

APPROVAL

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT **R.S.A. 2000, c.E-12, as amended.**

APPROVAL # 1702-02-00

APPLICATION # 015-1702

EFFECTIVE DATE: ~~April~~ May, 2009

EXPIRY DATE: ~~March~~ April, 2019

APPROVAL HOLDER: LAFARGE CANADA INC.

ACTIVITY: ~~-CONSTRUCTION, OPERATION AND RECLAMATION OF THE~~

Exshaw cement plant and CKD landfill

IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

Designated Director under the Act May Mah-Paulson, M.Sc., P.Eng.

Date Signed ~~April~~ May, 2009

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

- 1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.
- 1.1.2 In all PARTS of this approval:
- (a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;
 - (b) "active CKD landfill area" means the disturbed land area of the **CKD landfill** that;
 - (i) has received or is receiving cement kiln dust,
 - (ii) has not been closed, and
 - (iii) is being used or has been used for disposal, storage, processing, transport or handling of cement kiln dust;
 - (c) "**alternate raw material**" means any raw material to the cement manufacturing process at the plant that is not a natural raw material, but does not include ~~tires or other materials added primarily for fuel~~ fuels;
 - (d) "application" means the written submissions to the Director in respect of application number 015-1702 and any subsequent applications for amendments of approval number 1702-02-00;
 - (e) "**CEM**" means continuous emissions monitor;
 - (f) "CEMS Code" means the *Continuous Emission Monitoring System Code*, Alberta Environment, 1998, as amended;
 - (g) "chemical" means any substance that is added or used as part of the treatment process;
 - (h) "**CKD**" means cement kiln dust;
 - (i) "**CKD landfill**" means all buildings, structures, cells, storage facilities, material handling facilities, process and pollution abatement equipment, vessels, trenches, roadways, berms, monitoring wells, pipelines and other installations, and includes the land for the disposal of cement kiln dust and sludge from the

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Industrial Runoff Sedimentation Pond located on the Southwest Quarter of Legal Subdivision 13, Section 2622, Township 24, Range 9, West of the 5th Meridian and the Legal Subdivision 4, Section 27, Township 24, Range 9, West of the 5th Meridian;

- (j) "commence operation" means to start up the plant, process unit or equipment for the first time with the introduction of feed material, electrical or thermal energy and the simultaneous production of products for which the plant, process unit or equipment was designed excluding predetermined period of commissioning or testing;
- (k) "composite " means a refrigerated (approximately 4^oC) sample consisting of not less than twelve discrete portions of equal volume collected over a day at a rate in proportion to the flow rate of the stream sampled, and which is representative of the stream sampled;
- (l) "container" means any portable device in which a substance is kept, including but not limited to drums, barrels and pails which have a capacity greater than 18 litres but less than 210-210 litres;
- (m) "daily determination of concentration" means the determination of the concentration of a water substance or parameter in any sample by procedures authorized in this approval, and if more than one sample is collected and analyzed per day, the arithmetic average of their analytical results shall be considered as the daily determination of concentration;
- (n) "daily determination of mass" means and is obtained from the following calculation for any day:

$$\begin{aligned} &\text{daily determination of mass (kilograms/day)} \\ &= (Q \times C) / 1000 \end{aligned}$$

where: C is the daily determination of concentration in mg/L, and

Q is the total flow of the stream sampled, in cubic meters, for the day over which the sample used to determine C was collected;

- (o) "day" means any sampling period of 24 consecutive hours unless otherwise specified;
- (p) "decommissioning" means the dismantling and decontamination of a plant undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act;

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- (q) "decontamination" means the treatment or removal of substances from the plant and affected lands;
- (r) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- (s) "dismantling" means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the plant;
- (t) "downtime" means the period of time when equipment is not effectively functioning due to breakdown, repair, calibration, servicing, maintenance or replacement of any of its components;
- (u) "dry" means a condition that does not include uncombined water vapour;
- (v) "effluent stream" means any substance in a gaseous medium released by or from a plant;
- (w) "FGD" means flue gas desulphurization;
- (x) "fugitive emissions" means emissions of substances to the atmosphere other than ozone depleting substances, originating from a plant source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;
- (y) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;
- (z) "GBF" means gravel bed filter;
- (aa) "ISO 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;
- (bb) "incompatible wastes" means substances which when mixed can produce effects which are harmful to human health or the environment such as heat, pressure, fire, explosion, violent reaction, toxic dusts, mists, fumes or gases, or flammable fumes or gases, and include those substances listed in Appendix 5 of the *Guidelines for Industrial Landfills*, Alberta Environment, June 1987, as amended;

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- (cc) "industrial runoff" means precipitation that falls on or traverses the plant developed area or the active CKD landfill area for the disposal of cement kiln dust;
- (dd) "industrial runoff control system" means the parts of the plant or landfill that collect, store or treat industrial runoff from the plant or the CKD landfill;
- (ee) "Industrial Runoff Sedimentation Pond" means the treatment facility referred in application number 015-1702 that collects, stores and treats non-contact cooling water and industrial runoff from the plant developed area ~~and~~;
- (ff) "industrial wastewater" means the composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process carried on at the plant;
- (gg) "industrial wastewater control system" means the parts of the plant that collect, store or treat industrial wastewater;
- (hh) "in-stack opacity" means the degree to which visible emissions obstruct the passage of light within a stack, flue, duct or stack breaching;
- (ii) "Kiln # 4" means the existing long dry kiln system at the Exshaw cement plant used for manufacturing cement;
- (jj) "Kiln # 5" means the existing four stage preheater, precalciner rotary kiln system at the Exshaw cement plant used for manufacturing cement;
- (kk) "Kiln # 6" means the new five stage preheater, precalciner rotary kiln system at the Exshaw cement plant for manufacturing cement;
- (ll) "local environmental authority" means the Department of Environment, in the Province of Alberta, or the agency that has the equivalent responsibilities for any jurisdiction outside the Province;
- (mm) "main kiln effluent stream" means the kiln gas stream that flows up through and exits the preheater tower in a multi-stage preheater, precalciner rotary kiln system;
- (nn) "manual stack survey" means a survey conducted in accordance with the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended;
- (oo) "maximum daily" means the value not to be exceeded by any daily determination of mass or concentration;

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- (pp) "maximum daily average" means the value which is not to be exceeded as determined by the arithmetic average of all daily determinations of mass, ~~concentration~~ or as specified during any month;
- (qq) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval including equipment used for continuous monitoring;
- (rr) "month" means calendar month;
- (ss) "**NAPS**" means National Air Pollution Surveillance;
- (tt) "natural raw material" means naturally occurring materials used in the manufacture of cement including but not limited to limestone, clay, gypsum, sand, shale and iron ore;
- (uu) "net heating value" means the amount of heat generated by the complete combustion of a specific fuel when the latent heat of vaporization of water is not included;
- (vv) "plant" means all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, pipelines and other installations, and includes the land, located on ~~Northwest~~Northeast Quarter of Section 2322 and the ~~Southwest~~Southeast Quarter of Section 2622, Township 24, Range 9, West of the 5th Meridian, that is being or has been used or held for or in connection with the Exshaw cement plant;
- (ww) "plant developed area" means the areas of the plant used for the storage, treatment, processing, transport, or handling of raw material, intermediate product, by-product, finished product, process chemicals, or waste material;
- (xx) "plant high quality groundwater well" means the high quality groundwater well specified as well # 76-07-19-02, in the Interim Water Act licence # 08612;
- (yy) "QA/QC" means quality assurance and quality control;
- (zz) "quarter year" means a time period of three consecutive months designated as January, February, and March; or April, May, and June; or July, August, and September; or October, November, and December;
- (aaa) "representative grab sample" means a sample consisting of equal volume portions of water collected from at least four sites between 0.20-0.30 metres below the water surface within a pond;

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- (bbb) "run-on" means any rainwater or meltwater that drains as surface flow into the active CKD landfill area;
- (ccc) "run-on control system" means parts of the landfill that divert run-on away from the active CKD landfill area;
- (ddd) **"SNCR"** means selective non-catalytic reduction;
- (eee) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;
- (fff) "suitable quality" means topsoil having a good, fair or poor rating as described in the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture March, 1987, as amended;
- (ggg) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;
- (hhh) **"TSP"** means total suspended particulate;
- (iii) "topsoil" means the uppermost layer of suitable quality soil, containing organic matter, ordinarily moved in tillage or its equivalent in uncultivated soils;
- (jjj) "ultimate analysis" means the determination of the net heating value of coal and the coal composition including sulphur content;
- (kkk) **"VCM"** means vertical cement mill;
- (lll) "volume estimate" means a technical evaluation based on the sources contributing to the release, including, but not limited to, pump capabilities, water meters, and batch release volumes;
- (mmm) **"VRM"** means vertical raw mill;
- (nnn) "waste storage area(s)" means the area(s) designated for waste container storage and/or waste tank storage as described in the application;
- (ooo) "week" means any consecutive 7-day period unless otherwise specified.

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PART 2: GENERAL

SECTION 2.1: GENERAL

- 2.1.1 The approval holder shall immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.
- 2.1.2 The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.
- 2.1.3 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.
- 2.1.4 The approval holder shall immediately notify the Director in writing if any of the following events occurs:
- (a) the approval holder is served with a petition into bankruptcy;
 - (b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;
 - (c) a receiver or receiver-manager is appointed;
 - (d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or
 - (e) any of the assets which are the subject matter of this approval are seized for any reason.
- 2.1.5 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.
- 2.1.6 All abbreviations used in this approval follow those given in *Standard Methods for the Examination of Water and Wastewater* published jointly by the American Public Health Association, the American Water Works Association, and the Water Environment Federation, 1998, as amended, unless otherwise specified in this approval.

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- 2.1.7 *Environmental Protection and Enhancement Act* Approval numbers 1702-01-00 and 10372-02-00 are cancelled.

SECTION 2.2: RECORD KEEPING

- 2.2.1 The approval holder shall record and retain all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:
- (a) the place, date and time of sampling;
 - (b) the dates the analyses were performed;
 - (c) the analytical techniques, methods or procedures used in the analyses;
 - (d) the names of the persons who collected and analyzed each sample; and
 - (e) the results of the analyses.

SECTION 2.3: ANALYTICAL REQUIREMENTS

- 2.3.1 With respect to any sample required to be taken pursuant to this approval, the approval holder shall ensure that:
- (a) collection;
 - (b) preservation;
 - (c) storage;
 - (d) handling; and
 - (e) analysis;

shall be conducted in accordance with the following unless otherwise authorized in writing by the Director:

- (i) for air monitoring:
 - (A) the *Alberta Stack Sampling Code, Alberta Environment, 1995, as amended*;

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- (B) the *Methods Manual for Chemical Analysis of Atmospheric Pollutants*, Alberta Environment, 1993, as amended;
 - (C) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended; and
 - (D) the *CEMS Code*;
- (ii) for industrial wastewater, industrial runoff, groundwater and domestic wastewater parameters:
- (A) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended;
- (iii) for waterworks parameters:
- (A) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association and the Water Environment Federation, 1998, as amended; and
 - (B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended;
- (iv) for whole effluent toxicity tests:
- (A) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, July 1990, as amended;
 - (B) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, July 1990, as amended;
 - (C) the *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Environment Canada, Environmental Protection Series, November 1992, as amended;

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- (D) the *Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia*, -Environment Canada, Environmental Protection Series 1/RM/21, February 1992, as amended;
 - (E) the *Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows*, -Environment Canada, Environmental Protection Series 1/RM/22, February 1992, as amended; and
 - (F) the *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Environment Canada, Environmental Protection Series, 1/RM/24, November 1992, as amended;
- (v) for soil samples:
- (A) *Soil Sampling and Methods of Analysis*, Lewis Publishers, 1993, as amended;
 - (B) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846; September 1986, as amended;
 - (C) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended;
 - (D) the *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites – Volume I: Main Report*, CCME EPC-NCS62E, 1993, as amended; and
 - (E) the *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites – Volume II: Analytical Method Summaries*, CCME EPC-NCS66E, 1993, as amended;
- (vi) for waste analysis:
- (A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846, September 1986, as amended; or
 - (B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1 as amended; or

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- (C) the *Toxicity Characteristic Leaching Procedure (TCLP)* USEPA Regulation 40 CFR261, Appendix II, Method # 1311, as amended; or
 - (D) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, and the Water Environment Federation, as amended.
- 2.3.2 The approval holder shall analyze all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO 17025, as amended, for the specific parameter(s) to be analyzed, unless otherwise authorized in writing by the Director.
- 2.3.3 The term sample as used in clause 2.3.2 does not include samples directed to continuous monitoring equipment, until specifically required in writing by the Director.
- 2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

SECTION 2.4: OTHER

- 2.4.1 All tanks shall conform to the *Guideline for Secondary Containment for Above Ground Storage Tanks*, Alberta Environment, 1997, as amended, unless otherwise authorized in writing by the Director.

PART 3: CONSTRUCTION

SECTION 3.1: GENERAL

- 3.1.1 The approval holder shall notify the Director in writing at least 14 days before commencing operations of the plant expansion project ~~and modifications~~ as described in the application number 015-1702.
- 3.1.2 The approval holder shall construct the plant expansion project ~~and modifications~~ as described in the application and shall include, at a minimum, all of the following:
- (a) a Kiln # 6 complete with a low-NO_x burner ~~in~~for the kiln;
 - (b) a new Kiln # 6 baghouse and exhaust stack;

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- (c) a new Kiln # 6 bypass baghouse;
- (d) a new coal delivery system for Kiln # 6;
- (e) a new clinker cooler system for Kiln # 6;
- (f) a new VRM for Kiln # 6;
- (g) a new VCM ~~for Kiln # 6~~;
- (h) a new Kiln # 6 FGD system;
- (i) a new Kiln # 6 SNCR system;
- (j) associated infrastructure and conveyor system upgrades for the plant;
- (k) a new Kiln # 5 FGD system;
- (l) a new Kiln # 5 SNCR system;
- (m) all the other new plant baghouses specified in the Table PE-2 titled Plant Post Expansion Small Baghouses submitted with application number 015-1702;
- (n) upgrades to the stacker/reclaimer system; and
- (o) plant safety equipment and associated systems.

3.1.3 The approval holder shall submit detailed as-built drawings for the plant expansion project ~~and plant modifications~~ to the Director no longer than 6 months after commencing operation of Kiln # 6.

SNCR AQUEOUS AMMONIA STORAGE, TRANSFER AND INJECTION SYSTEM

The approval holder shall submit a written SNCR Aqueous Ammonia Storage, Transfer and Injection System proposal to the Director by ~~October~~June 1, ~~2010~~.

3.1.4 2011.

3.1.5 The SNCR Aqueous Ammonia Storage, Transfer and Injection System proposal referred to in 3.1.4 shall include, at a minimum, all of the following information:

- (a) a figure showing the final location of the storage tank(s) and the associated secondary containment structure;

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- (b) the design specifications for the storage tanks including, but not limited to, the following:
- (i) tank identification name,
 - (ii) tank contents,
 - (iii) tank capacity in m³,
 - (iv) tank construction material,
 - (v) tank operating pressure,
 - (vi) tank pressure safety valve,
 - (vii) tank vacuum relief valve,
 - (viii) inclusion of any tank level detectors, high level alarms and/ or automatic shut-off devices, ~~and~~
 - (ix) method of leak detection, and
 - (x) aboveground spill collection device at the tank loading area. ~~;~~
- (c) the design specifications for the following equipment:
- (i) aqueous ammonia transfer equipment. ~~;~~ and
 - (ii) aqueous ammonia injection equipment.
- 3.1.6 If the SNCR Aqueous Ammonia Storage, Transfer and Injection System ~~proposal~~ is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director ~~as outlined in writing by the Director~~ by the deadline specified in writing by the Director.
- 3.1.7 The approval holder shall implement the SNCR Aqueous Ammonia Storage, Transfer and Injection System proposal as authorized in writing by the Director.
- 3.1.8 The approval holder shall only store 11% to 35 % aqueous ammonia by weight for use in the SNCR ~~systems~~systems to control oxides of nitrogen.

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SECTION 3.2: AIR

3.2.1 The approval holder shall construct all stacks according to the following height requirements as prescribed in TABLE 3.2-A.

TABLE 3.2-A: ~~STACK~~ STACK HEIGHTS

| STACK | MINIMUM HEIGHT ABOVE GRADE (metres) |
|-----------------------------|-------------------------------------|
| Kiln # 6 main exhaust stack | 132.0 |
| VCM exhaust stack | 32.9 |

AMBIENT AIR MONITORING EQUIPMENT

- 3.2.2 The approval holder shall install by November 1, 2009, at a minimum, ~~all of~~ the following ~~ambient air~~ monitoring equipment:
- (a) one ~~high volume sampling monitoring~~ station located west of the plant for monitoring background ambient air concentrations of:
 - (i) TSP, and
 - (ii) PM_{2.5};
 - (b) two ~~high volume sampling monitoring~~ stations located on the eastern boundary of the plant site for monitoring ambient air concentrations of:
 - (i) TSP, and
 - (ii) PM_{2.5};
 - (c) a continuous TSP monitor located at the Exshaw continuous ambient air monitoring station; and
 - (d) a meteorological station ~~located at~~ a location authorized in writing by the Exshaw ambient air monitoring station Director.
- 3.2.3 The approval holder shall equip the new Kiln # 6 ~~baghouse~~ main exhaust stack with sampling facilities.
- 3.2.4 The sampling facilities required by 3.2.3 shall, at a minimum, be:

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- (a) installed;
 - (b) operated; and
 - (c) maintained;
- to comply with:
- (i) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,
 - (ii) the *CEMS Code*, and
 - (iii) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended.

POLLUTION ABATEMENT EQUIPMENT

- 3.2.5 The approval holder shall install, at a minimum, all of the following pollution abatement equipment as described in the application:
- (a) a baghouse on the Kiln # 6 main exhaust stack;
 - (b) a baghouse on Kiln # 6 alkali by-pass;
 - (c) a Kiln # 6 FGD system;
 - (d) a Kiln # 6 SNCR system;
 - (e) a Kiln # 5 FGD system;
 - (f) a Kiln # 5 SNCR system;
 - (g) a baghouse on VCM; and
 - (h) all the other new plant baghouses specified in the Table PE-2 titled Plant Post Expansion Small ~~Dust Collectors~~Baghouses submitted with application number 015-1702.
- 3.2.6 The approval holder shall install a bag leak detection system on the Kiln # 5 baghouse by ~~March~~June 1, 2010.
- 3.2.7 The approval holder shall install a bag leak detection system on the Kiln # 6 baghouse prior to commencing operations of Kiln # 6.

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3.2.8 The approval holder shall:

- (a) install;
- (b) operate;
- (c) calibrate; and
- (d) maintain;

each bag leak detection system referred to 3.2.6, 3.2.7 and 3.7.2.7 (b) (ii), in accordance with the manufacturer's written specifications and recommendations.

SECTION 3.3: INDUSTRIAL WASTEWATER

3.3.1 The approval holder shall construct the Zero Water Discharge Project according to application number 015-1702 and this approval.

3.3.2 The Zero Water Discharge Project shall include, at a minimum, all of the following:

- (a) cooling tower;
- (b) water chemical treatment system;
- (c) water filter system;
- (d) cooling water dump storage tank; and
- (e) new pump building and associated pumps.

SECTION 3.4: WASTE MANAGEMENT

3.4.1 Effective MayJune 1, 2010, the approval holder shall equip the tanks within the waste storage area (s), at a minimum, with all of the following:

- (a) sensors or devices for detecting the level in each tank;
- (b) high level alarms that activate when a tank overfill is imminent on tanks that have pumping systems;
- (c) automatic shut-off devices or sufficient freeboard space above the high level sensor to allow operators time to prevent overfill from occurring on tanks that have pumping systems; and

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- (d) earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.

SECTION 3.5: WATERWORKS

- 3.5.1 ~~The~~ By November 1, 2010 the approval holder shall:
- (a) construct a water pipeline from the plant high quality groundwater well to the Quarry Garage for the supply of potable water in the Quarry Garage ~~by October 1, 2010.~~ ; or
 - (b) provide potable water from:
 - (i) the plant high quality groundwater well, or
 - (ii) a waterworks system holding a current approval or registration under the Actto a cistern or holding tank at the Quarry Garage for the supply of potable water in the Quarry Garage;
 - (c) connect to a waterworks system holding a current Approval or Registration under the Act for the supply of potable water in the Quarry Garage.

SECTION 3.6: LAND CONSERVATION

Not used at this time.

SECTION 3.7: PLANT AIR POLLUTION ABATEMENT EQUIPMENT UPGRADE PLAN

- 3.7.1 If construction of the plant expansion project ~~and modifications~~ as described in application 015-1702 ~~have~~has not:
- (a) commenced within 2 years of the issuance date of this approval; or
 - (b) completed construction within 5 years of the issuance date of this approval
- the approval holder shall:
- (i) upgrade the plant's air pollution abatement equipment, and
 - (ii) decommission the former air pollution abatement equipment.

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- 3.7.2 The upgrades to the plant's air pollution abatement equipment referred to in 3.7.1-;
- (a) shall be completed within 5 years of the issuance date of this approval;
 - (b) shall include, at a minimum, all of the following:
the replacement of Kiln # 4 electrostatic precipitator with a new baghouse;:
 - (i) .
 - (ii) the installation of a bag leak detection system on the new Kiln # 4 baghouse,
 - (iii) the replacement of Kiln # 4 clinker cooler GBF with a new baghouse;:
and
 - (iv) the replacement of Kiln # 5 clinker cooler GBF with a new baghouse.
- 3.7.3 The approval holder shall submit as-built drawings and design and performance specifications for the upgrades to the current plant air pollution abatement equipment referred to in 3.7.2 to the Director ~~the following,~~ within six months of the completion date of the construction of the upgrades to plant's air pollution abatement equipment.

SECTION 3.8: PLANT NOISE MITIGATION AND CONTROL

- 3.8.1 The approval holder shall implement the plant noise mitigation and control commitments, as specified in the letter dated ~~January 27~~April 20, 2009 titled **Lafarge Commitments to Noise for the Renewal and Expansion of the Lafarge Exshaw Cement Plant Approval under AENV, AENV, EPEA #No. 1702-01-00** submitted with application number 015-1702.
- 3.8.2 The approval holder shall comply with the requirements and recommended practices for noise control set out in ~~Directive;~~ *38 Noise Control, Energy Resources Conservation Board, February 16, 2007* as amended:
- (a) within 12 months of commissioning ~~of~~ the new Kiln # 6 system; or
 - (b) by December 31, 2012, if construction of the plant expansion project and modifications as described in application 015-1702 ~~have~~has not commenced within 2 years of the issuance of this approval.

PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING

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SECTION 4.1: AIR

OPERATIONS

- 4.1.1 The approval holder shall not release any effluent streams to the atmosphere except as provided in this approval.
- 4.1.2 The approval holder shall only use the following alternate raw materials as specified in application number 015-1702:
- (a) fly ash;
 - (b) ~~iron~~-mill scale;
 - (c) used plant refractory bricks;
 - (d) glass;
 - (e) grinding aids;
 - (f) CKD;
 - (g) ferrous granules trail slag;
 - (h) fluidized boiler ash;
 - (i) aluminum catalyst;
 - (j) contaminated soils;
 - (k) concrete from on-site decommissioning projects;
 - (l) lime kiln dust; and
~~any other alternate raw material as authorized in writing by the Director.~~
 - (m) lime sludge.
- 4.1.3 Except as provided for by the Director in writing, the approval holder shall control fugitive emissions and any source not specified in 4.1.~~86~~ and 4.1.~~49~~16 in accordance with 4.1.~~54~~ of this approval.
- 4.1.4 With respect to fugitive emissions and any source not specified in 4.1.~~64~~1.6 and 4.1.~~xx~~16 the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:

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- (a) impairment, degradation or alteration of the quality of natural resources; or
 - (b) material discomfort, harm or adverse affect to the well being or health of a person; or
 - (c) harm to property or to plant or animal life.
- 4.1.5 The sampling required by 4.1.~~4613~~ and 4.1.~~2723~~ shall, at a minimum, comply with:
- (a) the *Alberta Stack Sampling Code*, Alberta Environment, 1995 as amended;
 - (b) the *CEMS Code*; and
 - (c) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended.

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- 4.1.6 Prior to commencing operations of Kiln # 6, the approval holder shall only release effluent streams to the atmosphere from the following sources:
- (a) the Kiln # 5 baghouse main exhaust stack;
 - (b) the Kiln # 4 electrostatic precipitator exhaust stack;
 - (c) the Kiln # 4 clinker cooler gravel bed filter exhaust stack;
 - (d) the Kiln # 5 clinker cooler gravel bed filter exhaust stack;
 - (e) the Raw Mill # 1 baghouse vent;
 - (f) the Raw Mill # 2 baghouse vent;
 - (g) the Finish Mill # 1 baghouse vent;
 - (h) the Finish Mill # 2 baghouse vent;
 - (i) the ~~coal storage site~~VCM baghouse ~~vent~~exhaust stack;
 - (j) the following baghouses specified in Table PE-2 Plant Post-Expansion Small Baghouses submitted with application number 015-1702:
 - (i) ESW446DC01,
 - (ii) ESW446DC12,

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- (iii) [ESW446DC13](#),
- (iv) [ESW446DC20](#),
- (v) [ESW446DC21](#), and
- (k) all the other plant baghouses specified in [the Table](#) PE-1 titled Plant Pre-Expansion Small Baghouses submitted with application number 015-1702; and
- (l) the two diesel-fired emergency electrical generators exhaust stacks.

4.1.7 Prior to commencing operations of Kiln # 6, the approval holder shall maintain the following stacks according to the minimum height requirements in TABLE 4.1-A.

TABLE 4.1-A:— STACK HEIGHTS PRIOR TO COMMENCING OPERATIONS OF KILN # 6

| STACK | MINIMUM HEIGHT ABOVE GRADE (metres) |
|---|-------------------------------------|
| Kiln # 4 main exhaust stack | 90.0 |
| Kiln # 4 clinker cooler GBF exhaust stack | 32.9 |
| Kiln # 5 main exhaust stack | 90.1 |
| Kiln # 5 clinker cooler GBF exhaust stack | 32.9 |
| VCM baghouse exhaust stack (once the VCM commences operation) | 32.9 |

4.1.8 Prior to commencing of operations of Kiln # 6, the approval holder shall:

- (a) collect; and
- (b) direct:
 - (i) the effluent stream from Kiln # 4 to the Kiln # 4 electrostatic precipitator, and then to the Kiln # 4 main stack,
 - (ii) the main effluent stream from Kiln #5 to the Kiln # 5 baghouse, and then to the Kiln # 5 main stack,

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- (iii) the effluent stream from Kiln #5 from the alkali by-pass to the associated electrostatic precipitator and then to the Kiln # 5 main stack,
- (iv) the effluent stream from the coal mill to the coal mill baghouse and then to the Kiln # 5 main stack,
- (v) the effluent stream from Kiln # 4 clinker cooler to the Kiln # 4 clinker cooler GBF, and then to the Kiln # 4 clinker cooler GBF exhaust stack,
- (vi) the effluent stream from Kiln # 5 clinker cooler to the Kiln # 5 clinker cooler GBF, and then to the Kiln # 5 clinker cooler GBF exhaust stack,
- (vii) the effluent streams from the following sources to their associated baghouses, as described in the application:
 - (A) Raw Mills #s 1 and 2; ~~and~~
 - (B) Finish Mills #s 1 and 2; and
 - (C) VCM;
- (viii) the effluent streams from all other processing, handling and storage facilities to all the other plant baghouses specified in the Table PE-1 titled Plant Pre- Expansion Small Baghouses submitted with application number 015-1702; and
- (ix) the effluent streams from the following baghouses specified in the Table PE-1 titled Plant Pre- Expansion Small Baghouses submitted with application number 015-1702:
 - (A) ESW446DC01;
 - (B) ESW446DC12;
 - (C) ESW446DC13;
 - (D) ESW446DC20;
 - (E) ESW446DC21.

4.1.9 The approval holder shall manage the dustmaterial collected in the air pollution abatement equipment by:

- (a) recycling the dustmaterial back into the cement manufacturing process; or

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- (b) selling the dustmaterial as a product; or
 - (c) disposing of the dustmaterial in the CKD landfill, if the material is CKD.
- 4.1.10 Prior to commencing operations of Kiln # 6, the approval holder must retain the full capability to use natural gas as fuel in the following:
- (a) Kiln # 4; and
 - (b) Kiln # 5.
- 4.1.11 In addition to the limits specified in 4.1.12 and prior to commencing operations of Kiln # 6, the approval holder shall not operate the process equipment unless and until the following pollution abatement equipment associated with the process equipment is operating:
- (a) the Kiln # 4 electrostatic precipitator;
 - (b) the Kiln # 4 clinker cooler GBF;
 - (c) the Kiln # 5 baghouse;
 - (d) the Kiln # 5 alkali-bypass electrostatic precipitator;
 - (e) the Kiln # 5 clinker cooler GBF;
 - (f) the Raw Mill # 1 baghouse;
 - (g) the Raw Mill # 2 baghouse;
 - (h) the Finish Mill # 1 baghouse;
 - (i) the Finish Mill # 2 baghouse;
 - (j) the VCM baghouse;
 - (k) the Coal mill baghouse; and
 - (l) all the other plant baghouses specified in the Table PE-1 titled Plant Pre-Expansion Small Baghouses submitted with application number 015-1702.

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AIR LIMITS – PRE-EXPANSION OF THE PLANT

4.1.12 Prior to commencing operations of Kiln # 6, releases of the following substances to the atmosphere shall not exceed the limits specified in TABLE 4.1-B.

TABLE 4.1-B: STACK EMISSION LIMITS
PRIOR TO COMMENCING OPERATIONS OF KILN # 6

| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION |
|---|---|---|
| Kiln # 4 Main Exhaust Stack | Sulphur Dioxide | 114.8 kg per hour |
| | | 60.0 kg per hour based on a 720 hourly rolling average |
| | Oxides of Nitrogen | 525.8 kg per hour |
| | | 241.3 kg per hour based on a 720 hourly rolling average |
| | Particulate | 0.xxx g of particulate/kg of effluent |
| | Heavy Metals | Class I: 1.5 mg/m ³ |
| | Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc) | Class II: 0.5 mg/m ³ |
| Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium) | Class III: 0.15 mg/m ³ | |
| Class III (the sum of cadmium, mercury and thallium) | Limit(s) presently under development | |
| Mercury (The specific mercury parameter(s) are under development.) | | |
| Kiln # 5 Main Exhaust Stack | Sulphur Dioxide | 468.0 kg per hour |
| | | 257.0 kg per hour based on a 720 hourly rolling average |
| | Oxides of Nitrogen | 665.1 kg per hour |

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| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | |
|---------------------------------------|---|--|---|
| | | 379.0 kg per hour based on a 720 hourly rolling average | |
| | Particulate | 0.xxx g of particulate/kg of effluent | |
| | Heavy Metals Heavy Metals | | |
| | Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc) | Class I: 1.5 mg/m ³ | |
| | Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium) | Class II: 0.5 mg/m ³ | |
| | Class III (the sum of cadmium, mercury and thallium) | Class III: 0.15 mg/m ³ | |
| | Mercury (The specific mercury parameter(s) are under development.) | Limit(s) presently under development | |
| Kiln # 4 Clinker Cooler Exhaust Stack | Particulate | 0.xxx g of particulate/kg of effluent | |
| Kiln # 5 Clinker Cooler Exhaust Stack | Particulate | 0.xxx g of particulate/kg of effluent | |
| Plant Total | Sulphur Dioxide | 498.8 tonnes per quarter year | |
| <u>Kiln # 4 Main Exhaust Stack</u> | <u>Sulphur Dioxide</u> | <u>114.8 kg per hour</u> | <u>103.3 kg per hour (Effective 6 years after the issuance date of this approval)</u> |
| | | <u>60.0 kg per hour based on a 720 hourly rolling average</u> | <u>54.0 kg per hour (Effective 6 years after the issuance date of this approval)</u> |
| | <u>Oxides of Nitrogen</u> | <u>525.8 kg per hour</u> | |
| | | <u>241.3 kg per hour based on a 720 hourly rolling average</u> | |

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| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | | |
|------------------------------------|--|--|--|---|
| | <u>Particulate</u> | <u>0.20 g of particulate/kg of effluent</u> | | <u>0.06 g of particulate/kg of effluent (Effective 5 years after the issuance date of this approval)</u> |
| | <u>Heavy Metals</u> <ul style="list-style-type: none"> • <u>Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc)</u> • <u>Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium)</u> • <u>Class III (the sum of cadmium, mercury and thallium)</u> | <u>Class I: 1.5 mg/m³</u> <u>Class II: 0.5 mg/m³</u> <u>Class III: 0.15 mg/m³</u> | | |
| <u>Kiln # 5 Main Exhaust Stack</u> | <u>Sulphur Dioxide</u> | <u>559.0 kg per hour (Until April 30, 2010)</u> | <u>(468.0 kg per hour (Effective May 1, 2010))</u> | <u>421.2 kg per hour (Effective 6 years after the issuance date of this approval)</u> |
| | | <u>257.0 kg per hour based on a 720 hourly rolling average</u> | | <u>231.3 kg per hour based on a 720 hourly rolling average (Effective 6 years after the issuance date of this approval)</u> |
| | <u>Oxides of Nitrogen</u> | <u>665.1 kg per hour</u> | | |
| | | <u>379.0 kg per hour based on a 720 hourly rolling average</u> | | |
| | <u>Particulate</u> | <u>0.06g of particulate/kg of effluent</u> | | |
| | <u>Heavy Metals Heavy Metals</u> <ul style="list-style-type: none"> • <u>Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc)</u> • <u>Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium)</u> • <u>Class III (the sum of cadmium, mercury and thallium)</u> | <u>Class I: 1.5 mg/m³</u> <u>Class II: 0.5 mg/m³</u> <u>Class III: 0.15 mg/m³</u> | | |

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| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | |
|--|------------------------|---|--|
| | | | |
| <u>Kiln # 4 Clinker Cooler Exhaust Stack</u> | <u>Particulate</u> | <u>0.10 g of particulate/kg of effluent</u> | <u>0.06 g of particulate/kg of effluent</u> <u>(Effective 5 years after the issuance date of this approval)</u> |
| <u>Kiln # 5 Clinker Cooler Exhaust Stack</u> | <u>Particulate</u> | <u>0.10 g of particulate/kg of effluent</u> | <u>0.06 g of particulate/kg of effluent</u> <u>(Effective 5 years after the issuance date of this approval)</u> |
| <u>Plant Total</u> | <u>Sulphur Dioxide</u> | <u>498 tonnes per quarter year</u> | <u>450 tonnes per quarter year</u> <u>(Effective 6 years after the issuance date of this approval)</u> |

- 4.1.13 Prior to commencing operations of Kiln # 6, the approval holder shall monitor the emission sources as specified in TABLE 4.1-C.
- 4.1.14 Prior to commencing operations of Kiln # 6, the approval holder shall report to the Director the results of the emission source monitoring as required in TABLE 4.1-C.

**TABLE 4.1-C: AIR EMISSION SOURCE MONITORING AND REPORTING
PRIOR TO COMMENCING OPERATIONS OF KILN #6**

| EFFLUENT STREAM/EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING FREQUENCY |
|---------------------------------|--|----------------|---------------------|-----------------------------|-------------------------------------|
| Clinker Cooler Stacks | <ul style="list-style-type: none"> • In-stack opacity • Temperature • Flow rate | Continuous | CEM | CEMS Code | Monthly |
| | <ul style="list-style-type: none"> • Total particulates • Temperature • Flow rate | Twice per year | Manual Stack Survey | Alberta Stack Sampling Code | One month after the survey was done |

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| EFFLUENT STREAM/ EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING FREQUENCY | |
|---|--|----------------|----------------------|--|-------------------------------------|-------------------------------------|
| | <ul style="list-style-type: none"> • PM₁₀ • PM_{2.5} | Twice per year | Manual Stack Survey | Proposed U.S. EPA Method 201A or equivalent method authorized in writing by the Director | | |
| Kiln #4 and Kiln #5 Main Stacks | <ul style="list-style-type: none"> • In-stack opacity • Sulphur dioxide • Nitrogen Oxides • Temperature • Flow rate | Continuous | CEM | CEMS Code | Monthly | |
| Kiln #4 and Kiln #5 Main Stacks | PM ₁₀ PM _{2.5} | Twice per year | Manual stack survey | Proposed U.S. EPA Method 201A or equivalent method authorized in writing by the Director | Two months after the survey is done | |
| | Heavy metals | | | U.S. EPA Method 29 or equivalent method authorized in writing by the Director | | |
| | Mercury (The specific mercury parameter(s) are under development.) | | | Limit(s) presently under development | | |
| | Total particulates | Twice per year | Manual stack survey | Alberta Stack Sampling Code | | One month after the survey was done |
| | Polycyclic aromatic hydrocarbons BTEX | Twice per year | Manual stack survey | to be verified | | Two months after the survey is done |

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| EFFLUENT STREAM/EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING FREQUENCY |
|---------------------------------|--|---|---------------------|---|--|
| Kiln #5 Main Stack | Hydrogen Chloride | Twice per year when using tires as fuel | Manual stack survey | EPA Method 26A | One month after the survey is done |
| | Polycyclic aromatic hydrocarbons | | | to be verified | |
| | Carbon monoxide | | | | |
| Kiln #4 and Kiln #5 Main Stacks | <ul style="list-style-type: none"> • <u>PM₁₀</u> • <u>PM_{2.5}</u> | <u>Twice per year</u> | Manual stack survey | <u>Proposed U.S. EPA Method 201A or equivalent method authorized in writing by the Director</u> | <u>Two months after the survey is done</u> |
| | <ul style="list-style-type: none"> • <u>Heavy metals</u> | | | <u>U.S. EPA Method 29 or equivalent method authorized in writing by the Director</u> | |
| | <ul style="list-style-type: none"> • <u>Total particulates</u> | <u>Twice per year</u> | Manual stack survey | <u>Alberta Stack Sampling Code</u> | <u>One month after the survey was done</u> |
| | <ul style="list-style-type: none"> • <u>Polycyclic aromatic hydrocarbons</u> • <u>BTEX</u> | <u>Twice per year</u> | Manual stack survey | <u>Method authorized in writing by the Director</u> | <u>Two months after the survey is done</u> |
| Kiln #5 Main Stack | <ul style="list-style-type: none"> • <u>Hydrogen Chloride</u> | <u>When using tires as precalciner fuel</u> | Manual stack survey | EPA Method 321 | One month after the survey is done |
| | <ul style="list-style-type: none"> • <u>Polycyclic aromatic hydrocarbons</u> | | | <u>Method authorized in writing by the Director</u> | |
| | <ul style="list-style-type: none"> • <u>BTEX</u> | | | | |

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| EFFLUENT STREAM/ EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING FREQUENCY |
|---|--|----------|----------------------|---|------------------------|
| | <ul style="list-style-type: none"> • Heavy metals | | | U.S. EPA Method 29 or equivalent method authorized in writing by the Director | |

4.1.15 In addition to 4.1.13, the approval holder shall conduct at least one manual stack survey each time they change the type of fuel or combination of fuel other than the existing coal supply and natural gas that is used in a year.

~~The ultimate coal analysis in TABLES 4.1-C and 4.1-F is required at the time of the stack survey when coal is used as a fuel or as a combination of fuel.~~

POST-EXPANSION OF THE PLANT

4.1.16 Upon the commencement of operations of Kiln # 6, the approval holder shall only release effluent streams to the atmosphere from the following sources:

- (a) the Kiln # 5 baghouse main exhaust stack;
- (b) the Kiln # 6 baghouse main exhaust stack;
- (c) the Raw Mill # 2 baghouse vent;
- (d) the Finish Mill # 1 baghouse vent;
- (e) the Finish Mill # 2 baghouse vent;
- (f) the VCM baghouse ~~vent~~exhaust stack;
- (g) all the other plant baghouses specified in the Table PE-2 titled Plant Post Expansion Small Baghouses submitted with application number 015-1702;
- (h) the ~~two~~three diesel-fired emergency electrical generators exhaust stacks; and
- (i) the aqueous ammonia storage tank(s) pressure safety valve(s).

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4.1.17 Upon commencing of operations of Kiln # 6, the approval holder shall maintain the following stacks according to the minimum height requirements in TABLE 4.1-D.

TABLE 4.1-D: STACK HEIGHTS UPON COMMENCING OPERATIONS OF KILN # 6

| STACK | MINIMUM HEIGHT ABOVE GRADE (metres) |
|--------------------------------------|-------------------------------------|
| Kiln # 5 main exhaust stack | 90.1 |
| Kiln # 6 baghouse main exhaust stack | 132.0 |
| VCM baghouse exhaust stack | 32.9 |

4.1.18 Upon commencing operations of Kiln # 6, the approval holder shall:

- (a) collect; and
- (b) direct:
 - (i) the main effluent stream from Kiln #5 to:
 - (A) the SNCR system; and then to
 - (B) the FGD system; and then to
 - (C) the Kiln # 5 baghouse; and then to
 - (D) the Kiln #5 main stack;
 - (ii) the effluent stream from Kiln # 5 alkali by-pass to the Kiln # 5 electrostatic precipitator and then to the Kiln # 5 main stack,
 - (iii) the effluent stream from the Kiln # 5 clinker cooler to the Kiln # 5 baghouse and then to the Kiln # 5 main stack,
 - (iv) the effluent stream from the coal mill to the coal mill baghouse, and then to the Kiln # 5 main stack;
 - (v) the main effluent stream from Kiln # 6 to:
 - (A) the SNCR system; and then to
 - (B) the FGD system; and then to

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- (C) the Kiln # 6 VRM when operating; and then to
 - (D) the Kiln # 6 baghouse; and then to
 - (E) the Kiln # 6 main stack;
 - (vi) the effluent stream from Kiln # 6 alkali by-pass to the associated baghouse and then to the Kiln # 6 main stack,
 - (vii) the effluent stream from the Kiln # 6 clinker cooler to the VRM and then to Kiln # 6 baghouse and then to the Kiln # 6 main stack,
 - (viii) the effluent streams from the following sources to their associated baghouses, as described in the application:
 - (A) Raw Mill # 2;
 - (B) Finish Mills #s 1 and 2; and
 - (C) VCM;
 - (ix) the effluent streams from all other processing, handling and storage facilities to all the other plant baghouses specified in the Table PE-2 titled Plant Post- Expansion Small Baghouses submitted with application number 015-1702.
- 4.1.19 The approval holder shall manage the dustmaterial collected in the air pollution abatement equipment by:
- (a) recycling the dustmaterial back into the cement manufacturing process; or
 - (b) selling the dustmaterial as a product; or
 - (c) disposing of the dust-ofmaterial in the CKD landfill, if the material is CKD.
- 4.1.20 In addition to the limits specified in 4.1.2523 and upon commencing operations of Kiln # 6, the approval holder shall not operate the process equipment unless and until the following pollution abatement equipment associated with the process equipment is operating:
- (a) the Kiln # 5 baghouse;
 - (b) the Kiln # 5 alkali by-pass electrostatic precipitator;
 - (c) the Kiln # 6 baghouse;

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- (d) the Kiln # 6 alkali by-pass baghouse;
- (e) the Kiln #5 FGD system;
- (f) the Kiln # 5 SNCR system;
- (g) the Kiln # 6 FGD system;
- (h) the Kiln # 6 SNCR system;
- (i) the Raw Mill # 2 baghouse;
- (j) the Finish Mill # 1 baghouse;
- (k) the Finish Mill # 2 baghouse;
- (l) the VCM baghouse;
- (m) the Coal mill baghouse;
- (n) aqueous ammonia storage tank pressure safety valve; and
- (o) all the other plant baghouses specified in the Table PE-2 titled Plant Post Expansion Small Baghouses submitted with application number 015-1702.

4.1.21 Upon commencing operations of Kiln # 6, the approval holder must retain the full capability to use natural gas as fuel in the following:

- (a) Kiln # 5; and
- (b) Kiln # 6.

AIR LIMITS POST-EXPANSION OF THE PLANT

4.1.22 Upon commencing operations of Kiln # 6, releases of the following substances to the atmosphere shall not exceed the limits specified in TABLE 4.1-E.

TABLE 4.1-E: STACK EMISSION LIMITS UPON COMMENCING OPERATIONS OF KILN # 6

| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION |
|-----------------|-----------|--|
|-----------------|-----------|--|

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | | |
|-----------------------------|--------------------|---|---|--|
| Kiln # 5 Main Exhaust Stack | Sulphur Dioxide | 183.8 tonnes kg per hour (Effective upon commencing operations of Kiln # 6) | 165.4 tonnes kg per hour (Effective two years <u>12 months</u> after of Kiln # 6 has commenced operations) | 147 tonnes kg per hour (Effective four years <u>30 months</u> after of Kiln # 6 has commenced operations) |
| | | 91.4 tonnes kg per hour based on a 720 hourly rolling average (Effective upon commencing operations of Kiln # 6) | 82.3 tonnes kg per hour based on a 720 hourly rolling average (Effective two years <u>12 months</u> after of Kiln # 6 has commenced operations) | 73.1 tonnes kg per hour based on a 720 hourly rolling average (Effective four years <u>30 months</u> after of Kiln # 6 has commenced operations) |
| | Oxides of Nitrogen | 399.0 kg per hour (Effective upon commencing operations of Kiln # 6) | x tonnes <u>279.0 kg</u> per hour (Effective two months after commencing <u>Kiln # 6 has commenced</u> operations of Kiln # 6) | |
| | | 241.3 <u>315.0</u> kg per hour based on a 720 hourly rolling average (Effective upon commencing operations of Kiln # 6) | 488.4 tonnes <u>287.0 kg</u> per hour based on a 720 hourly rolling average (Effective two months after commencing <u>Kiln # 6 has commenced</u> operations of Kiln # 6) | |
| | Particulate | 0. xxx <u>06</u> g of particulate per kg of effluent | | |

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| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | | |
|-----------------------------|---|---|---|--|
| | Heavy Metals Heavy Metals <ul style="list-style-type: none"> • Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc) • Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium) • Class III (the sum of cadmium, mercury and thallium) | Class I: 1.5 mg/m ³ Class II: 0.5 mg/m ³ Class III: 0.15 mg/m ³ | | |
| | Mercury (The specific mercury parameter(s) are under development.) | Limit(s) presently under development | | |
| Kiln # 6 Main Exhaust Stack | Sulphur-Dioxide | X tonnes per hour (Effective upon commencing operations of Kiln # 6) | X tonnes per hour (Effective two years after of Kiln # 6 has commenced operations) | X tonnes per hour (Effective four years after of Kiln # 6 has commenced operations) |
| | | 178.6 tonnes per hour based on a 720 hourly rolling average (Effective upon commencing operations of Kiln # 6) | 160.7 tonnes per hour based on a 720 hourly rolling average (Effective two years after of Kiln # 6 has commenced operations) | 142.8 tonnes per hour based on a 720 hourly rolling average (Effective four years after of Kiln # 6 has commenced operations) |
| | Oxides of Nitrogen | X tonnes per hour (Effective upon commencing operations of Kiln # 6) | X tonnes per hour (Effective two months after commencing operations of Kiln # 6) | |
| | | xx tonnes per hour based on a 720 hourly rolling average (Effective upon commencing operations of Kiln # 6) | 183.8 tonnes per hour based on a 720 hourly rolling average (Effective two months after commencing operations of Kiln # 6) | |
| Particulates | 0.xxx g of particulate per kg of effluent | | | |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | | |
|-----------------------------|---|--|---|---|
| | Heavy Metals Heavy Metals Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc) Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium) Class III (the sum of cadmium, mercury and thallium) | Class I: 1.5 mg/m ³ Class II: 0.5 mg/m ³ Class III: 0.15 mg/m ³ | | |
| | Mercury (The specific mercury parameter(s) are under development.) | Limit(s) presently under development | | |
| Plant Total | Sulphur Dioxide | 498.8 tonnes per quarter year (Effective upon commencing operations of Kiln # 6) | 450 tonnes per quarter year (Effective two years after of Kiln # 6 has commenced operations) | 400 tonnes per quarter year (Effective two years after of Kiln # 6 has commenced operations) |
| Kiln # 6 Main Exhaust Stack | Sulphur Dioxide | <u>343.8 kg per hour when the VRM is on</u> (Effective upon commencing operations of Kiln # 6) | <u>309.4 kg per hour when the VRM is on</u> (Effective 12 months after Kiln # 6 has commenced operations) | <u>275.0 kg per hour when the VRM is on</u> Effective 30 months after Kiln # 6 has commenced operations) |
| | | <u>627.5 kg per hour when the VRM is off</u> (Effective upon commencing operations of Kiln # 6) | <u>564.8 kg per hour when the VRM is off</u> (Effective 12 months after Kiln # 6 has commenced operations) | <u>502 kg per hour when the VRM is off</u> Effective 30 months after Kiln # 6 has commenced operations) |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| EMISSION SOURCE | SUBSTANCE | MAXIMUM EMISSION RATE OR CONCENTRATION | | |
|--------------------|---|--|--|---|
| | | <u>178.6 kg per hour based on a 720 hourly rolling average</u> (Effective upon commencing operations of Kiln # 6) | <u>160.7 kg per hour based on a 720 hourly rolling average</u> (Effective 12 months after Kiln # 6 has commenced operations) | <u>142.8 kg per hour based on a 720 hourly rolling average</u> (Effective 30 months after Kiln # 6 has commenced operations) |
| | <u>Oxides of Nitrogen</u> | <u>363 kg per hour</u> (Effective upon commencing operations of Kiln # 6) | <u>272.6 kg per hour</u> (Effective two months after Kiln # 6 has commenced operations) | |
| | | <u>287 kg per hour based on a 720 hourly rolling average</u> (Effective upon commencing operations of Kiln # 6) | <u>215.0 kg per hour based on a 720 hourly rolling average</u> (Effective two months after Kiln # 6 has commenced operations) | |
| | <u>Particulates</u> | <u>0.06 g of particulate per kg of effluent</u> | | |
| | <u>Heavy Metals Heavy Metals</u> <ul style="list-style-type: none"> • <u>Class I (the sum of antimony, copper, lead, manganese, vanadium and zinc)</u> • <u>Class II (the sum of arsenic, chromium, cobalt, nickel, selenium and tellurium)</u> • <u>Class III (the sum of cadmium, mercury and thallium)</u> | <u>Class I: 1.5 mg/m³</u> <u>Class II: 0.5 mg/m³</u> <u>Class III: 0.15 mg/m³</u> | | |
| <u>Plant Total</u> | <u>Sulphur Dioxide</u> | <u>498 tonnes per quarter year</u> (Effective upon commencing operations of Kiln # 6) | <u>450 tonnes per quarter year</u> (Effective 12 months after Kiln # 6 has commenced operations) | <u>400 tonnes per quarter year</u> (Effective 30 months after Kiln # 6 has commenced operations) |

4.1.23 Upon commencing operations of Kiln # 6, the approval holder shall monitor the emission sources as specified in TABLE 4.1-F.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

- 4.1.24 Upon commencing operations of Kiln # 6, the approval holder shall report to the Director the results of the emission source monitoring as required in TABLE 4.1-F.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

**TABLE 4.1-F-: AIR EMISSION SOURCE MONITORING AND REPORTING
UPON COMMENCING OPERATIONS OF KILN # 6**

| EFFLUENT STREAM/ EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING FREQUENCY |
|---|---|----------------|---------------------------|--|---|
| Kiln # 5 and Kiln # 6 Main Stacks | <ul style="list-style-type: none"> • In-stack opacity • Sulphur dioxide • Nitrogen Oxide • Temperature • Flow rate | Continuous | CEM | CEMS Code | Monthly |
| Kiln # 5 and Kiln # 6 Main Stacks | PM ₁₀ PM _{2.5} | Twice per year | Manual stack survey | U.S. EPA Method 201A or equivalent method authorized in writing by the Director | Two months after the survey is done |
| | Heavy metals | | | U.S. EPA Method 29 or equivalent method authorized in writing by the Director | |
| | Mercury (The specific mercury parameter(s) are under development.) | | | to be verified | |
| | Total particulates | | | Twice per year | |
| † | sulphur Net heating value | grab | Ultimate coal analysis | to be verified | |
| Kiln # 5 and Kiln # 6 Main Stacks | Hydrogen Chloride | Twice per year | Manual stack survey | Alberta Stack Sampling Code | Month after the survey is done |
| | Polycyclic aromatic hydrocarbons | | | | |
| | Carbon monoxide | | | | |
| | BTEX | | | | |
| | Heavy metals | | | | |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

EVALUATION OF MERCURY CEMS

~~The approval holder shall submit a written Mercury CEMS Monitoring proposal to the Director for monitoring mercury emissions from Kiln # 6, within one year of commencing operations of Kiln # 6.~~

~~The Mercury CEMS Monitoring proposal in 4.1.27 shall include, at a minimum, all of the following:~~

~~the make and model of the mercury CEMS;~~

~~the rationale for the selection of the mercury CEMS;~~

~~the design and performance specifications of the mercury CEMS;~~

~~the reference method of analysis;~~

~~the required technical support and training; and~~

~~the implementation schedule.~~

~~The approval holder shall correct all deficiencies in the Mercury CEMS Monitoring proposal as outlined in writing by the Director by the deadline specified in writing by the Director.~~

~~The approval holder shall implement the Mercury CEMS Monitoring proposal as authorized in writing by the Director.~~

~~The approval holder shall monitor the emissions from the Kiln # 6 main stack for the parameters as specified TABLE 4.1-G.~~

~~The approval holder shall report to the Director the results of the emission source monitoring as required in TABLE 4.1-G.~~

TABLE 4.1-G MERCURY AIR EMISSION SOURCE MONITORING AND REPORTING

| EFFLUENT STREAM/ EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING |
|---|------------------|-----------------|------------------------------|-------------------------------|------------------|
|---|------------------|-----------------|------------------------------|-------------------------------|------------------|

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| EFFLUENT STREAM/ EMISSION SOURCE | PARAMETER | SAMPLING | MONITORING METHOD | METHOD OF ANALYSIS | REPORTING |
|---|---|--|----------------------------|--|--|
| Kiln # 6 Main Stack | Total Vapour Phase Mercury Elemental Vapour Phase Mercury Oxidized Vapour Phase Mercury | Continuous for 12 months after the GEMS has been certified | GEM | Method authorized in writing by the Director | Monthly |
| Kiln # 5 and Kiln # 6 Main Stacks | <ul style="list-style-type: none"> • <u>PM₁₀</u> • <u>PM_{2.5}</u> | <u>Twice per year</u> | <u>Manual stack survey</u> | <u>U.S. EPA Method 201A or equivalent method authorized in writing by the Director</u> | <u>Two months after the survey is done</u> |
| | <ul style="list-style-type: none"> • <u>Heavy metals</u> | | | <u>U.S. EPA Method 29 or equivalent method authorized in writing by the Director</u> | |
| | <ul style="list-style-type: none"> • <u>Total particulates</u> | <u>Twice per year</u> | <u>Manual stack survey</u> | <u>Alberta Stack Sampling Code</u> | <u>One month after the survey was done</u> |
| Kiln # 5 Main Stack | <ul style="list-style-type: none"> • <u>Hydrogen Chloride</u> | <u>when using tires as fuel</u> | <u>Manual stack survey</u> | <u>EPA Method 321</u> | <u>Month after the survey is done</u> |
| | <ul style="list-style-type: none"> • <u>Polycyclic aromatic hydrocarbons</u> | | | <u>Method authorized in writing by the Director</u> | |
| | <ul style="list-style-type: none"> • <u>BTEX</u> | | | <u>U.S. EPA Method 29 or equivalent method authorized in writing by the Director</u> | |
| | <ul style="list-style-type: none"> • <u>Heavy metals</u> | | | | |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

KILN # 6 MERCURY MASS BALANCE ASSESSMENT PLAN

- 4.1.25 The approval holder shall submit a written Kiln # 6 Mercury Mass Balance Assessment Plan to the Director no later than April 1, 2012 to determine:
- (a) the mercury content of the raw materials, products, by-products and stack gases;
 - (b) the behaviour, fate and distribution of mercury within the cement manufacturing process; and
 - (c) the effectiveness of the proposed mercury abatement technology, as described in the application, to reduce mercury emissions from the plant.
- 4.1.26 The approval holder shall implement the Kiln # 6 Mercury Mass Balance Assessment Plan:
- (a) within one year of commencing operations; and
 - (b) subject to the revisions pursuant to 4.1.27.
- 4.1.27 If the submitted Kiln # 6 Mercury Mass Balance Assessment Plan is found deficient by the Director, the approval holder shall:
- (a) correct all the deficiencies as outlined in writing by the Director, by the deadline specified in writing by the Director; and
 - (b) implement any revisions to the Kiln # 6 Mercury Mass Balance Assessment Plan as authorized in writing by the Director.
- 4.1.28 The Mercury Mass Balance Assessment Plan shall include, at a minimum all of following:
- (a) the design of the assessment;
 - (b) the rationale for the proposed assessment design and a detailed discussion of other assessment methods considered;
 - (c) measurement of all mercury inputs and outputs to the Kiln # 6 cement manufacturing process;
 - (d) sampling protocol for each material, process and emission streams including the following;

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- (i) methods of analysis and detection limits,
 - (ii) duration and frequency of sampling, and
 - (iii) laboratory quality control and quality assurance;
 - (e) implementation schedule; and
 - (f) any other information required by the Director.
- 4.1.29 The approval holder shall submit a Mercury Mass Balance Assessment Plan Report to the Director as specified in writing by the Director.
- 4.1.30 The Mercury Mass Balance Assessment Plan Report shall include, at a minimum, all of the following:
- (a) a summary and interpretation of the data collected;
 - (b) a description of the behaviour and distribution of mercury within the cement manufacturing process;
 - (c) the mercury mass balance calculations;
 - (d) the mercury removal efficiency of the proposed mercury abatement technology as described in the application;
 - (e) recommendations, as follows:
 - (i) for additional monitoring to further evaluate the behaviour, fate and distribution of mercury within the cement manufacturing process, and
 - (ii) for additional means to reduce mercury emissions from the plant; and
 - (f) any other information required by the Director.

KILN AND PRECALCINER FUEL

- 4.1.31 The approval holder shall only use natural gas, coal or a combination of natural gas and coal or tires as kiln and precalciner fuel as authorized in this approval.

WHEN USING COAL AS KILN AND PRECALCINER FUEL

~~The approval holder shall only use coal as precalciner and kiln fuel that complies with the coal quality limits in TABLE 4.1-H.~~

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.1-H COAL QUALITY LIMITS

| PARAMETER | MONTHLY AVERAGE LIMIT (as determined basis) |
|-------------------|--|
| Sulphur Content | Maximum of 0.55 weight % |
| Net Heating Value | Minimum of 18.38 MJ/kg |

4.1.32 The approval holder shall only transport coal to the plant using enclosed truck trailers as described in the application number 015-1702 and trailer combinations, unless otherwise authorized in writing by the Director.

WHEN USING TIRES AS KILN #5 PRECALCINER FUEL

4.1.33 Notwithstanding 4.1.32, the approval holder shall not use tires as:

- (a) kiln fuel for the main burner in each of Kiln # 4, Kiln # 5 or Kiln # 6 precalciner; and
- (b) kiln fuel in Kiln # 6.

4.1.34 The approval holder shall only store tires:

- (a) in a truck trailer; or
- (b) as authorized in writing by the Director.

4.1.35 The approval holder shall not exceed the limits specified in TABLE 4.1-I when tires are used as fuel in the Kiln # 5 precalciner.

TABLE 4.1-I: TIRE FUEL OPERATING LIMITS

| Parameter | Limit |
|---------------------------|--|
| Tire Feed Rate | <ul style="list-style-type: none"> • 50 kg/min • Not more than 20% of the total heat input into the kiln |
| Tire Storage at the Plant | <ul style="list-style-type: none"> • Not more than 15,000 at any time |

4.1.36 The approval holder shall immediately cease feeding tires into Kiln # 5 precalciner for fuel, if any of the following occurs:

- (a) the alkali by-pass electrostatic precipitator or the kiln baghouse fails; or

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- (b) the temperature of the effluent stream exiting the precalciner is 800 C or lower; or
- (c) the temperature sensor or the recording device for the temperature sensor for 4.1.2638 (b) fails; or
- (d) the oxygen content of the effluent stream in the preheater downcomer is less than 1%; or
- (e) the oxygen control sensor or the recording device for oxygen content sensor for 4.1.26 (f)d) fails.

4.1.37 The approval holder shall monitor the plant operating conditions as required in TABLE 4.1-J, whenever tires are being used as fuel in Kiln # 5 precalciner.

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4.1.38 The approval holder shall report to the Director as prescribed in TABLE 4.1-J, whenever tires are being used as fuel in Kiln # 5 precalciner.

**TABLE 4.1-J: AIR EMISSION SOURCE MONITORING AND REPORTING
WHEN USING TIRES FOR FUEL**

| Location | Parameter | Measuring Frequency | Measurement Method | Reporting Frequency |
|--|--------------------------------|---------------------|--------------------|---------------------|
| Natural Gas Metering | Full Usage | Continuous | Natural gas meter | Monthly |
| Coal | Full Usage | Continuous | Meter | |
| Tire Charging System | Tire Charging Rate (tires/min) | Continuous | Count | |
| Precalciner Exit | Temperature | Continuous | Thermocouple | |
| Preheater Downcomer Preheater Downcomer | Oxygen concentration — | Continuous | CEM | |
| Tire Storage Area | # of tires at month end | Monthly | Count or estimate | |

MONITORING AND REPORTING

AMBIENT AIR MONITORING AND REPORTING

4.1.39 The approval holder shall monitor ambient levels of the parameters in the manner specified in TABLE 4.1-K.

~~The approval holder shall report to the Director the results of the ambient air quality monitoring as required in TABLE 4.1-K.~~

~~TABLE 4.1-K: AMBIENT AIR MONITORING AND REPORTING~~

| Monitoring Station | Parameter | Frequency | Method of Analysis | Reporting Frequency |
|--------------------|-----------|-----------|--------------------|---------------------|
|--------------------|-----------|-----------|--------------------|---------------------|

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| | | | | |
|--|--|-------------|---|--|
| Exhaust Ambient Air Monitoring Station | Sulphur dioxide Nitrogen oxides Total particulates PM _{2.5} PM ₁₀ Wind speed, and direction Temperature Barometric pressure Relative humidity | Continuous | | |
| Three Fugitive Dust Ambient Air Monitoring Stations 1 background station located west of the plant; and 2 downwind stations located on the eastern boundary of the plant site | Effective November 1, 2009 Total particulates PM _{2.5} | As per NAPS | Air Monitoring Directive and methods authorized in writing by the Director | |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

MONTHLY AIR EMISSIONS SUMMARY REPORT

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.1.40 The approval holder shall report to the Director the results of the ambient air quality monitoring as required in TABLE 4.1-K.

TABLE 4.1-K: AMBIENT AIR MONITORING AND REPORTING

| <u>Monitoring Station</u> | <u>Parameter</u> | <u>Frequency</u> | <u>Method of Analysis</u> |
|--|--|--------------------|---|
| <u>Exshaw Ambient Air Monitoring Station</u> | <ul style="list-style-type: none"> • <u>Sulphur dioxide</u> • <u>Nitrogen oxides</u> • <u>Total particulates</u> • <u>PM_{2.5}</u> • <u>PM₁₀</u> • <u>Wind speed, and direction</u> • <u>Temperature</u> • <u>Barometric pressure</u> • <u>Relative humidity</u> | <u>Continuous</u> | |
| <u>Three Particulate Matter Ambient Air Monitoring Stations</u> <ul style="list-style-type: none"> • <u>one background station located west of the plant; and</u> • <u>two downwind stations located on the eastern boundary of the plant site</u> | <u>Effective November 1, 2009</u> <ul style="list-style-type: none"> • <u>Total suspended particulates</u> • <u>PM_{2.5}</u> | <u>As per NAPS</u> | <u>Air Monitoring Directive and methods authorized in writing by the Director</u> |
| <u>One Meteorological station located as authorized in writing by the Director</u> | <u>Effective November 1, 2009</u> <ul style="list-style-type: none"> • <u>Wind speed, and direction</u> • <u>Temperature</u> • <u>Barometric pressure</u> • <u>Relative humidity</u> • <u>Precipitation</u> | <u>Continuous</u> | <u>Methods as authorized in writing by the Director</u> |

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- 4.1.41 The approval holder shall only relocate the particulate matter ambient air monitoring stations specified in TABLE 4.1-K as authorized in writing by the Director.

MONTHLY AIR EMISSIONS SUMMARY REPORT

- 4.1.42 In addition to the monthly reporting in TABLES 4.1-C, 4.1-F, 4.1-G, 4.1-J and 4.1-K the approval holder shall submit a Monthly Air Emissions Summary Report to the Director, on or before the end of the month following the month in which the information was collected.
- 4.1.43 The Monthly Air Emissions Summary Report referred to in 4.1.42 shall include, at a minimum, the following:
- (a) an assessment of the performance of the air emissions control and monitoring;
 - (b) the monitoring results collected in accordance with TABLES 4.1-C, 4.1-F, 4.1-G, 4.1-J and 4.1-K;
 - (c) the results of any manual stack surveys;
 - (d) the results of continuous emission monitoring;
 - (e) the percent time that each continuous emission monitor was operational;
 - (f) an assessment of the emissions of air contaminants from the plant relative to the limits specified in TABLES 4.1-B, 4.1-E, 4.1-H, 4.1-I;
 - (g) the data collected from the ambient air monitoring stations;
- an assessment of the ambient air monitoring data relative to the Alberta Ambient Air Quality Objectives, as amended
- ~~the amount of clinker produced;~~
- ~~a summary of the kilns and precalciners fuel use including the following:~~
- ~~the type of fuel;~~
 - ~~the quantities of each fuel type used; and~~
 - (h) ~~the date and time period, when each fuel type was used;~~

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- (i) a summary of contraventions reported pursuant to 2.1.1; and
- (j) any other information requested by the Director.

ANNUAL AIR EMISSIONS SUMMARY REPORT

4.1.44 The approval holder shall submit an Annual Air Emissions Summary Report to the Director, on or before March 31 of the year following the year in which the information was collected.

4.1.45 The Annual Air Emissions Summary Report in 4.1.4544 shall include, at a minimum, the following:

- (a) an assessment of the performance of the air emissions control and monitoring;
- (b) the monitoring results collected in accordance with TABLES 4.1-C, 4.1-F, 4.1-G, 4.1-J and 4.1-K;
- (c) the results of any manual stack surveys;
- (d) the results of continuous emission monitoring;
- (e) the percent time that each continuous emission monitor was operational;
- (f) the calculated yearly emission rates of particulates and nitrogen oxides;
- (g) the sulphur dioxide emissions for each quarter year period;
- (h) an assessment of the emissions of air contaminants from the plant relative to the limits specified in TABLES 4.1-B, 4.1-E, 4.1-H, 4.1-I;
- (i) the data collected from the ambient air monitoring stations;
- (j) an assessment of the ambient air monitoring data relative to the *Alberta Ambient Air Quality Objectives*, Alberta Environment, June 2008, as amended;
- (k) the amount of clinker produced;
- (l) a summary of the fuel used in the kilns and precalciners ~~fuel use~~ including the following:

the type of fuel;

- (i) .

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- (ii) the quantities of each fuel type used; and
- (iii) the date and time period when each fuel type was used;
- (m) a summary of tires stored on site;
- (n) the Annual Fugitive Dust Control Best Management Practices Program Summary Report;
- (o) the Annual Plant Noise Mitigation and Control Summary Report;
- (p) a summary of contraventions reported pursuant to 2.1.1; and
- (q) any other information requested by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

FUGITIVE DUST MANAGEMENT

- 4.1.46 Effective **September 1, 2009**, the approval holder shall implement the fugitive dust management measures as specified in the document Lafarge ~~North America~~Exshaw Plant EPEA Approval Application No. 015-1702 Fugitive Dust Control Best Management Practices - Program, ~~February~~April 2009, as amended, forming part of the application number 015-1702.
- 4.1.47 Commencing January 1, 2010, the Fugitive Dust Control Best Management Practices Program document referred to in 4.1.~~4946~~, shall include, at a minimum, all of the following information:
- (a) potential fugitive dust sources;
 - (b) control methodologies and frequency;
 - (c) performance guidelines;
 - (d) types, methods and frequency of:
 - (i) inspections, and
~~Monitoring;~~
 - (ii) monitoring;
 - (e) inspection forms;
 - (f) inspection and monitoring records;
 - (g) training requirements and frequency; and
 - (h) performance evaluation description and frequency.
- 4.1.48 The approval holder shall:
- (a) review the Fugitive Dust Control Best Management Practices Program document annually at a minimum; and
 - (b) update the Fugitive Dust Control Best Management Practices Program document annually, at a minimum.

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- 4.1.49 The approval holder shall submit to the Director an up-to-date Fugitive Dust Control Best Management Practices Program document, when requested in writing by the Director.
- 4.1.50 Effective ~~May~~**June 1, 2010**, the approval holder shall submit an Annual Fugitive Dust Control Best Management Practices Program Summary report to the Director before March 31st of the year following the report year.
- 4.1.51 The Annual Fugitive Dust Control Best Management Practices Program Summary Report shall include, at a minimum, all of the following information:-
- (a) an evaluation of the performance of the fugitive dust management and control program;
 - (b) a copy of the performance reports;
 - (c) revisions to the Fugitive Dust Control Best Management Practices;
 - (d) a record of fugitive dust public complaints and a description of remedial measures taken; and
 - (e) any other information requested by the Director.
- 4.1.52 The Annual Fugitive Dust Control Best Management Practices Program Summary Report referred in 4.1.~~5350~~ **and 4.1.51** shall be included in the Annual Air Emissions Summary Report.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PLANT NOISE MITIGATION AND CONTROL REPORTING

- 4.1.53 Effective ~~May~~June 1, 2010, the approval holder shall submit an Annual Plant Noise Mitigation and Control -Summary ~~report~~Report to the Director before March 31st of the year following the report year.
- 4.1.54 The Annual Plant Noise Mitigation and Control -Summary ~~report~~Report referred to in 4.1.~~54~~53 shall include, at a minimum, the following:
- (a) the results of full noise surveys conducted by third party consultants to verify improvements or compliance to the Directive. 38 Noise Control, Energy Resources Conservation Board, February 16, 2007, as amended;
 - (b) a summary of noise measurements taken throughout the community by plant personnel to verify plant noise reduction improvements;
 - (c) a record of noise complaints and a description of remedial measures taken;
 - (d) a summary of noise measurements resulting from improvements made to equipment at the plant; and
 - (e) any other information required by the Director.
- 4.1.55 The Annual Plant Noise Mitigation and Control Summary ~~report~~Report referred in 4.1.~~56~~53 and 4.1.54 shall be included in the Annual Air Emissions Summary ~~report~~Report.

SECTION 4.2: INDUSTRIAL WASTEWATER

OPERATIONS

- 4.2.1 The approval holder shall not release any substances from the plant to the surrounding watershed except as authorized by this approval.
- 4.2.2 Industrial wastewater shall be managed as described in application number 015-1702, unless otherwise authorized in writing by the Director.
- 4.2.3 The approval holder shall only release industrial wastewater from the Quarry Garage to a wastewater treatment facility which holds a current Approval or Registration under the Act.
- 4.2.4 The approval holder shall only wash vehicles inside the Quarry Garage.

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- 4.2.5 All industrial runoff from the plant developed area shall be directed to the Industrial Runoff Sedimentation Pond.
- 4.2.6 The approval holder shall only make or permit a release from the Industrial Runoff Sedimentation Pond at the discharge point specified in Figure 9.5-3. Volume II: Environmental Screening Report, Section 9. Surface Water forming part of application number 015-1702.

PRE-EXPANSION OF THE PLANT

- 4.2.7 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, the approval holder shall only release the non-contact cooling water stream to the Industrial Runoff Sedimentation Pond.
- 4.2.8 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, the approval holder shall not add chemicals to the non-contact cooling water.
- 4.2.9 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, the approval holder shall only release non-contact cooling water and industrial runoff from the Industrial Runoff Sedimentation Pond via a pipeline to Exshaw Creek.

LIMITS - PRE-EXPANSION OF THE PLANT

- 4.2.10 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, releases from the Industrial Runoff Sedimentation Pond shall not exceed the limits for the parameters specified in TABLE 4.2-A.

TABLE 4.2-A: ~~INDUSTRIAL RUNOFF SEDIMENTATION POND LIMITS PRIOR TO COMMENCING OPERATIONS OF~~ KILN # 6 THE ZERO WATER DISCHARGE PROJECT

| PARAMETER | LIMITS | |
|---|--|-------------------------------------|
| INDUSTRIAL RUNOFF SEDIMENTATION POND | | |
| | MASS IN KILOGRAMS PER DAY (unless otherwise specified) | |
| | Maximum Daily Average (for any month) | Maximum Daily Concentration in mg/L |
| Chemical Oxygen Demand | 150 | 50 |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| | | |
|-------------------------|---|----|
| Total Suspended Solids | 100 | 30 |
| pH | 6.0 - 9.5 pH units | |
| Floating solids | Must not be present except in trace amounts | |
| Visible foam | | |
| Oil or other substances | Must not be present in amounts sufficient to create a visible film or sheen | |

MONITORING AND REPORTING – PRE-EXPANSION OF THE PLANT

- 4.2.11 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, the approval holder shall monitor the Industrial Runoff Sedimentation Pond releases as required in TABLE 4.2-B.
- 4.2.12 Prior to commencing operations of ~~Kiln # 6~~ the Zero Water Discharge Project, the approval holder shall report to the Director the results of the Industrial Runoff Sedimentation Pond monitoring as required in TABLE 4.2-B.
- 4.2.13 For the purpose of Table 4.2-B:
- (a) sampling location A is in the Sampler Building specified in Figure 9.5-3. Volume II: Environmental Screening Report, Section 9. Surface Water forming part of the application number 015-1702.

TABLE 4.2-B: ~~INDUSTRIAL RUNOFF SEDIMENTATION POND MONITORING AND REPORTING PRIOR TO COMMENCING OPERATIONS OF KILN # 6~~ THE ZERO WATER DISCHARGE PROJECT

| MONITORING | | | | REPORTING | | |
|---|------------------|---------------------|-------------------|-----------|----------|---------|
| Parameter, Test, Event, Study Proposal or Reporting Requirement | Frequency | Sample Type | Sampling Location | Monthly | Annually | Special |
| Flow (m ³ /d) | Daily | Totalizer | A | } | | |
| Chemical Oxygen Demand (in kg/d) | Once per week | Composite | A | | | |
| Total Suspended Solids (in kg/d) | Three times/week | Composite | A | | | |
| pH | Three times/week | Composite | A | | | |
| Temperature (in degrees centigrade) daily average | Continuous | Temperature Monitor | | | | |
| Floating Solids | Three times/week | Visual | A | | | |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| <u>Visible Foam</u> | <u>Three times/week</u> | <u>Visual</u> | <u>A</u> | |
|--|-------------------------|----------------------------|--------------------------|--|
| <u>Oil or other substances</u> | <u>Three times/week</u> | <u>Visual</u> | <u>A</u> | |
| MONITORING | | | | |
| <u>Parameter, Test, Event, Study Proposal or Reporting Requirement</u> | <u>Frequency</u> | <u>Sample Type</u> | <u>Sampling Location</u> | |
| <u>Flow (m³/d)</u> | <u>Daily</u> | <u>Totalizer</u> | <u>A</u> | |
| <u>Chemical Oxygen Demand (in mg/L and kg/day)</u> | <u>Once per week</u> | <u>Composite</u> | <u>A</u> | |
| <u>Total Suspended Solids (in mg/L and kg/day)</u> | <u>Three times/week</u> | <u>Composite</u> | <u>A</u> | |
| <u>pH</u> | <u>Three times/week</u> | <u>Composite</u> | <u>A</u> | |
| <u>Temperature (in degrees centigrade) daily average</u> | <u>Continuous</u> | <u>Temperature Monitor</u> | | |
| <u>Floating Solids</u> | <u>Three times/week</u> | <u>Visual</u> | <u>A</u> | |
| <u>Visible Foam</u> | <u>Three times/week</u> | <u>Visual</u> | <u>A</u> | |
| <u>Oil or other substances</u> | <u>Three times/week</u> | <u>Visual</u> | <u>A</u> | |

POST- EXPANSION OF THE PLANT

- 4.2.14 Upon commencing operations of Kiln # 6the Zero Water Discharge Project, the approval holder shall not release non-contact cooling water to the Industrial Runoff Sedimentation Pond.

- 4.2.15 Upon commencing operations of Kiln # 6the Zero Water Discharge Project, the approval holder shall only release industrial runoff from the Industrial Runoff Sedimentation Pond via a pipeline to Exshaw Creek.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

LIMITS - POST-EXPANSION OF THE PLANT

4.2.16 Upon commencing operations of Kiln # 6 Zero Water Discharge Project, releases from the Industrial Runoff Sedimentation Pond shall not exceed the limits for the parameters specified in TABLE 4.2-C.

TABLE 4.2-C:— INDUSTRIAL RUNOFF SEDIMENTATION POND LIMITS UPON COMMENCING OPERATIONS OF KILN # 6 THE ZERO WATER DISCHARGE PROJECT

| PARAMETER | LIMITS | |
|---|---|--|
| INDUSTRIAL RUNOFF SEDIMENTATION POND | | |
| | <u>MASS IN KILOGRAMS PER DAY</u> <u>Maximum Daily Concentration in mg/L</u> (unless otherwise specified) | |
| | <u>Maximum Daily Average (for any month)</u> | <u>Maximum Daily Concentration in mg/L</u> |
| <u>Chemical Oxygen Demand</u> | 150 | 50 |
| <u>Total Suspended Solids</u> | 100 | 30 |
| <u>Chemical Oxygen Demand</u> | 50 | |
| <u>Total Suspended Solids</u> | 30 | |
| pH | 6.0 - 9.5 pH units | |
| Ammonia | 2 mg/L | |
| Floating solids | Must not be present except in trace amounts | |
| Visible foam | | |
| Oil or other substances | Must not be present in amounts sufficient to create a visible film or sheen | |

MONITORING AND REPORTING – POST-EXPANSION OF THE PLANT

4.2.17 Upon commencing operations of Kiln # 6, the approval holder shall monitor the Industrial Runoff Sedimentation Pond releases as required in TABLE 4.2-D.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

- 4.2.18 Upon commencing operations of Kiln # 6, the approval holder shall report to the Director the results of the Industrial Runoff Sedimentation Pond monitoring as required in TABLE 4.2-D.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.2-D:— INDUSTRIAL RUNOFF SEDIMENTATION POND MONITORING AND REPORTING UPON COMMENCING OPERATIONS OF KILN # 6 THE ZERO WATER DISCHARGE PROJECT

| MONITORING | | | | | SAMPLE LOCATION | REPORTING | |
|------------------------------------|-------------------------|----------------------------|-----------------------|---------------|------------------------|------------------|--|
| PARAMETER | PRIOR TO RELEASE | | DURING RELEASE | | | FREQUENCY | |
| | FREQUENCY | METHOD | FREQUENCY | METHOD | | | |
| Discharge Volume (m ³) | - | - | Once/day | Estimated | A | | |
| pH | Once | Representative grab sample | Once/day | grab sample | A | | |
| Chemical Oxygen Demand (mg/L) | Once | Representative grab sample | Once/week | grab sample | A | | |
| Total Suspended Solids (mg/L) | Once | Representative grab sample | Once/week | grab sample | A | | |
| Ammonia-Nitrogen (mg/L) | Once | Representative grab sample | Once/week | grab sample | A | | |
| Oil and Grease | Once | Observation | Once/day | Observation | A | | |
| Floating Solids | Once | Observation | Once/day | Observation | A | | |
| Visible Foam | Once | Observation | Once/day | Observation | A | | |

| MONITORING | | | | | SAMPLE LOCATION |
|------------------------------------|-------------------------|----------------------------|-----------------------|---------------|------------------------|
| PARAMETER | PRIOR TO RELEASE | | DURING RELEASE | | |
| | FREQUENCY | METHOD | FREQUENCY | METHOD | |
| Discharge Volume (m ³) | : | : | Once/day | Estimated | A |
| pH | Once | Representative grab sample | Once/day | grab sample | A |
| Chemical Oxygen Demand (mg/L) | Once | Representative grab sample | Once/week | grab sample | A |
| Total Suspended Solids (mg/L) | Once | Representative grab sample | Once/week | grab sample | A |
| Ammonia-Nitrogen (mg/L) | Once | Representative grab sample | Once/week | grab sample | A |
| Oil and Grease | Once | Observation | Once/day | Observation | A |

TERMS AND CONDITIONS ATTACHED TO APPROVAL

| | | | | | |
|------------------------|-------------|--------------------|-----------------|--------------------|----------|
| <u>Floating Solids</u> | <u>Once</u> | <u>Observation</u> | <u>Once/day</u> | <u>Observation</u> | <u>A</u> |
| <u>Visible Foam</u> | <u>Once</u> | <u>Observation</u> | <u>Once/day</u> | <u>Observation</u> | <u>A</u> |

MONTHLY INDUSTRIAL WASTEWATER AND INDUSTRIAL RUNOFF SUMMARY REPORT

- 4.2.19 In addition to monthly reporting in TABLES 4.2-B and 4.2-D the approval holder shall submit a Monthly Industrial Wastewater and Industrial Runoff Summary Report on or before the end of the month following the month in which the information was collected.
- 4.2.20 The Monthly Industrial Wastewater and Industrial Runoff Summary Report referred to in 4.2.19 shall include, at a minimum, all of the following information:
- (a) an assessment of the monitoring results relative to the limits in TABLES 4.2-A and 4.2-C;
 - (b) the daily mass release from the Industrial Runoff Sedimentation Pond to the Exshaw Creek of the parameters listed in TABLES 4.2-B and 4.2-~~CD~~ in kilograms per day;
 - (c) the daily minimum, maximum and average pH recorded as per TABLE 4.2-B and TABLE 4.2-D;
 - (d) an assessment of the performance of the Industrial Wastewater Control System, the Industrial Runoff Control System, pollution abatement equipment and monitoring equipment; and
 - (e) any other information as required in writing by the Director.

ANNUAL INDUSTRIAL WASTEWATER AND INDUSTRIAL RUNOFF SUMMARY REPORT

- 4.2.21 The approval holder shall submit an Annual Industrial Wastewater and Industrial Runoff Report to the Director on or before March 31 of the year following the year in which the information was collected.
- 4.2.22 The Annual Industrial Wastewater and Industrial Runoff Report referred to in 4.2.21 shall include, at a minimum, the following information:
- (a) the daily mass release from the Industrial Runoff Sedimentation Pond to the Exshaw Creek of the parameters listed in ~~TABLE 4.2-AB and 4.2-D~~ in kilograms per day;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

- (b) an assessment of the monitoring results relative to the limits in TABLES 4.2-A and 4.2-C;
- (c) the daily minimum, maximum and average pH recorded as per TABLE 4.2-B and TABLE 4.2-D;
~~the daily minimum, maximum and average pH recorded as per TABLE 4.2-B and TABLE 4.2-D;~~
- (d) an assessment of the performance of the Industrial Wastewater Control System, the Industrial Runoff Control System, pollution abatement equipment and monitoring equipment; and
- (e) any other information as required in writing by the Director.

SECTION 4.3: WASTE MANAGEMENT

OPERATIONS

- 4.3.1 Hazardous waste or hazardous recyclables stored in containers or tanks shall be stored in accordance with the *Hazardous Waste Storage Guidelines*, June 1988, Alberta Environment, as amended.
- 4.3.2 All containers and unrinsed empty containers shall be stored in the waste storage area.
- 4.3.3 All waste that is unloaded shall be immediately transferred to the waste storage area.
- 4.3.4 Wastes shall be transferred only at designated transfer areas designed to contain spills and leaks.
- 4.3.5 The approval holder shall provide and maintain an adequate aisle space between containers in the waste storage area to allow inspection, unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area. Inspection aisles shall be arranged such that each container is exposed to view from at least one side.
- 4.3.6 The approval holder shall dispose of waste generated at the plant only to facilities holding a current Approval, Registration or as otherwise authorized under the Act, or to facilities approved by a local environmental authority outside of Alberta.
- 4.3.7 Incompatible wastes shall be prevented from mixing by a dyke, berm, wall or other appropriate barrier.

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| | | | | | | | | | | | |
|-------|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |

4.3.12 The Annual Waste Management Summary Report shall be submitted to the Director by March 31 of each year following the year in which the information was collected.

CKD LANDFILL OPERATIONS

4.3.13 The approval holder shall not:

- (a) receive; or
- (b) dispose of;

any third party's waste at the CKD landfill.

4.3.14 The approval holder shall limit the boundaries of the CKD landfill to be located within 13-22-24-9 W5 and 4-27-24-9 W5M, as described in Drawing number C4608-CI-DAL-004 submitted with the application.

4.3.15 The approval holder shall limit the elevation of the CKD landfill area to 1370 metres above sea level.

4.3.16 Notwithstanding 4.3.6, the approval holder shall only dispose of the CKD generated at the plant at:

- (a) the CKD landfill; or
- (b) to facilities holding a current Approval, Registration or as otherwise authorized under the Act, or to facilities approved by a local environmental authority outside of Alberta.

4.3.17 The cement kiln dust deposited in the CKD landfill shall be conditioned and compacted as described in application number 015-1702 or as otherwise authorized in writing by the Director.

4.3.18 The approval holder shall direct all industrial run-off from the active CKD landfill area to the CKD industrial runoff control system.

4.3.19 The approval holder shall not allow run-on to enter the active CKD landfill area.

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- 4.3.20 The approval holder shall not release industrial runoff from the CKD landfill industrial runoff control system to the environment except as otherwise authorized by this approval.
- 4.3.21 The approval holder shall apply water or other dust suppressants, authorized by the Director in writing, on the active CKD landfill area and associated roads to control fugitive emissions and to prevent erosion.
- 4.3.22 The approval holder is authorized to use industrial runoff from the industrial runoff control system pond for dust suppression on the active CKD landfill area and associated roads to control fugitive emissions and to prevent erosion.
- 4.3.23 The approval holder shall inspect the CKD landfill on a monthly basis and after a major storm event to detect evidence of deterioration, and malfunctioning of the industrial control system.
- 4.3.24 The approval holder shall record and keep the following inspection information:
- (a) date of the inspection;
 - (b) name of the person who conducted the inspection;
 - (c) a list of industrial runoff system components that required maintenance and repair;
 - (d) a list of all identified operational methods and procedures deficiencies; and
 - (e) a description of the maintenance and repairs implemented.
- 4.3.25 The approval holder shall submit an Annual CKD Landfill Summary Report to the Director before March 31st of the year following the report year.
- 4.3.26 The Annual CKD Landfill Summary Report referred in 4.3.25 shall be included in the Annual Groundwater Monitoring Program Summary Report referred to in 4.6.7.

SECTION 4.4: DOMESTIC WASTEWATER

OPERATIONS

- 4.4.1 The approval holder shall only release domestic wastewater from the plant administrative office:

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- (a) to the Municipal District of Bighorn Exshaw wastewater treatment facility provided written permission from the Municipal District of Bighorn has been first obtained; or
 - (b) to a wastewater treatment facility which holds a current Approval or Registration under the Act.
- 4.4.2 The approval holder shall only release domestic wastewater from the Quarry Garage to:
- (a) the Municipal District of Bighorn Exshaw wastewater treatment facility provided written permission from the Municipal District of Bighorn has been first obtained; or
 - (b) a septic tank and field system.
- 4.4.3 The approval holder shall dispose of sludge produced by the Quarry Garage domestic wastewater collection and treatment system:
- (a) to a wastewater treatment facility holding a current Approval or Registration under the Act; or
 - (b) as otherwise authorized in writing by the Director.

SECTION 4.5: WATERWORKS

- 4.5.1 The approval holder shall supply potable water for the plant administrative building from:
- (a) groundwater from the plant high quality groundwater well; or
 - (b) a waterworks system holding a current Approval or Registration under the Act; ;
- ~~commercially available potable water for drinking purposes only.~~
- 4.5.2 Effective **November 1, 2010**, the approval holder shall only supply potable water for the Quarry Garage building from:
- (a) groundwater from the plant high quality groundwater well; or
 - (b) a waterworks system holding a current Approval or Registration under the Act; ;

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~~commercially available potable water for drinking purposes only.~~

- 4.5.3 Until one of the water pipeline from the plant high quality groundwater is constructed and operating following events occurs, the approval holder shall post signs at all raw water outlets in the Quarry Garage stating that the water is not potable water for human consumption purposes:
- (a) a water pipeline from the plant high quality groundwater well to the Quarry Garage has been constructed and in operation; or
 - (b) potable water provided from:
 - (i) the plant high quality groundwater well, or
 - (ii) a waterworks system holding a current approval or registration under the Act,

to a cistern or holding tank at the Quarry Garage for the supply of potable water in the Quarry Garage;
 - (c) a connection to a waterworks system holding a current approval or registration under the Act has been constructed and is in operation, or the supply of potable water in the Quarry Garage by October 1, 2010.

SECTION 4.6: GROUNDWATER

- 4.6.1 The approval holder shall monitor groundwater at the plant in accordance with this approval and the latest edition of the Annual Groundwater Monitoring Program Summary Report, unless otherwise authorized in writing by the Director.
- 4.6.2 The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.
- 4.6.3 All groundwater monitor wells shall be:
- (a) protected from damage; and
 - (b) locked except when being sampled; unless otherwise authorized in writing by the Director.
- 4.6.4 If a representative groundwater sample cannot be collected because the groundwater monitor well is damaged or is no longer capable of producing a representative groundwater sample:

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- (a) the groundwater monitor well shall be cleaned, repaired or replaced; and
- (b) a representative groundwater sample shall be collected and analyzed prior to the next scheduled sampling event; unless otherwise authorized in writing by the Director.

4.6.5 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

- (a) a description of purging and sampling procedures;
- (b) the static elevations, above sea level, of fluid phases in the groundwater monitor well prior to purging;
- (c) the temperature of each sample at the time of sampling;
- (d) the pH of each sample at the time of sampling; and
- (e) the specific conductance of each sample at the time of sampling.

4.6.6 The approval holder shall compile an Annual Groundwater Monitoring Program Summary Report which shall include, at a minimum, all of the following information:

- (a) a legal description of the plant and a map illustrating the plant boundaries;
- (b) a topographic map of the plant;
- (c) a description of the industrial activity and processes;
- (d) a map showing the location of all surface and groundwater users, and, a listing describing surface water and water well use details, within at least a three kilometre radius of the plant;
- (e) a general hydrogeological characterization of the region within a five kilometre radius of the plant;
- (f) a detailed hydrogeological characterization of the plant;
- (g) a geological cross-section(s) of the plant;
- (h) a map of surface drainage patterns located within the plant;
- (i) a map of groundwater monitor well locations and a description of the existing groundwater monitoring program for the plant;

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- (j) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;
- (k) analytical data recorded as required in 4.6.1 and 4.6.5;
- (l) a summary of fluid elevations recorded as required in 4.6.5(b) and an interpretation of changes in fluid elevations;
- (m) an interpretation of groundwater flow patterns;
- (n) an interpretation of the analytical results including the following:
 - (i) diagrams indicating the location of any contamination identified,
 - (ii) probable sources of contamination, and
 - (iii) the extent of contamination identified;
- (o) a summary and interpretation of the data collected since the groundwater monitoring program began including:
 - (i) control charts which indicate trends in contaminant concentrations, and
 - (ii) the migration of contaminants;
- (p) a description of the following:
 - (i) contaminated groundwater remediation techniques employed,
 - (ii) source elimination measures employed,
 - (iii) risk assessment studies undertaken, and
 - (iv) risk management studies undertaken;
- (q) a sampling schedule for the following year;
- (r) recommendations, as follows:
 - (i) for changes to the groundwater monitoring program to make it more effective, and
 - (ii) for remediation, risk assessment or risk management of contamination identified.

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- 4.6.7 The approval holder shall submit two copies of the Annual Groundwater Monitoring Program Summary Report to the Director on or before March 31 of the year following the year in which the information on which the report is based was collected, unless otherwise authorized in writing by the Director.

SECTION 4.7: SOIL

Not used at this time.

PART 5: RECLAMATION

SECTION 5.1: KILN # 1, KILN # 2 AND KILN # 3 DECOMMISSIONING WORK PLAN

- 5.1.1 The approval holder shall submit to the Director a written Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning Work Plan proposal by **September 1, 2009**.
- 5.1.2 The Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning Work Plan proposal in 5.1.1 shall include at a minimum, all of the following:
- (a) a comprehensive plan for decommissioning the Kiln # 1, Kiln # 2 and Kiln # 3 area;
 - (b) methods to delineate the vertical and horizontal extent of the contamination in the Kiln # 1, Kiln # 2 and Kiln # 3 area;
 - (c) a representative background soil sample location;
 - (d) a plan for decommissioning piezometer 08-18A;
 - (e) a groundwater and surface water monitoring plan for the Kiln # 1, Kiln # 2 and Kiln # 3 area;
 - (f) a remediation plan for the Kiln # 1, Kiln # 2 and Kiln # 3 area; and
 - (g) a schedule for implementing the decommissioning activities.
- 5.1.3 The approval holder shall correct all deficiencies in the Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning Work Plan proposal as outlined in writing by the Director by the deadline specified in writing by the Director.
- 5.1.4 The approval holder shall implement the Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning Work Plan as authorized in writing by the Director.

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- 5.1.5 Commencing in 2010, the approval holder shall submit an Annual Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning and Reclamation Report to the Director by December 31 of each year until decommissioning is complete.
- 5.1.6 The Annual Kiln # 1, Kiln # 2 and Kiln # 3 Decommissioning and Reclamation Report referred to in 5.1.5 shall include, at a minimum, all of the following:
- (a) summary of decommissioning and monitoring activities conducted during the reporting period;
 - (b) status of decommissioning;
 - (c) decommissioning and monitoring activities planned for the following reporting period;
 - (d) summary and interpretation of monitoring data collected for the reporting period;
 - (e) interpretation of monitoring data collected historically; and
 - (f) any other information requested in writing by the Director.

SECTION 5.2: KILN #4, KILN #5 GBF AND RAW MILL #1 DECOMMISSIONING PLAN

- 5.2.1 The approval holder shall submit a written Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning Plan to the Director within six months of Kiln # 4 ceasing operations.
- 5.2.2 The Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning Plan in 5.2.1 shall include at a minimum, all of the following:
- (a) a plan for dismantling and decommissioning the following equipment:
 - (i) Kiln # 4 and associated equipment,
 - (ii) Kiln # 4 electrostatic precipitator exhaust stack,
 - (iii) Kiln # 4 electrostatic precipitator,
 - (iv) Kiln # 4 Clinker Cooler GBF,
 - (v) Kiln # 5 Clinker Cooler GBF, and
 - (vi) Raw Mill # 1;

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- (b) a comprehensive study to determine the nature, degree and extent of contamination at the plant and affected lands;
 - (c) a public consultation plan;
 - (d) a dust control plan;
 - (e) a plan to manage all wastes produced at the plant during decommissioning;
 - (f) evaluation of remediation technologies proposed to be used at the plant and affected lands;
 - (g) a plan for decontamination of the plant and affected lands in accordance with 5.4.1(e) (i), (ii), (iii),(iv), and (v);
 - (h) confirmatory testing to indicate compliance with the remediation objectives;
 - (i) a plan for maintaining and operating contaminant monitoring systems.
- 5.2.3 The approval holder shall correct all deficiencies in the Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning Plan proposal as outlined in writing by the Director, by the deadline specified in writing by the Director.
- 5.2.4 The approval holder shall implement the Decommissioning plan as authorized in writing by the Director.
- 5.2.5 Commencing the year following the year in which the Decommissioning Plan is authorized pursuant to 5.2.4, the approval holder shall submit an Annual Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning and Reclamation Report to the Director by December 31 of each year, until decommissioning is complete.
- 5.2.6 The Annual Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning and Reclamation Report referred to in 5.2.5 shall include, at a minimum, all of the following:
- (a) summary of decommissioning and monitoring activities conducted during the reporting period;
 - (b) status of decommissioning;
 - (c) decommissioning activities planned for the following reporting period;
 - (d) summary and interpretation of monitoring data collected for the reporting period;

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- (e) interpretation of monitoring data collected historically; and
- (f) any other information required by the Director.

5.2.7 The approval holder shall correct all deficiencies in the Annual Kiln # 4, Kiln # 5 GBF, and Raw Mill # 1 Decommissioning and Reclamation Report as outlined in writing by the Director by the deadline specified in writing by the Director.

SECTION 5.3: RECLAMATION OF THE ENTIRE PLANT SITE

5.3.1 The approval holder shall apply for an amendment to this approval to reclaim the plant by submitting:

- (a) a Decommissioning Plan; and
- (b) a Land Reclamation Plan to the Director.

5.3.2 The Decommissioning Plan and Land Reclamation Plan referred to in 5.3.1 shall be submitted within six months of the plant ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.

SECTION 5.4: DECOMMISSIONING PLAN

5.4.1 The Decommissioning Plan referred to in 5.3.1 shall include, at a minimum, the following:

- (a) a plan for dismantling the plant;
- (b) a comprehensive study to determine the nature, degree and extent of contamination at the plant and affected lands;
- (c) a plan to manage all wastes produced at the plant during operation and decommissioning;
- (d) evaluation of remediation technologies proposed to be used at the plant and affected lands;
- (e) a plan for decontamination of the plant and affected lands in accordance with the following:
 - (i) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

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- (ii) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,
- (iii) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN1299, 1999, as amended, and
- (iv) for surface water, *Surface Water Quality Guidelines for Use in Alberta*, Alberta Environment, November 1999, as amended,
- (v) for soil or water to contaminant levels in accordance with a risk assessment procedure accepted in writing by the Director;
- (f) confirmatory testing to indicate compliance with the remediation objectives;
and
- (g) a plan for maintaining and operating contaminant monitoring systems.

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SECTION 5.5: LAND RECLAMATION PLAN

5.5.1 The Land Reclamation Plan referred to in ~~35~~.3.1 which shall include, at a minimum, the following:

- (a) the final use of the reclaimed area and how equivalent land capability will be achieved;
- (b) removal of infrastructure;
- (c) restoration of drainage;
- (d) soil replacement;
- (e) erosion control;
- (f) revegetation and conditioning of the plant including:
 - (i) species list, seed source and quality, seeding rates and methods,
 - (ii) fertilization rates and methods,
 - (iii) wildlife habitat plans where applicable; and
- (g) reclamation sequence and schedule.

~~DATED~~ April May , 2009
DATED

DESIGNATED DIRECTOR UNDER THE ACT
MAY MAH-PAULSON, M.Sc., P.Eng