



# Geothermal Retrofit of Illinois National Guard State Headquarters Building

May 19, 2010

Principal Investigator

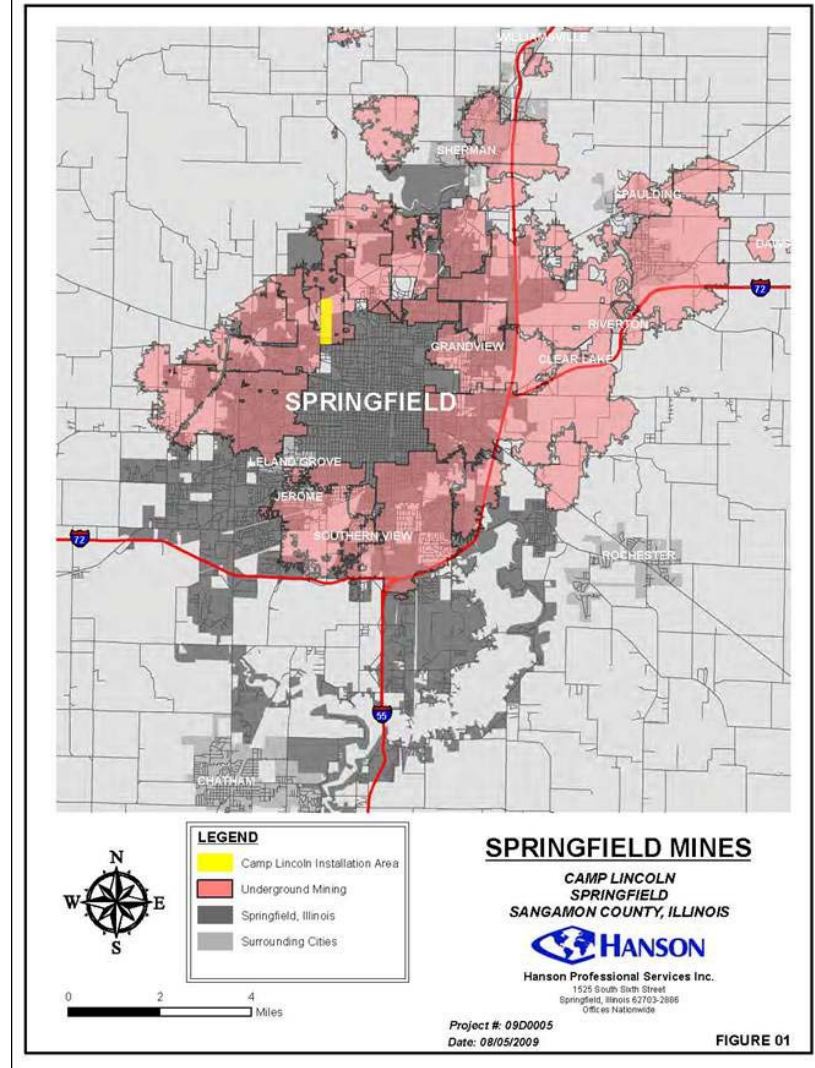
**Mark Lee**

**Department of Military Affairs**

Ground Source Heat Pumps Demonstration  
Projects

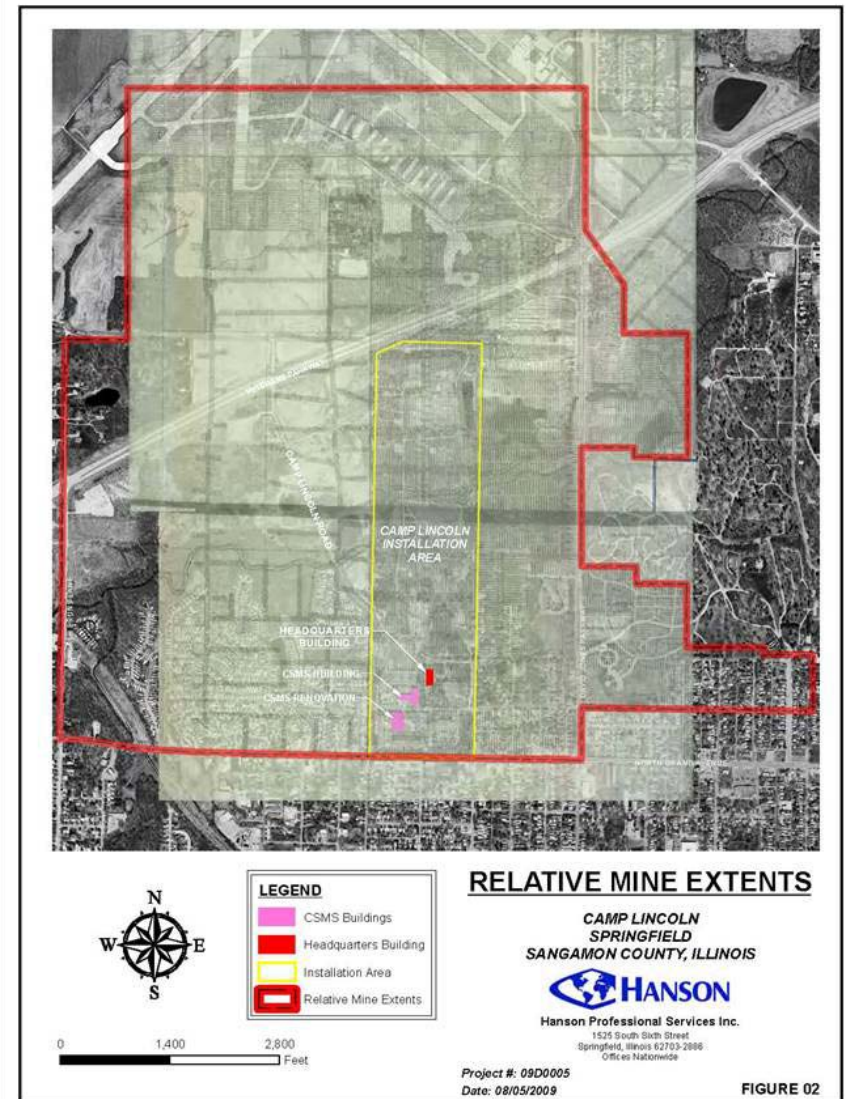
- **Timeline**
  - Start Date: May 2010
  - Feasibility study complete October 1, 2010
  - Project Design complete December 1, 2010
  - Construction complete August 2011
  - Monitoring complete August 2014
- **Budget**
  - Total project funding, DOE share = \$1,200,000, awardee share = \$400,000, To date no funding has been received
- **Barriers**
  - Technical Issues
  - Legal Issues

- Potentially reduces cost of installation by reducing well field requirements from hundreds of wells to as few as two.
- Scalable
- “Green” use of former coal mine
- Payback periods of less than 10 years for implementation to meet National Guard Bureau standards



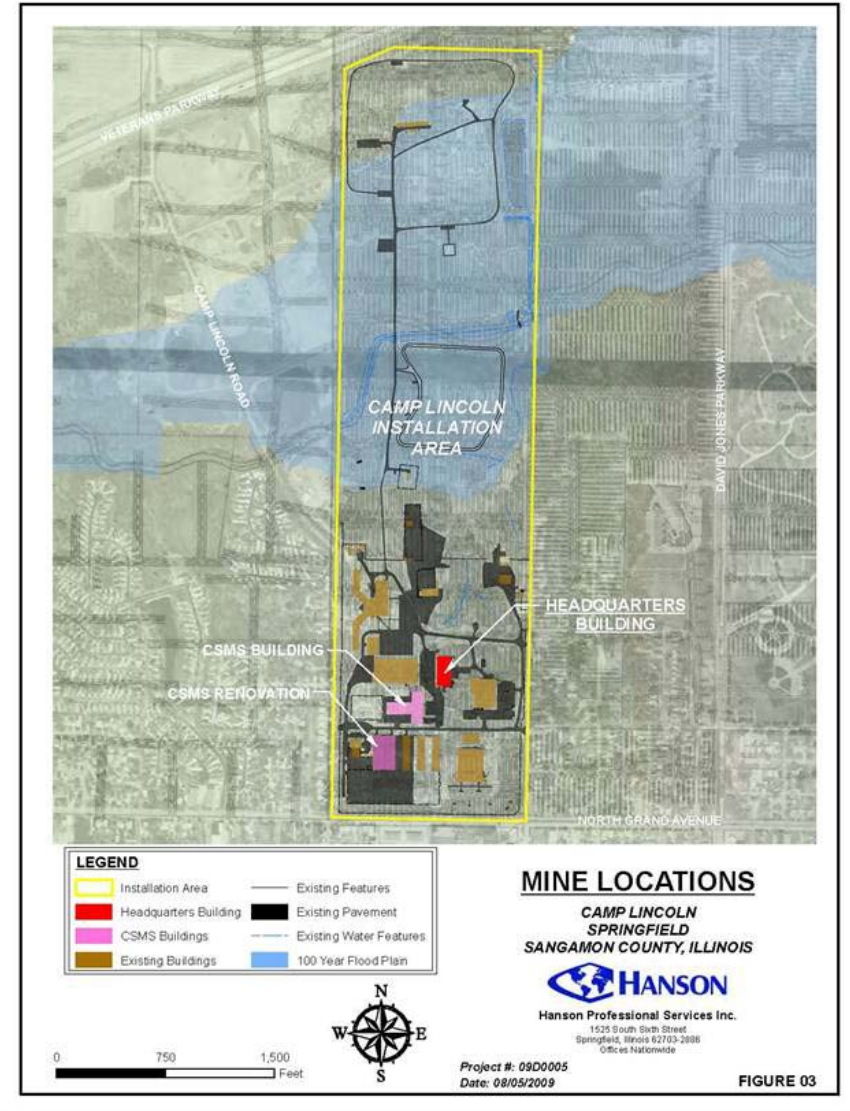


- Determine Legal issues including
  - Ownership
  - Liability
  - Permitting
- Test Wells to determine
  - Water temperature, quality and quantity
  - Recharge rates and design parameters
- Design and Implementation
  - Based on results, design system to
    - Minimize wells
    - Scalability
    - Long term viability



# Accomplishments, Expected Outcomes and Progress

- Develop methodology for determining mine water quality and quantity;
- Determine legal issues related to ownership, liability and permitting requirements;
- Determine the best energy recovery systems that balance cost with environmental or other concerns;
- Estimate scalability for campus use;
- Develop alternative plans and emergency planning for potential changes in mine water availability and temperature
- Publish a methodology for exploiting this resource across the state of Illinois.



- **Project Management**
  - Illinois Department of Military Affairs
    - Mark Lee, Energy Manager
  - Capital Development Board (Illinois state contracting)
    - Gary Kitchen, Project Manager
  - Technical and Design Support
    - Hanson Professional Services/IGE
- **Schedule**
  - Start Date: May 2010
  - Feasibility study complete October 1, 2010
  - Project Design complete December 1, 2010
  - Construction complete August 2011
  - Monitoring complete August 2014
- **Reporting**
  - Feasibility Report
  - Construction Plans
  - Monitoring

- Apply the technology to the planned new Combined Support Maintenance Shop (CSMS), located adjacent to the Headquarters building (2014).
- Expand initial system across the campus as new construction is implemented or retrofitting pre-existing structures (2016-beyond)
- In Illinois, there are over 5,500 abandoned mines that generally lie in the same strata and potentially offer the opportunity for similar geothermal treatments.  
Potential near term sites in Springfield
  - The airport
  - 183<sup>rd</sup> FW (Air Guard)
  - State Fairgrounds

- Key Points
  - Only limited applications of mine water usage for geothermal have been demonstrated before – none in Illinois
  - Illinois National Guard has never attempted a project of this nature
  - Illinois mine landscape is perfectly suited for this application
  - If successful, Illinois National Guard will follow up with multiple applications on Camp Lincoln
  - Should reduce construction costs enough to meet National Guard Bureau guidelines for payback periods – expanding the use of geothermal in new and retro construction significantly.
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