Capturing the Wind Beneficial Use w/ an AUL

Case Study # 3

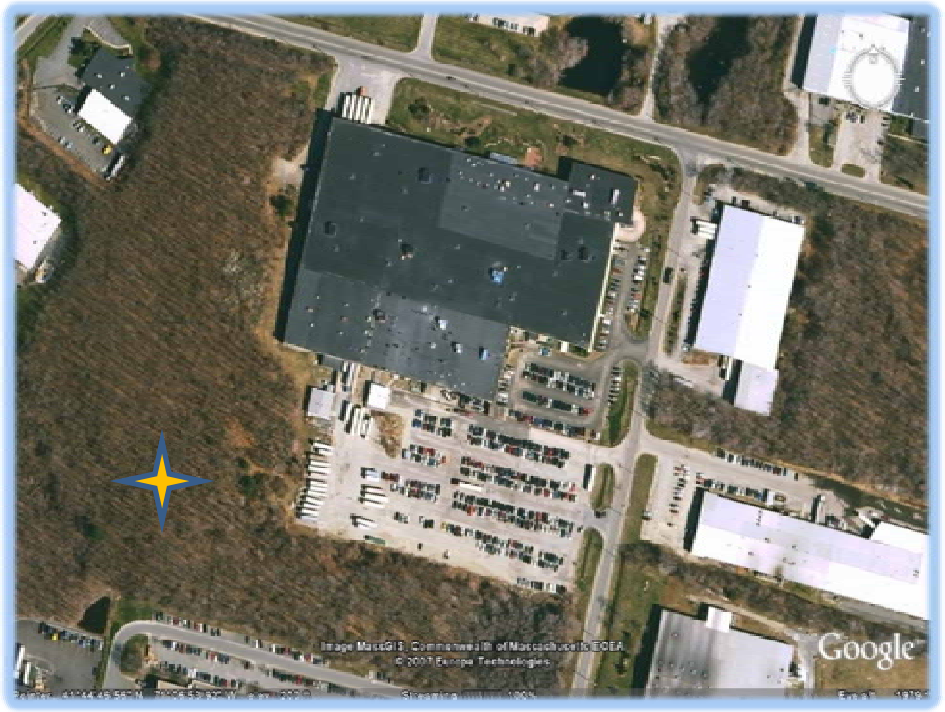
Philips Lightolier, Fall River

Molly Cote, MassDEP Southeast Regional Office

Philips Lightolier Facility
Fall River, MA

Project Location

Project Facility



Project Specifics

- 31.6 acre industrial facility
- 2 MW Turbine
  - ✓ 450 tall
  - ✓ 148 foot blades (require 7 mph wind)
- Expectations:
  - ✓ 70% of facility's electricity needs
  - ✓ Offset production of 30,000 tons of CO_2 over turbine lifetime
- MassCEC funding:
  - ✓ $40,000 – feasibility study
  - ✓ $500,000 – design & construction
- Total Cost - $4 million
  - ✓ 50% reimbursed by grants/tax credits

Project Timeline

- 2007 – Investigation/feasibility study
- 2008 - Wind data monitoring equipment installed
- 2009/2010 - Determined site suitable & proceeded with project development
- Turbine ordered January 2011 & delivered November 2011
- Erected November / Dec 2011
- Interconnection w/ Grid December 2011 → completed April 20, 2012
- Commissioning & startup through May 18, 2012

MCP Site History

- RTN 4-0000553
  - ✓ Notification: April 1988
  - ✓ Waiver approved: June 1989
  - ✓ A-3 RAO w/AUL submitted June 1994
    - AUL errors identified, resubmitted 1999
    - RAO &AUL subsequently retracted
  - ✓ Supplemental Phase II CSA submitted July 2003
  - ✓ Tier II Extension submitted February 2004
  - ✓ Class A-3 RAO w/ AUL submitted June 2004

Site Overview

- Main source of contamination:
  - ✓ Solvents (TCE, PCE) from fill spigot on east side of building
  - ✓ Solvent use at facility discontinued in 1980's
  - ✓ Focused excavation to remove impacted soils
- Nature & Extent:
  - ✓ Low concentrations remain in soil, overburden & shallow bedrock
  - ✓ Plume extends to a downgradient property in industrial park
  - ✓ Discharges to Steep Brook
  - ✓ No CEP, DNAPL or UCL exceedences
  - ✓ Separate, localized release of hydraulic oil addressed under separate RTN (in ROS)

Method 3 Risk Characterization

- Cumulative non-cancer & cancer risk evaluation

On site facility worker	Construction worker
Utility worker	Off-property facility worker
Hypothetical off-property future resident	

✓ Did not exceed applicable risk limits

✓ Did not consider residential, school or daycare uses on facility itself

- Also determined - No Significant Risk of harm to safety, public welfare & environment

2004 A-3 RAO w/ AUL

- Risk reduction measures & other response actions sufficient in scope
- Permanent solution has been achieved
- No Significant Risk (NSR) for affected downgradient property w/ no restrictions
- NSR for current use of Lightolier Facility
- Background has not been achieved, not feasible
- NSR for future use of facility w/ AUL

AUL Permitted Activities & Uses

- Permitted:
  - ✓ Commercial & Industrial
  - ✓ Short-term (6 months or less) underground utility work &/or construction activities
    - provided done in accordance w/ Obligations & Conditions & MCP soil storage/transport procedures

Activities & Uses Inconsistent w/ AUL

- Residential, school, daycare, nursery, recreational area
  - ✓ or any other use where child's presence is likely
- Soil excavation >2ft w/o Soil and De-watering Management Plan & Health & Safety Plan
- Relocation of soil located >2ft in depth
  - Unless first evaluated by LSP who renders Opinion that No Significant Risk is maintained

AUL Obligations & Conditions

- Soil & De-watering (if applicable) Management Plan required prior to any activity likely to disturb soil >2ft
  - ✓ Plan must describe:
    - Procedures to screen/characterize soil & groundwater
    - Soil & groundwater management procedures
    - Soil storage & transport procedures
- Although worker exposure should not result in unacceptable risk, consult LSP to determine whether Health & Safety Plan required
- No relocation of soil located >2ft, unless LSP renders Opinion stating consistent w/ maintaining NSR

2007 Confirmatory AUL

- Required to correct violations identified as a result of technical screening audit:
  - ✓ NOAF/NON stated Form 1075 had been "significantly altered" (violation of 310 CMR 40.1074(1)(a)
    - Owners source of title deleted from first "whereas" clause
    - AUL Opinion states this property is a portion of the disposal site but form 1075 says AUL applies only to this property, not entire Disposal Site (which is comprised of several properties)
- No changes to:
  - ✓ Activities & Uses Consistent with AUL Opinion
  - ✓ Activities & Uses Inconsistent with AUL Opinion
  - ✓ Obligations & Conditions set forth in AUL Opinion

Wind Turbine Feasibility Study

- Geographically well suited
  - ✓ Good wind resources (average wind speed 5.3 m/s @58 meters)
  - ✓ Significant electric load (≈ 9,938,000 kWh/year)
  - ✓ Space available for turbine delivery, staging & assembly
  - ✓ Buffer from residential properties
  - ✓ No significant impact on local environmental resources
  - ✓ Some AULs pertaining to 21E cleanup – not expected to preclude the development
  - ✓ Can be permitted on local, state and federal levels
- Economically feasible

Site-specific Health & Safety Plan

"1. Introduction **All work on this project will be carried out in compliance with ARCADIS' Health and Safety policies and procedures, and the Occupational Safety and Health Administration's Hazardous Waste Operations and Emergency Response regulation 29 CFR 1910.120.** The design of this health and safety plan (HASP) conforms to the requirements of the ARC HSFS010 (HASP H&S Procedure). Specific health and safety information for the project is contained in this HASP. **All personnel working on hazardous operations or in the area of hazardous operations shall read and be familiar with this HASP before doing any work.** All project personnel shall sign the certification page acknowledging that they have read and understand this HASP. **Changes in the scope of the project or introduction of new hazards to the project shall require revision of the HASP by the HASP writer and reviewer, and approval by the Project Manager.** The HASP Addendum Form and log table are included as Appendix A."

Health & Safety Plan (cont.)

- Work is outside area of known soil & groundwater contamination
- Chemical hazard: hydraulic oil
- Hard hat & safety glasses at all times

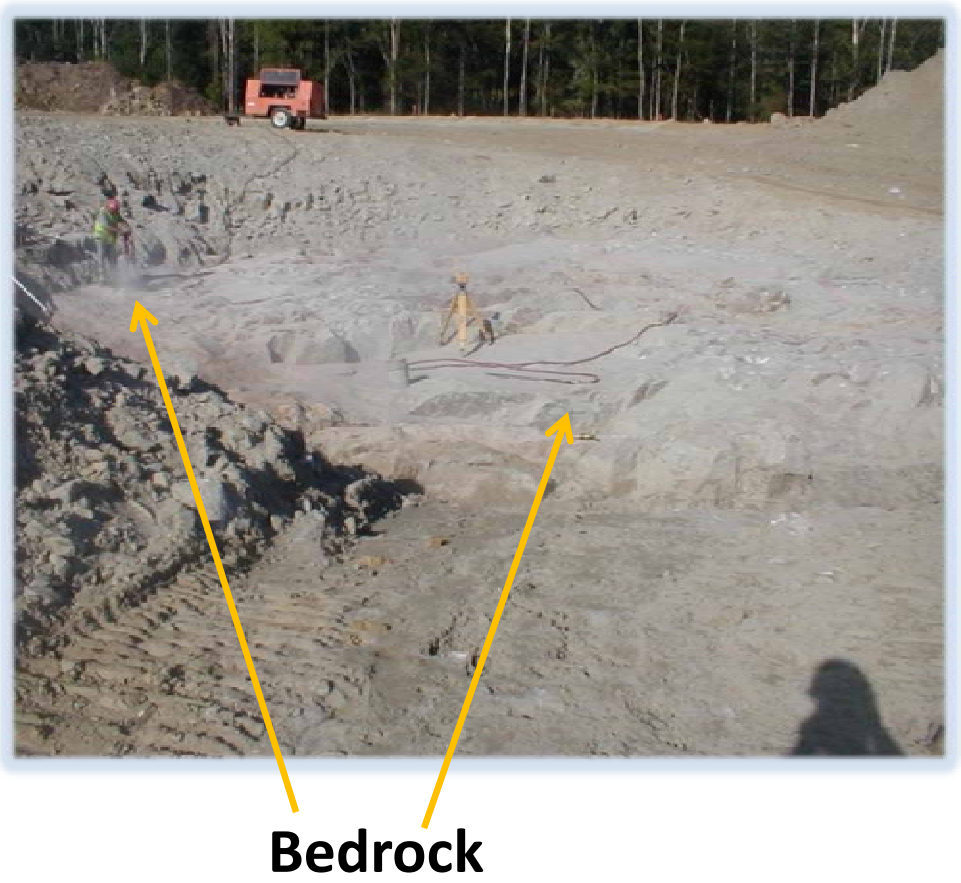
Excavated Soil & Groundwater Management Plan

- Soil Management:
  - Soils to be excavated for concrete pad & utility trenching
  - All excavated soils to remain & be reused on-site
  - Periodic soil inspection, testing & screening by contractor under direction of LSP
  - Excavation to cease immediately if any irregularities or suspect materials identified
  - Contingency: 10 mil polyethylene barrier available to cover soils if deemed necessary

Soil & Groundwater Management Plan (cont.)

- Groundwater Management:
  - Outside area of plume
  - Do not expect significant groundwater infiltration
  - Excavation/backfill work to be conducted during seasonally low ground water period
  - Surface runoff to be diverted away from excavations
  - Any groundwater encountered to be discharged on site
  - If encountered, discharge rate will range from a few gpm to several 10s gpm
  - Temporary check dam to be established
  - Filtering to be conducted if necessary, under LSP direction

Site Preparation



- Trees & vegetation removed
- Soils removed to top of bedrock (≈ 5-7 ft)
- Soil stockpiled on site
- Bedrock cleared of loose material

Site Preparation (cont.)

- 160 cy concrete poured on bedrock
- 60 tons rebar & foundation forms placed
- Additional 350 cy concrete poured on top

Gravity Foundation Construction

Assembling the Turbine

Turbine Assembly (cont.)

Up & Generating

- Expected Generation is 4,000,000 + kw hours / yr
- Offset of Utility cost by $ 480,000 / yr
- Avoidance of 2,758 metric tons of CO2 emissions / yr
- Sunday October 14, 2012 – generation record 34,197 kw hours

"Producing Energy Efficient Lighting Solutions while Consuming the Least Amount of Energy and Other Natural Resources" – Philips Lightolier

Questions ??

Thank You

Special Thanks to Philips Lightolier for providing photos & project information !

Contact Information

Molly Cote, molly.cote@state.ma.us

508-946-2792