



392 MCGRATH HIGHWAY, SOMERVILLE, MA. 02143
PHONE: 617-628-5500 FAX: 617-628-0044

March 26th, 2010

US Environmental Protection Agency
NCCW GP Processing
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Re: Non-Contact Cooling Water General Permit Notice of Intent (NOI)

On behalf of our client, P&S Construction Inc., Excel Energy Solutions, LLC submits the attached Notice of Intent (NOI) to the USEPA and the MassDEP to be covered by the NPDES Non-Contact Cooling Water General Permit for the discharge of non-contact cooling water to the Stony Brook Reservoir.

Our client, P&S Construction Inc, would like to be completely moved into this new facility in July of 2010 with this geothermal heating and cooling system working properly.

Enclosed, please find the Notice of Intent for the Non-Contact Cooling Water General permit. Please contact me if you have questions regarding this application.

Thank you very much.

Sincerely,

Joshua Caplan

Project Engineer
Excel Energy Solutions, LLC
617.628.5500

Notice of Intent Clarifications:

Asterisks on the Notice of Intent form indicate a lack of information on the specified water source. The USGS was contacted, but there was no additional information on this particular surface water besides the flow characteristics found with USGS Streamstats.

N/A is specified in Section 4 for monthly average intake of the CWIS during the previous 5 years due to the fact this is a new discharge.

In Section 2, the fields that ask for the Max Temperature of the discharge as well as the monthly average temperature are left blank because these values greatly depend on the season. We believe the temperature of the discharge will be 6-8 °F cooler than the source water during the summer months and 6-8 °F warmer during the winter months.

Time Constraint:

Our client, P&S Construction, Inc, would like to be moved into this new facility in July of 2010 with the geothermal heating and cooling system working properly.

APPENDIX 5

Suggested Form for Notice of Intent (NOI) for the Noncontact Cooling Water General Permit

1. General facility information. Please provide the following information about the facility.

a) Name of facility: Pond View Place		Type of Business: Office Building for P&S Construction-	
Facility Location Address : 11 School Street Chelmsford, MA 01824 longitude: -71°24'13" latitude: 42°37'01"		Facility SIC codes:	Facility Mailing Address (if not location address)
b) Name of facility owner: Jignesh Patel		Email address of owner: patelj@psconstruction.net	
Owner's Tel #: (978) 452-3782 Owner's Fax # (978) 452-3784		Owner is (check one): 1. Federal _____ 2. State _____ 3. Tribal _____ 4. Private ☒ 5. Other _____ (Describe) _____	
Address of owner (if different from facility address)			
Legal name of Operator, if not owner: Same as Owner			
Operator Contact Name: _____			
Operator Tel Number: _____ Fax Number: _____			
Operator's email: _____			
Operator Address (if different from owner)			
d) Attach topographic map indicating the locations of the facility and the receiving water; all NCCW discharge points; upstream and downstream monitoring points. Map attached? ☒			
e) Check Yes or No for the following:			
1. Has a prior NPDES permit been granted for the discharge? Yes _____ No ☒ If Yes, Permit Number: _____			
2. Is the discharge a "new discharge" as defined by 40 CFR Section 122.22? Yes ☒ No _____			
3. Is the facility covered by an individual NPDES permit? Yes _____ No ☒ If Yes, Permit Number _____			
4. Is there a pending application on file with EPA for this discharge? Yes _____ No ☒ If Yes, date of submittal: _____			

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as needed)

a) Name of receiving water into which discharge will occur: Stony Brook Reservoir
 State Water Quality Classification: B (Warm Water) Freshwater: X Marine Water: _____

b) Describe the discharge activities for which the owner/applicant is seeking coverage: Non- Contact Cooling Water

c) **FOR MASSACHUSETTS FACILITIES ONLY:** Engineering Calculations: Submit the completed engineering calculation of the surface water temperature rise as shown in Attachment A of the General Permit. Check if attached: ✓

d) Number of outfalls 1

For each outfall:

e) What is the maximum daily and average monthly flow of the discharge? Note that EPA will use the flow reported here as the facility's permitted effluent flow limit. Max Daily Flow 345600 GPD Average Flow 110465 GPD

f) What is the maximum daily and average monthly temperature of the discharge (in degrees F)? Max Temp. _____ Average Temp. _____

g) What is the maximum and minimum monthly pH of the discharge (in s.u.)? Max pH 8.0 Min pH 6.5

h) **FOR MASSACHUSETTS FACILITIES ONLY:** Is the source water of the NCCW potable water? Yes ✓ No _____ If Yes, EPA will calculate the Total Residual Chlorine limit for facilities located in Massachusetts.

i) Is the discharge continuous? Yes ✓ No _____ If no, is the discharge periodic (P) (occurs regularly, i.e., monthly or seasonally, but is not continuous all year) or intermittent (I) (occurs sometimes but not regularly) or both (B) _____
 If (P), number of days or months per year of the discharge _____ and the specific months of discharge _____;
 If (I), number of days/year there is a discharge _____

j) Latitude and longitude of each discharge within 100 feet: outfall 1: long. -71°24'13" lat. 42°37'01"; outfall 2: long. _____ lat. _____;
 outfall 3: long. _____ lat. _____ (See http://www.epa.gov/tri/report/siting_tool)

k) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water 3.21 cfs
 Please attach any calculation sheets used to support stream flow and dilution calculations. See General Permit Attachment B for equations and additional information.

MASSACHUSETTS FACILITIES: See Part 3.4 and Appendix 1 of the General Permit for more information on ACEC. Areas of Critical Environmental Concern (ACEC): Does the discharge occur in an ACEC? Yes _____ No ✓
 If yes, provide the name of the ACEC: _____

3. NCCW Source Water Information. Please provide information about the NCCW source water, using separate sheets as necessary:

a) Indicate source of the NCCW (i.e., municipal water supply, private well, surface water withdrawal, groundwater): Source: <u>Surface Water</u> Name of Source Water: <u>Stony Brook Reservoir</u> Is the source registered/permitted under MA Water Management Act or NHDES Water User Registration Rule (Env W/q 2202)? Yes <u> </u> No <u>✓</u> If yes, registration number: <u> </u>	b) If source water is surface water: i) Is it a freshwater river or stream Yes <u>✓</u> No <u> </u> ii) Is it a lake? <u> </u> reservoir? <u>X</u> iii) Is it tidal river? <u> </u> estuary? <u> </u> ocean? <u> </u> c) Is the source water groundwater? Yes <u> </u> No <u>X</u> If yes, see Appendix 8 and submit effluent and surface water test results, as required in Part 5.4 of the General Permit. d) Does the facility use both a primary and backup source of noncontact cooling water? Yes <u> </u> No <u>✓</u> If yes, attach information that identifies and explains the primary and backup sources of noncontact cooling water for and how often the backup supply was used in last three years.
---	---

4. Best Technology Available for CWIS

Are you subject to BTA requirements at Part 4.2 of the General Permit? (Facility's discharge is covered by this General Permit and the facility withdraws noncontact cooling water from surface source water). Yes <u>✓</u> No <u> </u> If No, explain: If YES, attach the facility-specific BTA description as required in Part 4.3 of the General Permit. For additional information and guidance, see Questions 13-23 of the NCCW Fact Sheet, posted at http://www.epa.gov/region1/nhpdes/nccwgp.html. Provide a map showing the location of each CWIS intake structure; NCCW outfall(s) and any CWIS feature referred to in the BTA description. Include in your description: <u> </u> Measures to meet the General Permit Part 4.3.a general BTA requirements, including documentation that describes the facility's monitoring program for impinged fish and/or invertebrate; or the required alternative monitoring plan frequency and/or protocol <u> </u> A characterization of the source water body's aquatic life habitat in the vicinity of each CWIS during the seasons when the CWIS may be in use <u> </u> The attributes of the current CWIS <u> </u> Design measures of the CWIS <u> </u> Operation measures of the CWIS <u> </u> Historical occurrence of impinged fish for the past five years <u> </u> If applicable, a demonstration that the facility's intake rate is commensurate with a closed-cycle recirculation system <u> </u> Other components to reduce impingement and/or entrainment of aquatic life

4. BTA FOR CWIS CONTINUED:

Provide the following information for each CWIS to support your attached facility-specific BTA description.

Design capacity of the of the CWIS 34560MGD

Maximum monthly average intake of the CWIS during the previous five years N/A MGD Month in which this flow occurred N/A

Maximum through-screen design intake velocity <0.5 feet/second (fps)

For facilities where the CWIS is located on a freshwater river or stream, provide the following information:

The source water's annual mean flow * cubic feet/second (cfs) as available from USGS or other appropriate source

The design intake flow as a % of the source water's annual mean flow * Attach calculations if equal to or less than 5% of annual mean flow.

The source water's 7Q10 3.21 cfs. See Attachment B of the General Permit for more information on 7Q10 determinations.

The design intake flow as a percent of the source water's 7Q10 5.32% (Using Average design intake flow)

5. Contaminant Information

If applicable, attach a listing of all non-toxic pH neutralization and/or dechlorination chemicals used, including chemical name and manufacturer; maximum and average daily quantity used as well as the maximum and average daily expected concentrations (mg/l) in the NCCW discharge, and the vendor's reported aquatic toxicity (NOAEL and/or LC₅₀ in percent for aquatic organism(s)).

6. Determination of Endangered Species Act Eligibility: Provide documentation of ESA eligibility as required at Part 3.4 and Appendix 2, Part C, Step 4, of the General Permit. In addition, respond to the following questions.

a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes No ✓

b) Has any consultation with the federal services been completed? Yes No ✓

c) Is consultation underway? Yes No ✓

d) What were the results of the consultation with the U.S. Fish and Wildlife Service and/or NOAA Fisheries Service (check one):
a "no jeopardy" opinion or written concurrence on a finding that the discharges are not likely to adversely affect any endangered species or

e) Which of the five eligibility criteria listed in Appendix 2, Section B (A,B,C,D or E) have you met? A

f) Attach a copy of the most current federal listing of endangered and threatened species from the USF&W web site listed in Appendices 2, 2.1 and 4

7. Documentation of National Historic Preservation Act requirements: Please respond to the following questions:

a) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility site or in proximity to the discharge? Yes No ✓

b) Have any State or Tribal historic preservation officers been consulted in this determination? Yes or No ✓ If yes, attach the results of the consultation(s).

c) Which of the three National Historic Preservation Act requirements listed in Appendix 3, Section C (1,2 o3) have you met? 1

- 8. Supplemental Information:** Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit
- 9. Signature Requirements:** The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22 (see below) including the following certification:

I certify under penalty of law that (1) no biocides or other chemical additives except for those used for pH adjustment and/or dechlorination are used in the noncontact cooling water (NCCW) system; (2) the discharge consists solely of NCCW (to reduce temperature) and authorized pH adjustment and/or dechlorination chemicals; (3) the discharge does not come in contact with any raw materials, intermediate product, water product (other than heat) or finished product; (4) if the discharge of noncontact cooling water subsequently mixes with other wastewater (i.e. stormwater) prior to discharging to the receiving water, any monitoring provided under this permit will be only for noncontact cooling water; (5) where applicable, the facility has complied with the requirements of this permit specific to the Endangered Species Act and National Historic Preservation Act; and (6) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility Name: Pond View Place Operator signature: Title: Date:

Federal regulations require this application to be signed as follows:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively, or,
3. For a municipality, State, Federal or other public facility, by either a principal executive officer or ranking elected official.

Notice of Intent
Non-Contact Cooling Water General Permit

General Description of Facility:

Pond View Place located at 11 School Street, Chelmsford, MA 01824 is an office building for P&S Construction. This facility will use non-contact cooling water for the heat exchangers to provide heating and cooling for the building using a geothermal open loop system.

Description of Cooling Water Intake System (CWIS):

The cooling water is “once through” cooling water obtained from the Stony Brook Reservoir of the Merrimack River basin. The water passes through a stainless steel heat exchanger and is then returned to the Stony Brook Reservoir. The average flow of the non-contact cooling water (NCCW) is 110,465 gallons per day (GPD) and the maximum flow is 345,600 GPD.

For the purposes of this Non-Contact Cooling Water General permit, the CWIS extends from the point at which the water is withdrawn from the Stony Brook Reservoir up to and including the intake pumps. The NCCW is utilized at heat exchangers in the facility and then discharged to another 6” diameter pipe back into the Stony Brook Reservoir approximately 75 ft away.

The NCCW is withdrawn through a 6-inch diameter pipe that extends approximately 10 feet into the reservoir to a depth of approximately 8 feet. The mid-depth location was chosen to decrease the likelihood of bringing eggs and fish near the ground into the CWIS, and prevent bringing in surface dwellers as well. The 6-inch pipe will be attached to a fabricated 24” x 24” box, which will reduce the through-screen velocity below the threshold value of 0.5 ft/s. The variable speed pump that will be used is rated at 250 gallons per minute (GPM) at full speed with pressures up to 140 psi.

Best Technology Available For CWIS – General Requirements

- 1.) The first general requirement is to reduce the intake of the cooling water whenever withdrawal of source water is not necessary to reduce the intake through screen flow. By using the variable speed pump we have selected the smallest flow possible of satisfying the heating and cooling requirements of the facility will be used. By decreasing this flow, the intake through screen velocity will decrease as well.
- 2.) The second general requirement is to return all fish that are impinged on or in the CWIS to the source water. The building maintenance team will have a monitoring schedule set up and if any impinged fish are noticed they will be returned to the source water in a proper manner.

- 3.) The third general requirement is to ensure there is no chlorinated water sprayed on impinged fish. This is not applicable to this facility due to the fact using chlorinated water will not be sprayed on impinged fish.
- 4.) In order to reduce impingement and mortality, the following aspects of the CWIS were accounted for in the design process.
 - a. The diameter of the pipe and the size of the fabricated box, to reduce through screen velocity to be as low as possible.
 - b. The size of the mesh of the screen, to decrease the likelihood of a fish entering the CWIS.

Calculation for Temperature Change in Stony Brook Reservoir

$$Q_{\text{plant}} = C_p m_p \Delta T_p$$

$$Q_{\text{river}} = C_p m_r \Delta T_r$$

$$C_p m_p \Delta T_p = C_p m_r \Delta T_r$$

$$\Delta T_r = m_p / m_r \times \Delta T_p$$

Where: Q_{plant} = Heat load discharged from the plant
 Q_{river} = The energy the river receives from the plant
 C_p = heat capacity of water = 1.0 °F x btu/lb
 m_p = mass of effluent, lbs (gal. or cubic feet per second if volume is used)
 ΔT_p = change in temperature, effluent – influent, °F
 m_r = mass of river, lbs (gal. or cubic feet per second if volume is used)
 ΔT_r = change in river temperature, °F

In this particular case, all of the heat load discharged from the plant is assumed to be absorbed by the river, in which case :

$$Q_{\text{plant}} = Q_{\text{river}}$$

$$Q_{\text{river}} = C_p m_r \Delta T_r$$

$$\Delta T_r = \frac{Q_{\text{river}}}{C_p m_r}$$

$$\Delta T_r = \frac{(960000 \text{ BTU/hr})(1 \text{ lb/BTU}^\circ\text{F})(24 \text{ hr/day})(1 \text{ gal}/8.34 \text{ lbs})}{(3.21 \text{ cfs})(0.645 \text{ Mgd/cfs})(100000)}$$

$\Delta T_r = 1.334 \text{ }^\circ\text{F}$

Calculation for Dilution Factor

$$\text{Dilution Factor} = \frac{Q_R + (Q_P \times 1.55)}{Q_P \times 1.55}$$

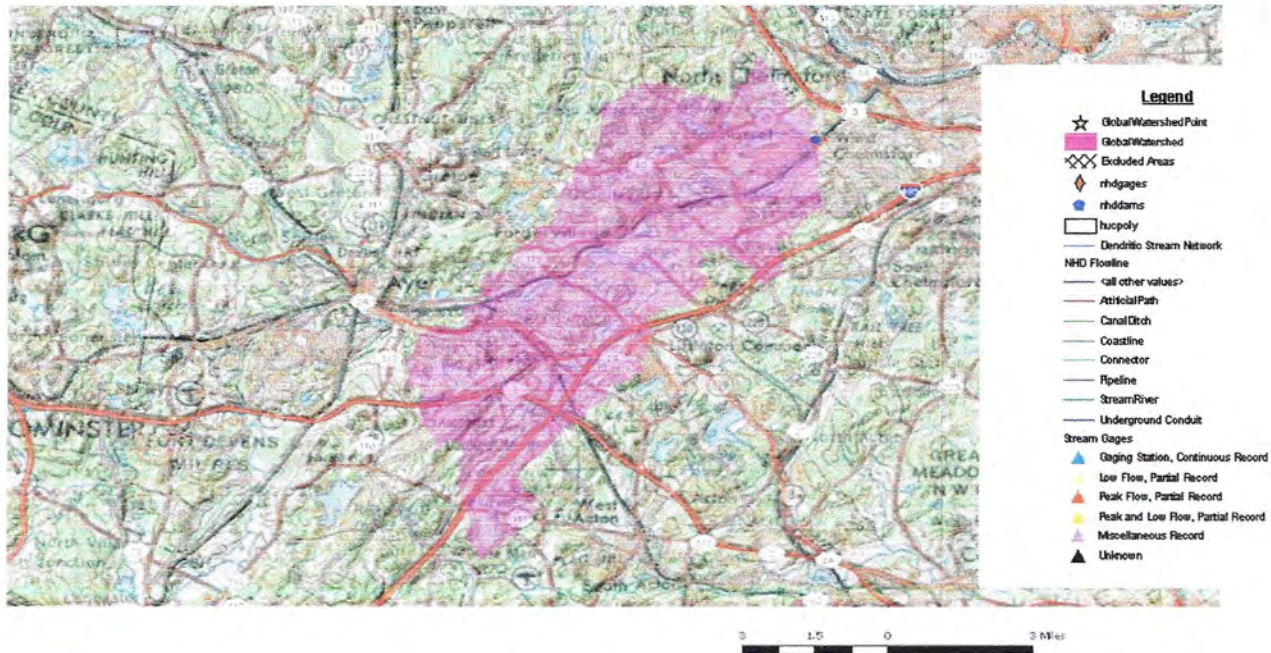
Where: Q_R = Estimated 7Q10 low flow for the receiving water at the plant's outfall, in cubic feet per second (cfs).
 Q_P = Plant's maximum design flow, in million gallons per day (mgd).
1.55 = Factor to convert mgd to cfs.

$$\text{Dilution Factor} = \frac{3.21 + (0.3456 \times 1.55)}{(0.3456 \times 1.55)}$$

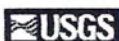
Dilution Factor = 6.992



Pond View Place



3/22/2010 9:22:28 AM



Massachusetts StreamStats

Streamstats Ungaged Site Report

Date: Mon Mar 22 2010 09:04:37 Mountain Daylight Time

Site Location: Massachusetts

NAD83 Latitude: 42.6169 (42 37 00)

NAD83 Longitude: -71.4035 (-71 24 12)

NAD27 Latitude: 42.6168 (42 37 00)

NAD27 Longitude: -71.4040 (-71 24 14)

ReachCode: 01070006000516

Measure: 3.33

Drainage Area: 41.6 mi²

Low Flows Basin Characteristics

100% Statewide Low Flow (41.6 mi²)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	41.6	1.61	149
Mean Basin Slope from 250K DEM (percent)	2.84	0.32	24.6
Stratified Drift per Stream Length (square mile per mile)	0.26	0	1.29
Massachusetts Region (dimensionless)	0	0	1

Probability of Perennial Flow Basin Characteristics

100% Perennial Flow Probability (41.6 mi²)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	41.6 (above max value 1.99)	0.01	1.99
Percent Underlain By Sand And Gravel (percent)	55.28	0	100
Percent Forest (percent)	55.36	0	100
Massachusetts Region (dimensionless)	0	0	1

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

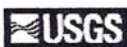
Low Flows Streamflow Statistics

Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
D50	42.8	18		24.6	74.1
D60	33.7	20		14.1	80
D70	22.8	24		9.21	55.7
D75	18.4	26		7.51	44.3
D80	15.9	28		6.37	38.9
D85	12.5	32		4.79	31.9
D90	10.2	37		3.77	26.9
D95	6.46	46		2.1	19.3
D98	4.21	60		1.19	14.1
D99	3.31	65		0.88	11.7
M7D2Y	6.46	50		1.99	20.1
AUGD50	13.1	33		5.05	33.6
M7D10Y	3.21	71		0.81	11.9

The equation for estimating the probability of perennial flow is applicable for most areas of Massachusetts except eastern Buzzards Bay, Cape Cod, and the Island regions. The estimate obtained from the equation assumes natural flow conditions at the site. The equation also is best used for sites with drainage areas between 0.01 to 1.99 mi², as errors beyond for basins beyond these bounds are unknown.

Probability of Perennial Flow Statistics

Statistic	Value	Standard Error (percent)
PROBPEREN	1	

*Massachusetts StreamStats***Basin Characteristics Report****Date:** Mon Mar 22 2010 09:03:54 Mountain Daylight Time**NAD83 Latitude:** 42.6169 (42 37 00)**NAD83 Longitude:** -71.4035 (-71 24 12)**NAD27 Latitude:** 42.6168 (42 37 00)**NAD27 Longitude:** -71.4040 (-71 24 14)**ReachCode:** 01070006000516**Measure:** 3.33

Parameter	Value
Area in square miles	41.6
Average area slope in percent	2.84
Total stream length in miles	87.1
stratified drift per unit stream length	0.26
low flow region indicator for Massachusetts	0
Area of forest land (percent)	55.36
Area of sand and gravel deposits (percent)	55.28