWN BY:	MJE		2012/02/24
DRAWING CHK'D. BY:			
PROJECT MANAGER	DRW		
KEYWORD			

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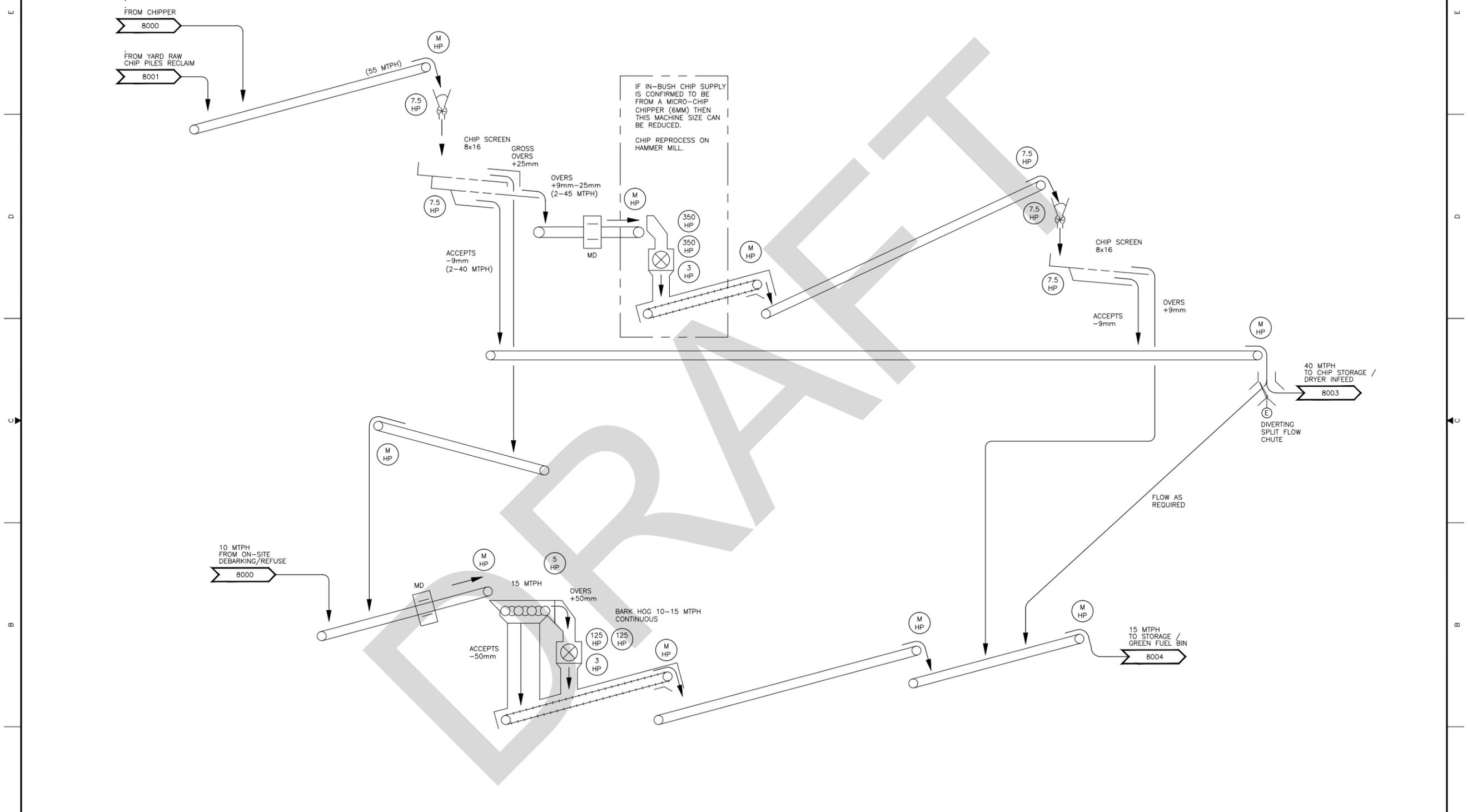
740 SOUTH SYNDICATE AVENUE
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TEL: 807 625-6700
FAX: 807 623-4491

GENIVAR REF. NO.
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PROJECT	GREAT NORTH BIO ENERGY - WHITESAND COGEN
PROJECT NO.	
TITLE	FLOW DIAGRAM IN-BUSH CHIP STORAGE WHITESAND COGEN PELLET PLANT
CLIENT DWG. NO.	

8 7 6 5 4 3 2 1



DWG. NO.	DESCRIPTION	REV.	YYYY/MM/DD	DESCRIPTION	DRAFTER	DESIGNER	PROJ.MGR
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		A	2012/03/26	FOR REVIEW	DCH	DRW	DRW

ISSUE STATUS

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DRW		
DRAWN BY:		2012/02/24
MJE		
DRAWING CHK'D. BY:		
DRW		
PROJECT MANAGER		
DRW		
KEYWORD		

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THUNDER BAY, ONTARIO P7E 1E9
www.GENIVAR.com

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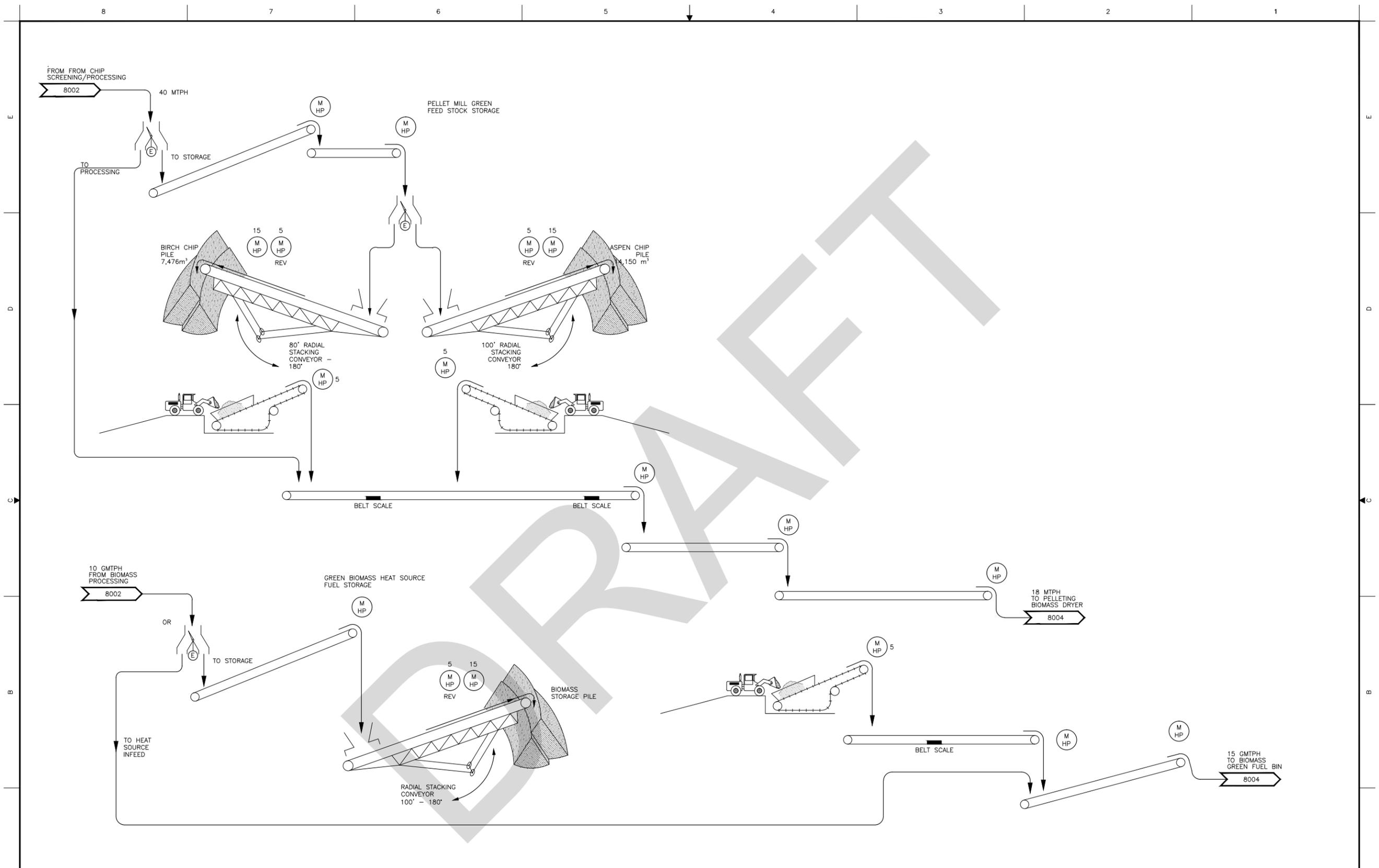
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PROJECT NO.

TITLE: FLOW DIAGRAM PROCESSING WOOD YARD WHITESAND COGEN PELLET PLANT

CLIENT DWG. NO.

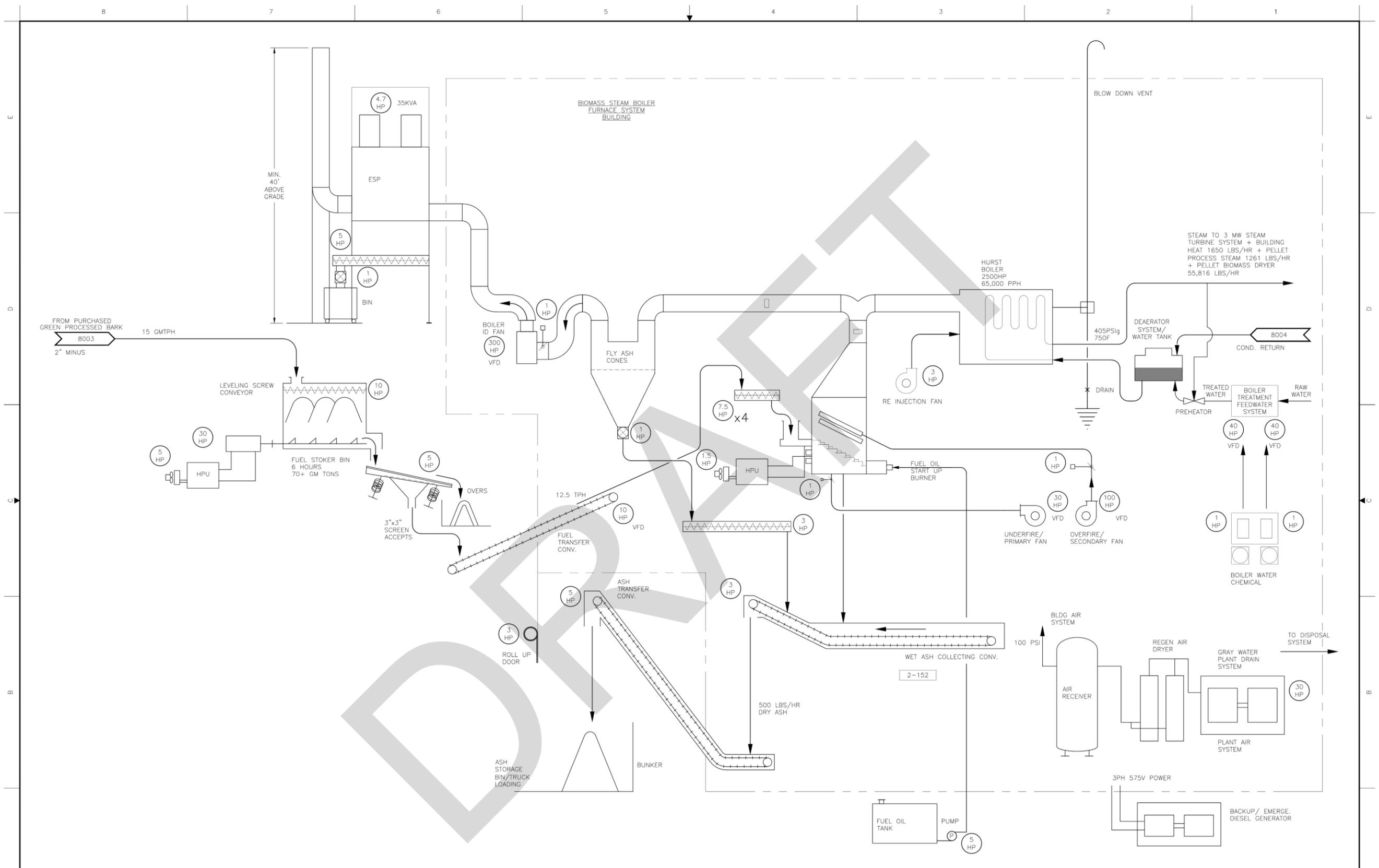


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		REV.	YYYY/MM/DD				

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PROJECT MANAGER:	2012/02/24
KEYWORD	DRW

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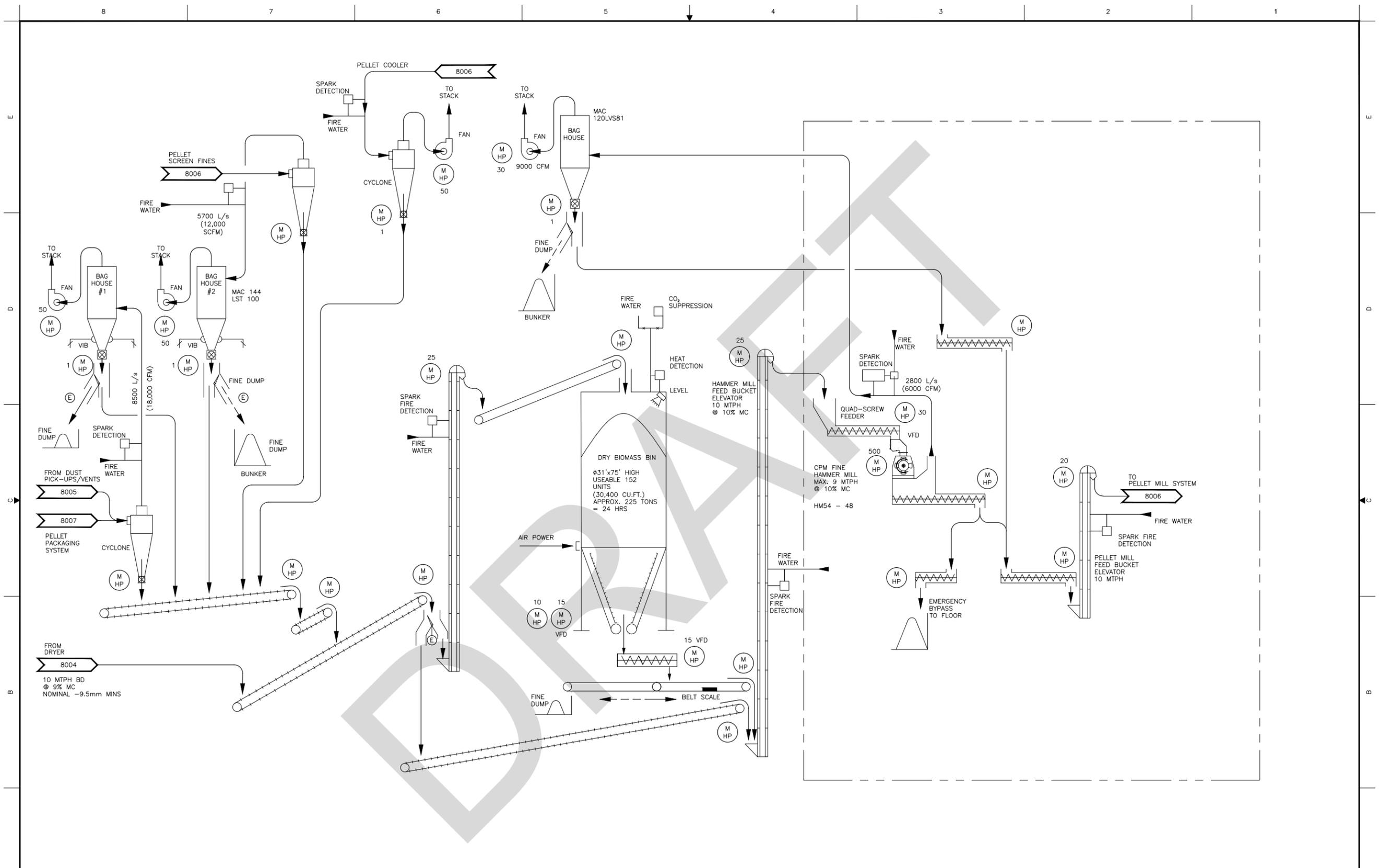


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DRAWN BY:	DCH	2012/03/14
DRAWING CHKD. BY:		
PROJECT MANAGER	DRW	
KEYWORD		

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740 SOUTH SYNDICATE AVENUE THUNDER BAY, ONTARIO P7E 1E9 www.GENIVAR.com	
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GENIVAR REF. NO. 121-12538-00-8004.1-A	

PROJECT	GREAT NORTH BIO ENERGY - WHITESAND COGEN
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CLIENT DWG. NO.	

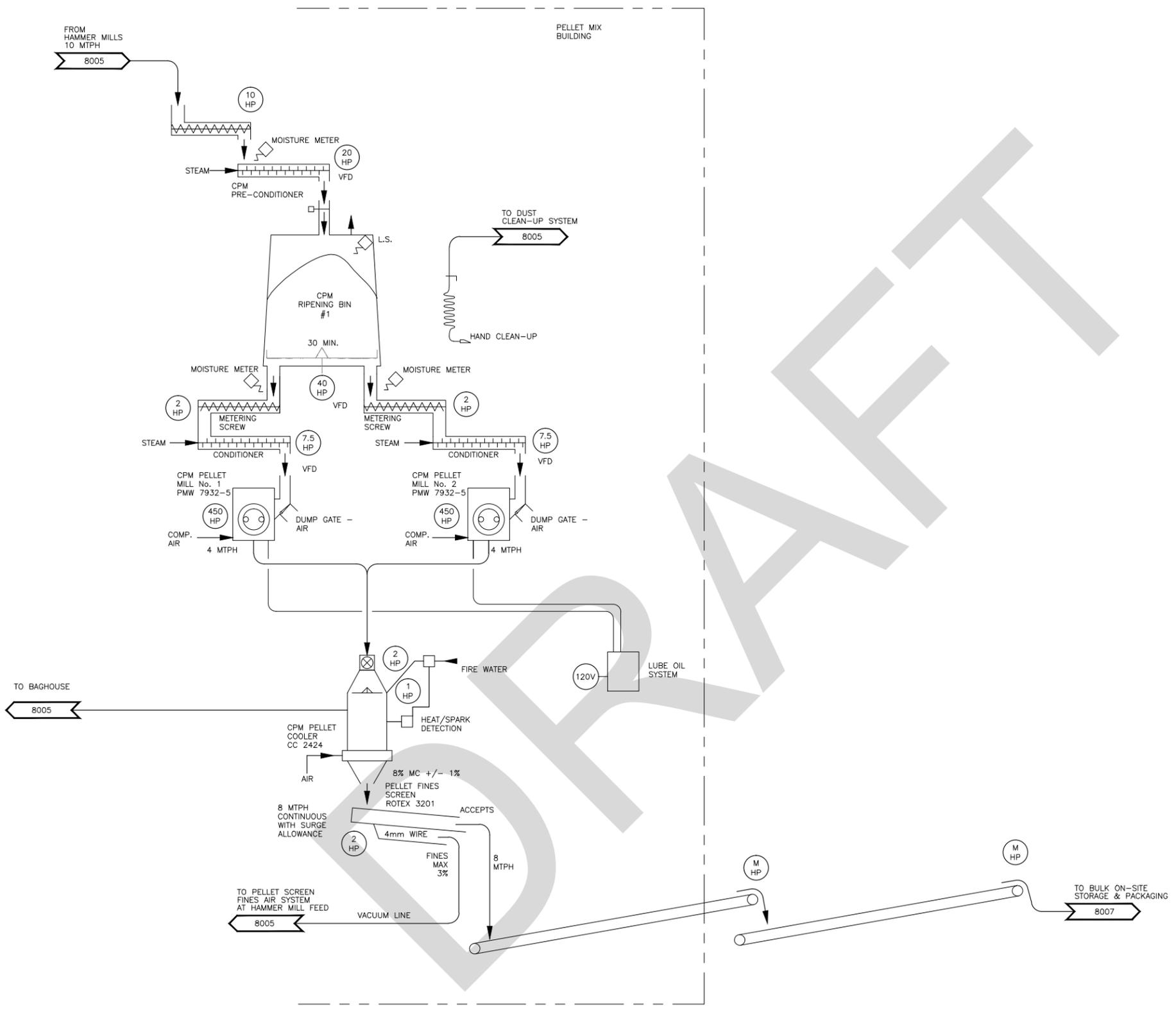


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DESIGN CHKD. BY:	DRW	2012/02/10
DRAWN BY:	MJE	2012/02/24
DRAWING CHKD. BY:	DRW	
PROJECT MANAGER	DRW	
KEYWORD		

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740 SOUTH SYNDICATE AVENUE THUNDER BAY, ONTARIO P7E 1E9	
TEL: 807 625-6700 FAX: 807 623-4491	
GENIVAR REF. NO. 121-12538-00-8005-A	

PROJECT GREAT NORTH BIO ENERGY - WHITESAND COGEN	
PROJECT NO.	
TITLE FLOW DIAGRAM FINE HAMMER MILL WHITESAND COGEN PELLET PLANT	
CLIENT DWG. NO.	



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ISSUE STATUS	
FOR REVIEW	

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PROJECT MANAGER	DRW		
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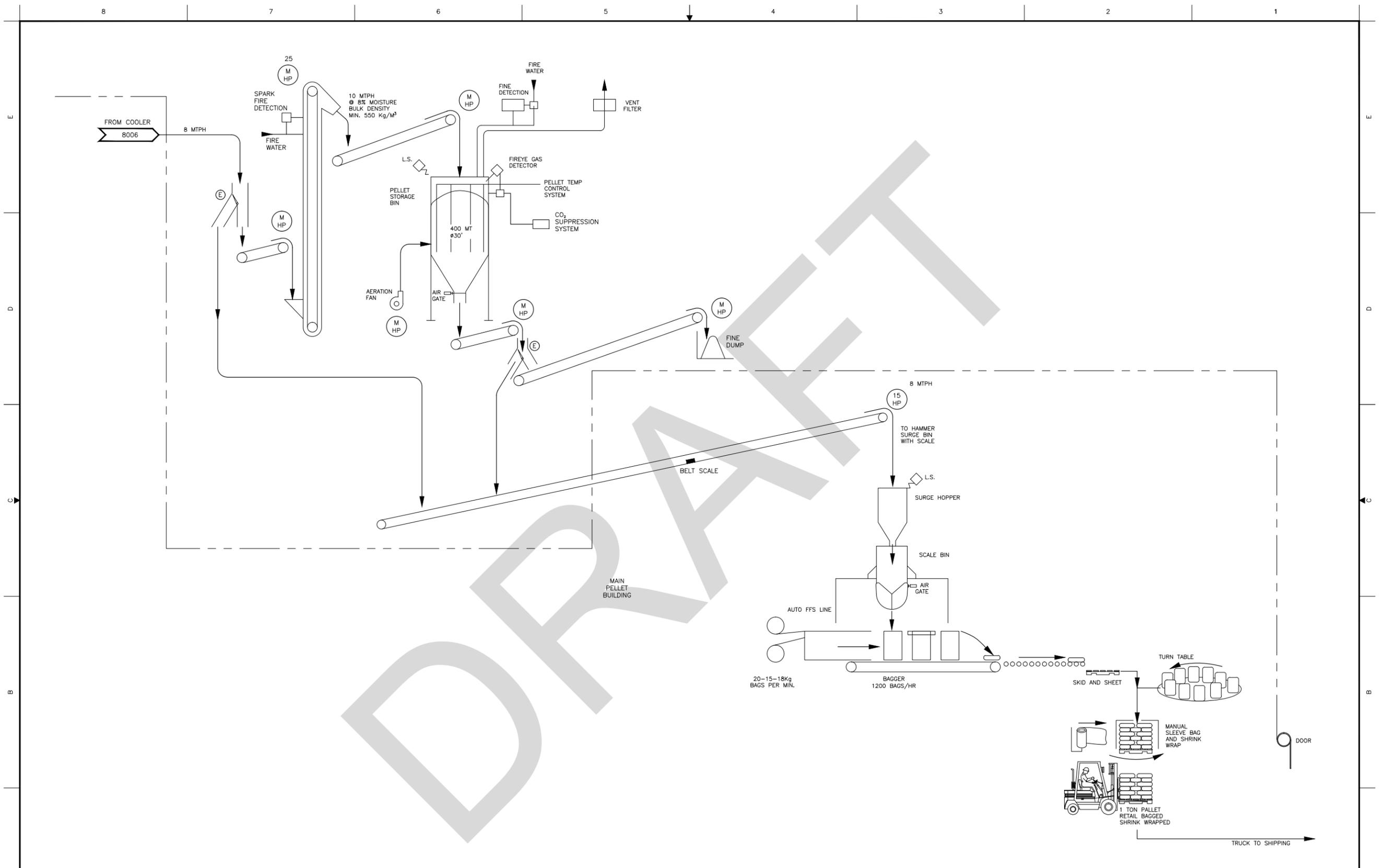
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N.T.S.




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THUNDER BAY, ONTARIO P7E 1E9
www.GENIVAR.com
TEL: 807 625-6700
FAX: 807 623-4491

GENIVAR REF. NO.
121-12538-00-8006-A

PROJECT	GREAT NORTH BIO ENERGY - WHITESAND COGEN
PROJECT NO.	
TITLE	FLOW DIAGRAM PELLETING WHITESAND COGEN PELLET PLANT
CLIENT DWG. NO.	



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ISSUE STATUS	FOR REVIEW
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DESIGNED BY:	INITIALS
DESIGN CHKD. BY:	YYYY/MM/DD
DRAWN BY:	2012/02/10
DRAWING CHKD. BY:	MJE
PROJECT MANAGER:	2012/02/24
KEYWORD	DRW

740 SOUTH SYNDICATE AVENUE THUNDER BAY, ONTARIO P7E 1E9	www.GENIVAR.com	TEL: 807 625-6700 FAX: 807 623-4491
GENIVAR REF. NO. 121-12538-00-8007-A		

PROJECT	GREAT NORTH BIO ENERGY - WHITESAND COGEN
PROJECT NO.	
TITLE	FLOW DIAGRAM SITE PELLET PACKAGING WHITESAND COGEN PELLET PLANT
CLIENT DWG. NO.	