1 TASK 3.6: POTENTIAL RELEASES OF WASTE DANGEROUS GOODS

1.1 FOCUS REPORT TASK DESCRIPTION

Clarify where the potential releases of waste dangerous goods at the Project site will be directed for treatment and/or disposal. It is important to note that the new treatment facility is not proposed to treat waste dangerous goods based on the information provided in the EARD and requirements of NSE.

1.2 DISCUSSION

1.2.1 Secondary Containment and Spill Management Study

On June 25th, 2018, Northern Pulp submitted Revision 2 of the "Secondary Containment and Spill Management Study" report, commissioned from KSH under project no. 11 1125A. The conclusions from this report were accepted by Nova Scotia Environment (NSE) on August 12th, 2018 as fulfilling the mill's obligations pertaining to Condition 14 n) and 14 r) of Industrial Approval #2011-076657-A01.

The conclusions reached in this report were as follows:

1.2.1.1 Mill Chemical Unloading and Storage Tanks

Methanol and hydrogen peroxide storage tanks are already equipped with secondary containment and, as such, require no further management measures.

A chemical incompatibility issue between sulphuric, caustic, chlorate and peroxide currently exists in the chemical unloading area. Though this is not an issue for small, localized spills, a catastrophic event such as the failure of the sulphuric acid tank would be exacerbated by the potentially violent chemical reactions between caustic / chlorate / peroxide and sulphuric acid, which would compromise the other tanks' integrity when diluted below 90%. It is recommended to construct a new sulphuric acid (H_2SO_4) storage tank, with secondary containment, in an area adjacent to the existing chlorine dioxide (ClO_2) storage tanks. This would create, once the old H_2SO_4 tank is decommissioned, a relatively clean chemical storage area, which could be managed procedurally.

While the management of major spills of sodium chlorate or chlorine dioxide from the storage area adjacent to the chemical unloading area can be managed procedurally, it is strongly recommended that secondary containment, complete with a vapour suppression system, be installed around the ClO_2 and sodium chlorate storage area because of the risks associated with atmospheric release of chlorine dioxide during a major spill, which would severely hinder response efforts as well as potentially endanger mill staff.

1.2.1.2 Process Tanks

Minor and major spills from the remaining large process tanks in the mill can be handled procedurally, as the mill currently has in place well-established communication and response plans to handle such events. These procedures would have to be modified to reflect the construction of the new effluent treatment plant and, more specifically, the installation of a new spill basin next to the untreated effluent lift station.

NPNS has included detailed procedures in its existing tank integrity program to handle all of the situations where minor and major spills occur. The design and operation of the new spill basin must be integrated into its existing emergency response procedures: this also holds true for the tanks in the chemical unloading area that are not equipped with secondary containment.

1.2.1.3 Rail Car Unloading

It was concluded that paving and proper sloping of the current rail unloading areas and the building of berms to contain potential spills from rail car unloading was sufficient to meet the requirements of Condition 14 r) of the IA, both from a logistics and capital cost stand point.

1.2.2 Replacement BAS™ Effluent Treatment System

The replacement effluent treatment system (ETF) installed on the mill site will use the Veolia BAS™ process. The BAS™ biological wastewater treatment process is the optimally designed combination of MBBR and activated sludge processes and is a leading edge process used for treatment of industrial and municipal wastewater. AnoxKaldnes™ BAS™, Biological Activated Sludge process, is a combination of Moving Bed Biofilm Reactor (MBBR) technology with conventional activated sludge (AS). MBBR is a biological wastewater treatment process that utilizes specialized polyethylene carriers (media) to create a large protected surface on which biofilm can attach. The media is mixed in the reactor, and the large surface area provides more treatment capacity in a smaller volume compared to conventional treatment methods. MBBR technology is known for providing efficient, stable and robust treatment in a small footprint.

There are many advantages of utilizing MBBR technology up front of an existing AS system including extending the capacity of the existing AS system, protecting the AS system from high organic loads, improving the efficiency of the AS system and improving the AS effluent sludge characteristics. The TME effluent quality entering the new ETF will be continuously monitored for flow, pH, temperature and conductivity and will alarm operators that one of the parameters is out of range. Any deviations outside the acceptable ranges may be cause to divert the untreated effluent to the spill basin which will trigger the operator to investigate the cause of the deviation. The operator will ensure that any material that is in the spill basin is compatible with the operation of the ETF prior to re-introducing the material into the system.

The ETF will use sulphuric acid and sodium hydroxide to control the pH of the untreated effluent prior to biological treatment. This enables the operator to maintain the optimum pH range that is desirable to the microorganisms in the ETF. These two chemicals will be stored in engineered storage tanks complete with secondary containment. The mill Emergency Response Plan will be updated to incorporate the use of these chemicals at the ETF. The deliveries will be performed by qualified operators trained under the Transportation of Dangerous Goods regulations.

The ETF will also add chemicals that will be used as nutrients for the microorganisms. A balanced nutrient ratio is essential if the microorganisms are to function at maximum efficiency. The most important of these nutrients are nitrogen and phosphorus. The treatment plant operator will adjust the ratios of these nutrients as required. Both the nitrogen and phosphorus sources will be stored in engineered storage tanks on site, similar to what is currently being used at the current effluent treatment facility. The mill Emergency Response Plan will be updated to incorporate the use of these chemicals at the ETF.

1.2.3 Expected Use of Spill Containment System

The facility is designed and the layout is such that in the event of a rupture or failure of any large dangerous goods vessel or dangerous goods storage tank, the lost material will be contained in a dyke or containment area if the tank is equipped with one. If not, the material will be directed, via the mill sewer system and effluent sewer lines, to the spill basin. Online instrumentation on the internal sewers will alert operators of an issue and valves will be operated to divert the flow into the spill basin. The new spill basin at NPNS will be designed to hold 35,000 m^3. Standard operating procedures will be developed to ensure that the effluent to be re-introduced to the ETF is compatible with the treatment system before the decision to return the materials to the system is made.

A standard operating procedure (SOP) is a set of written instructions that describes in detail how to safely perform work involving hazardous materials, hazardous equipment or hazardous operations to prevent environmental incidents. The mill has been in operation for many years and there are already many active emergency and operating procedures, as well as employees that are trained, as part of the mill's Emergency Response Team (ERT), to respond to emergencies related to dangerous goods or waste dangerous goods.

In the event that the diverted material is not compatible with the design of the effluent treatment, provisions have been made in the design to pump the content of the spill basin into tanker trucks so as to process the spilled material in a licensed, off-site facility. This diversion system is illustrated in Drawing #200-0-3011_Rev_D (attached).

As part of an existing SOP, the mill has installed pH and conductivity probes on the individual sewers in the mill that will alarm the operators of any chemical leaks or off-spec effluent. The individual chemical tanks also have high level alarms along with rate of change alarms that will alert an operator of a potential leak. Also, for each dangerous good used on site, an emergency response plan has been developed that satisfies the Federal EPA Environmental Emergency Regulations (E2) to address a potential effluent release to the environment. These procedures will be updated to include the new ETF. Steps will be taken, up to and including slowing or stopping pulp production if required to prevent any releases of dangerous goods to the environment or the effluent treatment system.

Although the effluent can be diverted to the spill basin, the spill basin in normal conditions will never be full. The mill operators on duty have level controls to monitor how full the basin is. Refer to Section 3.4 that explains in detail the sizing and appropriateness of the design of the spill basin.

1.3 SIGNATURES

Signature 

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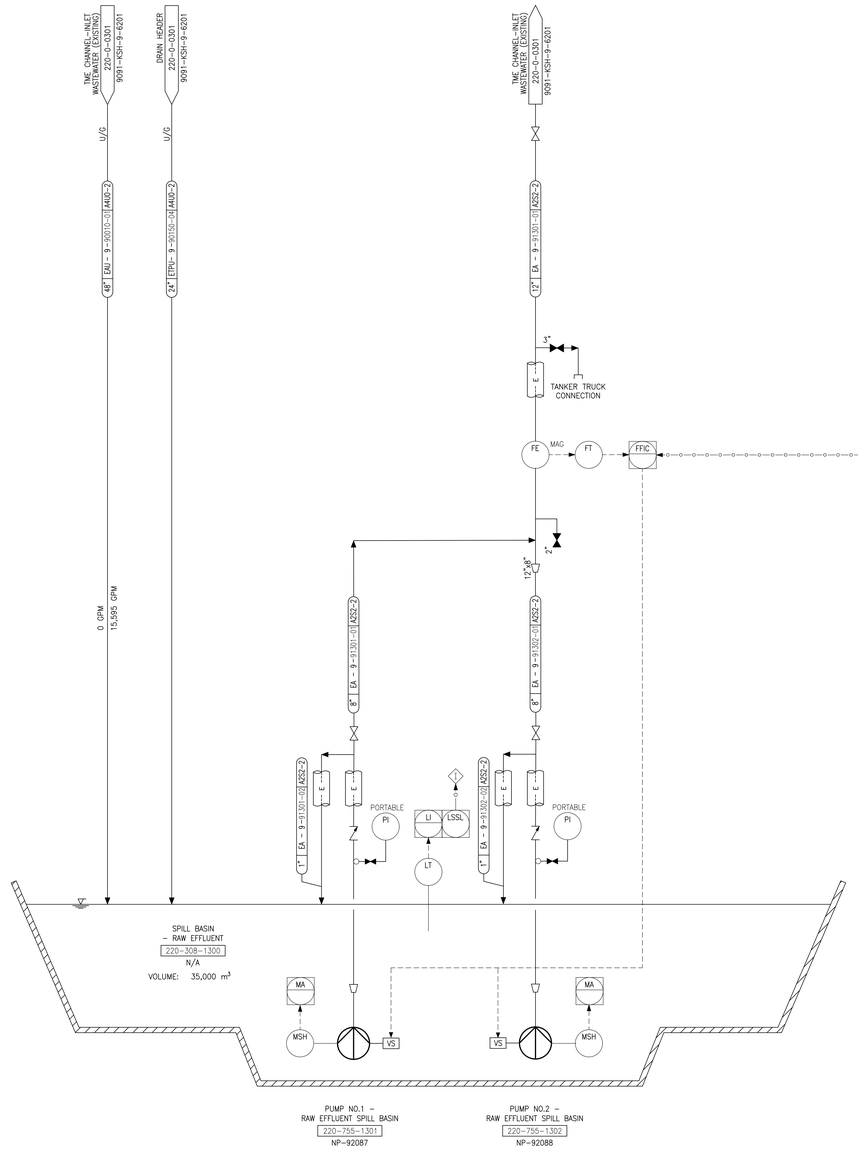
DRAWING N°.
220-0-0311



REF N°	DRAWING NUMBER	REFERENCES

REV		
D	AP 28 Aug 19	ISSUED FOR INFORMATION
C	AP 17 May 19	ISSUED FOR REVIEW & COMMENTS
B	AP 12 Oct 18	ISSUED FOR INFORMATION
A	AP 17 Jul 18	ISSUED FOR INFORMATION
REV.	APPROVAL DATE	ISSUE STATUS

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NOT FOR CONSTRUCTION

APPROVAL

SIGNATURE DATE

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KSH Solutions Inc. Montreal, Canada

NORTHERN PULP
NOVA SCOTIA CORPORATION
A PAPIER EXCELLENCE COMPANY

ETF
REPLACEMENT

P & I DIAGRAM
DEPT. 9

SPILL BASIN

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