



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS
Connecting Professionals, Practice and the Public

Association of Environmental & Engineering Geologists (AEG)

To join AEG:
www.aegweb.org/join
Student membership is Free!
Ask about our scholarships.



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

Connecting Professionals, Practice and the Public

We Rock Your World

What Geologists Do and How Our
Work Improves Your Life

Association of Environmental & Engineering Geologists

Presenter's Name and Employment

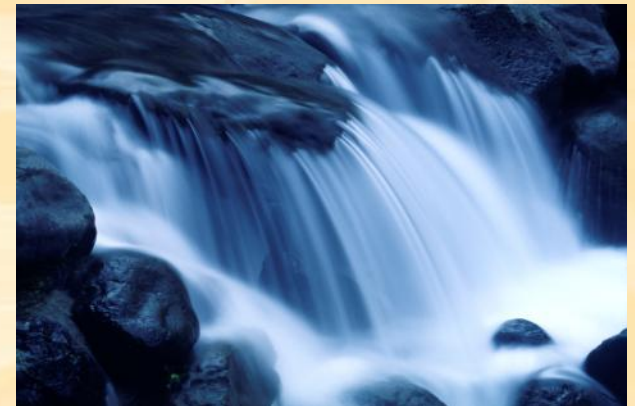
Presenter's Email Address

www.aegweb.org



What is geology?

The study of the earth and its processes, including rocks, soil, water, landforms, and how they all interact.

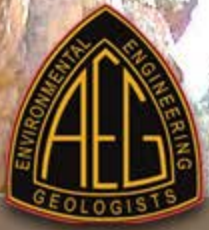




What is applied geology?

Applying the knowledge of the earth and its processes that we have learned through the ages to address problems that affect all of us every day, and to help make our world a better and safer place to live.





What do Environmental & Engineering Geologists and Hydrogeologists do?

We identify, analyze, and mitigate natural and manmade hazards to protect property, public health and the environment.

We investigate and analyze the earth materials present from the ground surface down into the earth to evaluate their suitability for support of proposed structures and to provide recommendations for foundation types based on subsurface conditions.



Why is this relevant and important to you?

Environmental, Engineering, and Hydrogeologists work on:

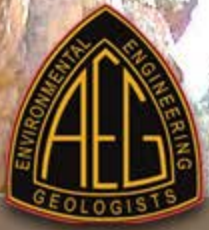
- Natural hazards – landslides, faulting and earthquakes, flooding, sinkholes, volcanoes, and glaciers
- Site Evaluations – investigate sites for design and environmental considerations such as slope stability, seismic hazards, soil and groundwater contamination, and soil and rock properties for construction considerations
- Site Mitigation – design and implement methodologies to clean-up contaminants in the soil and groundwater, and to stabilize earthen materials



Examples

NATURAL HAZARD PROJECTS:

- Identification and stabilization of landslide hazard areas
- Mapping of faults and earthquake prone areas
- Mapping of flood zones
- Identification of sinkhole prone areas and recommendations for fixing sinkholes
- Evaluations of volcanic activity probability
- Studies of potential glacier recesses
- Studies of potential sea level rise and its effects on man-made structures



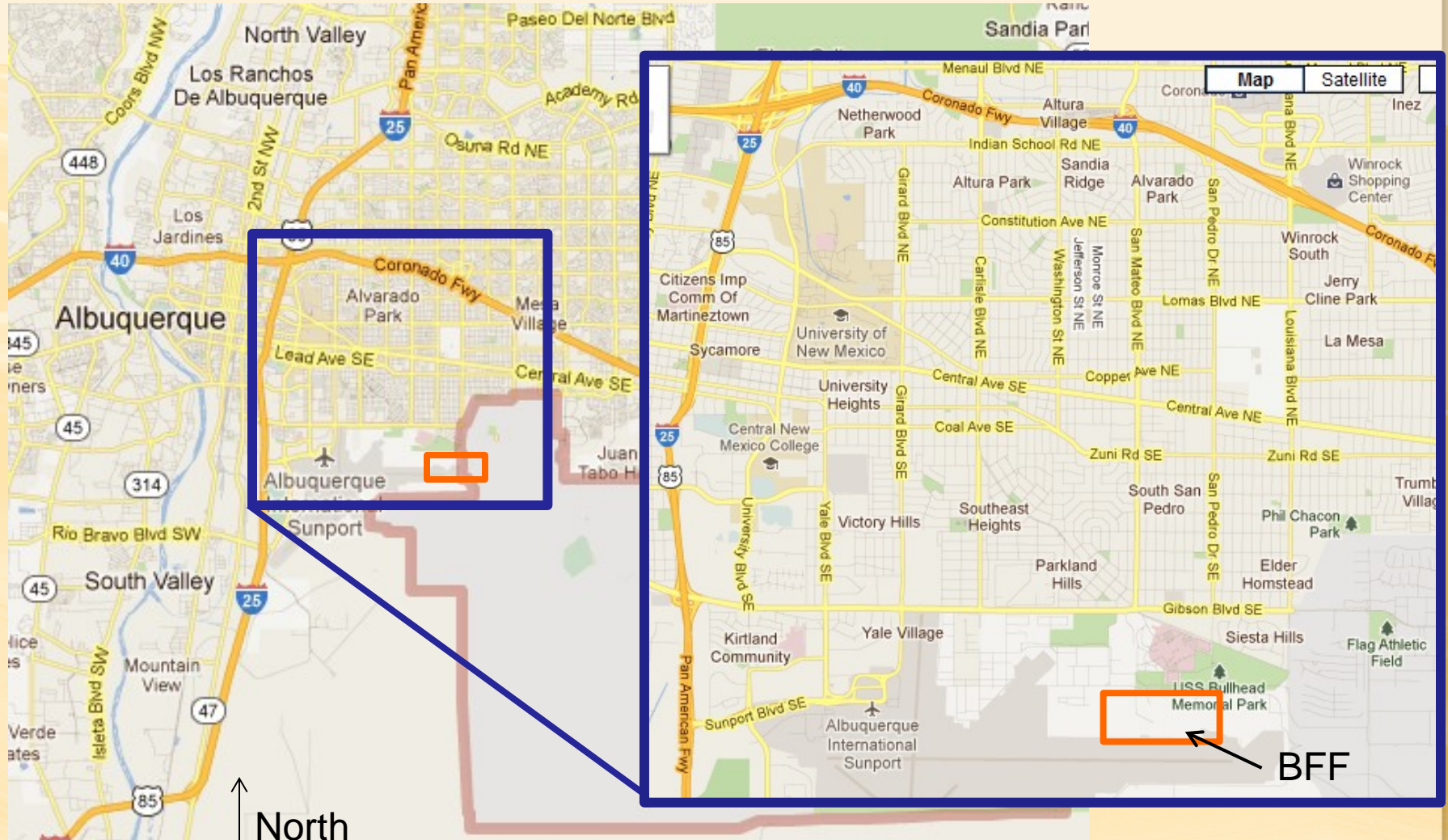
Examples (continued)

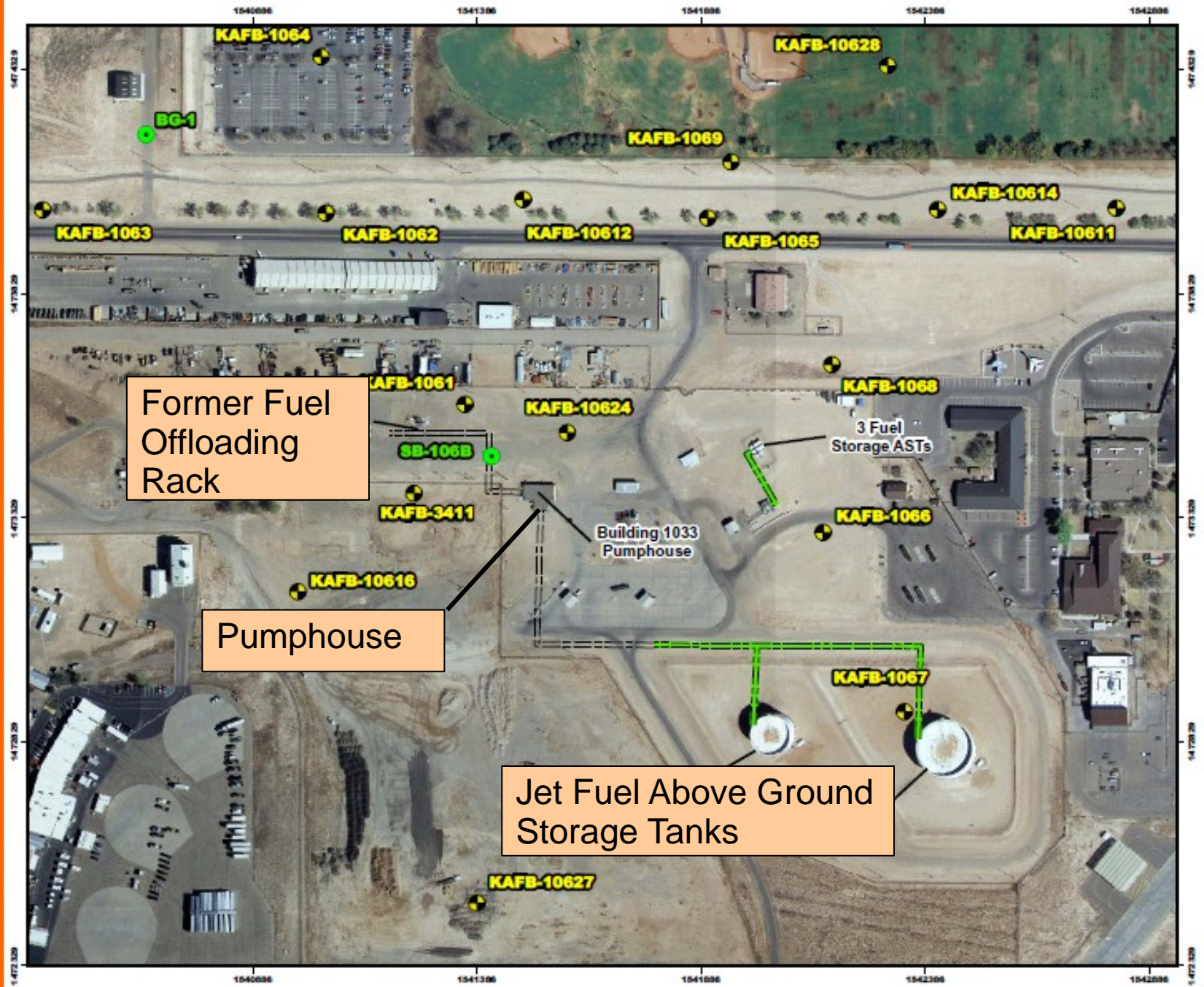
SITE MITIGATION:

- Clean up of soil and groundwater contamination at petroleum storage and hazardous wastes sites
- Prevention of dam failure
- Design and implementation of slope stabilization methodologies
- Recommendations for ground improvement methodologies to allow construction on marginal sites

SITE MITIGATION PROJECT:

Kirtland Air Force Base – Bulk Fuels Facility





Former Fuel Offloading Rack

Pumphouse

Jet Fuel Above Ground Storage Tanks

KAFB– Bulk Fuels Facility

Environmental Geologist's Role:

- Define geology at the site
- Identify types of contaminants
- Identify where they are in the ground
- Recommend ways to clean it up



KAFB– Bulk Fuels Facility

Identify Contaminants found

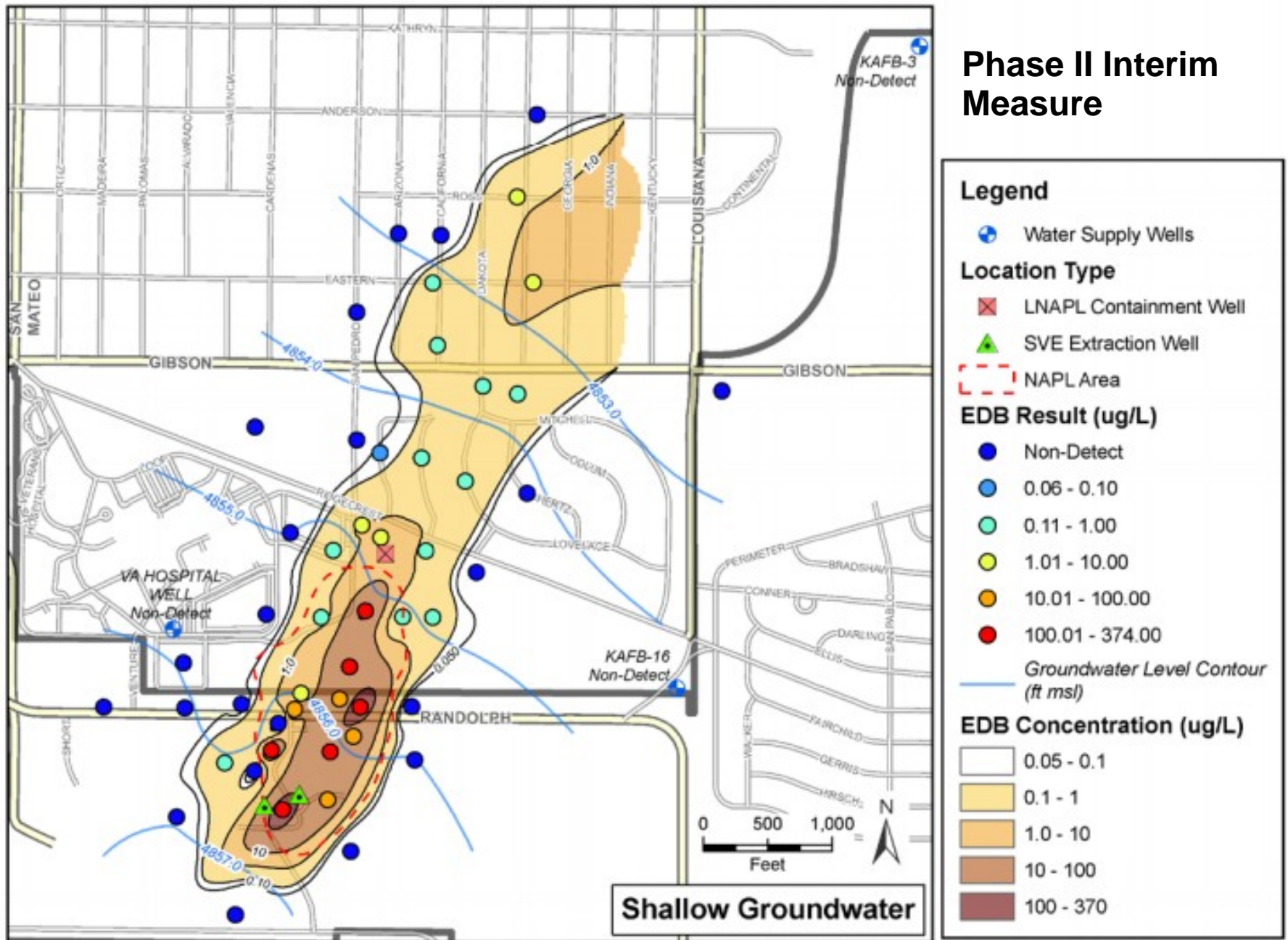
Hydrocarbons from Jet Fuel

- LNAPL - light non-aqueous phase liquid.
 - Also called PSH – phase separated hydrocarbon
- It floats on top of the water in the underground water table

Contaminants in the LNAPL

- EDB - 1,2-dibromoethane/ethylene dibromide – known carcinogen, can cause liver, stomach and nervous system problems
- Others

Phase II Interim Measure



KAFB– Bulk Fuels Facility

Recommended ways to monitor and clean it up

- Install monitoring wells (ongoing since 1999)
- LNAPL Containment Well Installation (Dec 2011)
- LNAPL Treatment System Installation (Feb 2007, Spring 2012)
- Soil vapor extraction well and unit installation (2000, Spring 2012) – may not work well for jet fuel
- Soil Excavation at source (Spring 2012)
- Natural Bioremediation – feeding bacteria



As you go throughout your week, think about the things you use that may have been influenced by a geologist.
You might be surprised!