What is GoNM?
What is GoNM?

• GoNM – Geographic Information System Screening Tool of New Mexico

• A GIS tool that rates 2 types of risks for gas stations: what is the potential risk for a leak and what risk would it cause to the environment.

• Basic tool developed by EPA R6.

• NMED further developed the tool for 4000 USTs at 1275 facilities and 1825 LUST sites.
Why was GoNM Developed?

- EPA mandates inspection of all facilities once every 3 years.
- NM is the 5th largest state and only 9 inspectors.
- Prioritize where additional resources are needed.
- GoNM show at risk stations- frequent visits.
- Low risk sites only need less frequent visits.
- GoNM contains valuable data on corrective action.
- Great communication tool.
- Consistent methodology.
- Flexible.
How was GoNM developed?

• VBA migrating to Java. Spatial Analyst required.

• ¼ mile buffer area around a gas station used in the analysis.

• GoNM uses feature classes to rate a risk.

• Original EPA R6 program had only 2 layers: Landscape, physical surroundings, and Community, demographics.

• NMED, PSTB added Facility, maintenance and equipment, and LUST Ranking Layers. All Facility criteria is from OneStop, PSTB UST database.

• Criteria and corresponding scores from each layer are rated from 1 – 5: a score of 1 implies the least risk while a score of 5 implies the greatest risk.

• All layers and criteria can be modified.
How was GoNM developed?

- The criteria scores for a layer are averaged together to determine a score for that layer.

- Each of the 3 layer scores are averaged together.
  - A low score suggests a facility is well maintained and/or located in an environmentally less sensitive area.
  - A higher score suggests a poorly maintained facility and/or located in an environmentally sensitive area.

- The LUST Ranking Layer is scored separately from the 3 layers using a sophisticated algorithm.
How was GoNM developed?

Landscape Criteria

- Surface Water Use
- STORET Exceedances
- Rainfall
- Average Flow
- Aquifer Geology
- Distance to Water
- Road Density
- Nonattainment
- Stream Density
- Channel Canal Density
- Surface Water
- Aquifer
- Wildlife
- Agriculture
- Wetlands
- Land Use Ranking
- Unified Watershed Assessment

Area Perimeter Ratio
Year Flood 100
Year Flood 500
TRI Releases to Air
TRI Releases to Water
TRI Releases to Land
TRI Toxicity Releases to Air
TRI Toxicity Releases to Water
Groundwater Probability
Soil Permeability
How was GoNM developed?

Community Criteria

- Population Density
- Economically Stressed
- Without High School Degree
- Children Under 7
- Older 55
- Children Under 1
- Unemployed
- With Low to No Ability to
  Speak English
- Linguistically Isolated
- Foreign Born
- Regulated Facility Count
How was GoNM developed?

Facility Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank Age</td>
<td>Number of Tanks</td>
</tr>
<tr>
<td>Cathodic Protection – Tank</td>
<td>Frequency of Inspections</td>
</tr>
<tr>
<td>Cathodic Protection – Piping</td>
<td>Facility History</td>
</tr>
<tr>
<td>Overfill/Spill Protection</td>
<td>Tank Contents</td>
</tr>
<tr>
<td>Piping Construction</td>
<td>Tank Capacity</td>
</tr>
<tr>
<td>Tank Construction</td>
<td>UST Pumping System</td>
</tr>
<tr>
<td>Tank Status</td>
<td>LUST Site</td>
</tr>
<tr>
<td>Release Detection – Piping</td>
<td></td>
</tr>
<tr>
<td>Release Detection – Tank</td>
<td></td>
</tr>
<tr>
<td>Equipment Maintenance Records</td>
<td></td>
</tr>
</tbody>
</table>
How was GoNM developed?

Lust Ranking

Using the criteria on the following slides each LUST site is determined to be a Priority 1, 2, or 3.

• Priority One: Actual or imminent risk to a receptor (municipal well, domestic well, river, or creek); imminent hazard to public health, safety, and welfare or the environment.

• Priority Two: Product, NAPL, at the site or saturated soils (involves treatment of saturated soils).

• Priority Three: Dissolved phased contaminants in the groundwater that are above ground water standards.
How was GoN M developed?

Lust Ranking

**Land/Water Use**
- Residential property within 400’ of source?
- Site within designated source water protection area?
- Irrigation well within 1000’ of source?
- Surface water body within 500’ of source?
- Private well within 1000’ of source?
- Public well within 1 mile of source?
- Ambient water quality

**Groundwater and Dissolved Phase Plume**
- Concentration
- Vertical downward gradient?
- Contaminant plume off-site?
- Mobility of plume
- Area of benzene>10ug/l
- Depth to groundwater in feet
How was GoNM developed?

Lust Ranking

Soil/Vadose
Volume of petroleum contaminated soil above RBSL or SSTL
Contamination off site?
Concentrations of Contaminants of Concern, COC, for surficial soil.
Concentrations of COC for leaching pathway.
Concentrations of COC for subsurface soil (indoor air) pathway.
Concentrations of COC for construction worker pathway.
Building overlies petroleum contaminated soil?
   If yes, what type of building? Residential or commercial
How was GoNM developed?

Lust Ranking

Non-Aqueous Phase Liquid (NAPL)
- NAPL Type: AV Gas, Gas, Diesel/Jet Fuel, Oils, Other
- Age of Release
- Product (NAPL) found off site?
- Area of NAPL plume
- Mobility of NAPL plume
- Current maximum thickness of NAPL in monitoring well
- Condition of NAPL
How was GoNM developed?

Lust Ranking

Contaminant Saturated Soil (CSS)
CSS Type: AV Gas, Gas, Diesel/Jet fuel, Oils, Other
Age of Release
Volume in cubic yards
Product (CSS) found off site?
How was GoN M developed?

Lust Ranking

Priorities and Ranking
- Impacts to Human Health, Safety & Environment
- Explosive Vapors
- Toxic Vapors
- Concentrations of COCs in water supply
- Water Supply Type
- Population affected by water supply impact (in numbers)
- Difficulty of replacing water supply system
- Ecological Damage
- Property Damage
GoNM in Action

- This is the work product of GoNM.
- GPS all features at a gas station.
- This map is a great asset to the inspectors. If there is a turn over due to retirement or realignment of territory this help to familiarize them with the facility.
  
- Used by owner/operator for required maintenance plan.
- Used by Project Manager for release analysis.
GoNM in Action

- Calculates data for a user defined buffer.
- Captures any changes that have been made to OneStop.
- Crunches or performs the analysis update from Facilities Update ahead of time for all 3 layers.
GoNM in Action

• New Mexico with many layers turned on.
• NLCD – National Land Cover Dataset
  • Green- both deciduous and evergreen forest
  • Yellow-shrub/scrub
  • Pink-open space
• I-40 & I-25 are visible

• Facilities visible as small blue dots
• LUST visible as small gray squares.
GoNM in Action

When the curser hovers over a facility or a LUST site an information box pops up with the name, facility ID, and address.
GoNM in Action

• Click on GoNM Reports.

• Enter a Facility ID in the box to the right.

• Click on the Search button.
GoNM in Action

• The data is automatically filled in once the Search button is engaged.
• The buffer area can be changed as needed.
• This is both an active facility and a LUST site.

• Click on Generate report.
GoNM in Action

• A report is generated showing the
  • LUST Ranking, score, and the priority.

• Scores for each of the layers – Landscape, Community, and Facility – are shown.
• Score for the average of the 3 layers is also displayed.

• An improved report is available with the GoNM Mapper.
GoNM in Action

- Great tool for outreach and community meetings.
- Interstates are visible.
- NLCD shows the green of Sandia Mountains east of Albuquerque and the Rio Grande.
- Red is high intensity developed.
- Medium pink is medium intensity developed.
- Pale Pink is low intensity developed.
- Analysis site is visible by buffer where the analysis takes place.
GoNM in Action

• A close up of the site in ArcMap
GoNM in Action

http://gis.nmenv.state.nm.us/GoNM
How to Use GoNM

Click the box next to the description to turn layers on and off.
How to Use GoNM

Zoom In, draw a box around the area where the facility is located

Fixed Zoom Out to see all of New Mexico
How to Use GoNM

Use Zoom In to get a close up of the area you want to see.
How to Use GoNM

Use the Identify Tool and click on a facility.
How to Use GoNM

Click on the magnifying glass under Report
How to Use GoNM

Values with “UNK” often signify there was no data entry for a tank detail. There are situations where UNK is appropriate. If a detail is not filled in, “UNK” will be the default in that field with a score of 5. All items need to be filled in. A score of 5 could give the facility a worse score than it deserves.
What Has GoNM Taught Us?
What Has GoNM Taught Us?

- A system for QA/QC is necessary.
  - GoNM lets us easily see bad data.
- Where do we need to focus?
  - Owner/Operators with the most leaks
  - Equipment with most leaks
  - Increase Inspection Rate – where do the inspectors need to be on a more frequent schedule
  - Corrective Action that is best for this type of leak
  - Location – where the leaks are most likely to occur.
Next Steps for GoNM

• Benefits
  • Great tool for community meetings and outreach.

• Electronic Inspections for the future

• Other States encouraged to start a program
GoNM will continue to work miracles

- GoNM is a work in progress.
- The hardest part is over.
- It will continue to evolve with our needs and innovations.
- It can be customized to meet the *fundamental* demands of other programs in NMED or any other program anywhere.

GoNM->GoUSA->GoEarth->GoMilkyWay
GoNM Acronym Reference

UST – Underground Storage Tank
NMED – New Mexico Environment Department
LUST – Leaking Underground Storage Tank
STORET - STOrage and RETrieval Data Warehouse is a repository for water quality, biological, and physical data and is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others.
EPA R6 – Environmental Protection Agency Region 6 – New Mexico, Oklahoma, Arkansas, Texas, and Louisiana.
GoNM – Geographic Information Screening Tool of New Mexico
BTEX – benzene, toluene, ethylbenzene, and xylenes
NAPL- Non-Aqueous Phase Liquid
TRI – Toxic Release Inventory
PSTB – Petroleum Storage Tank Bureau
COC – Concentration of Concern
CSS - Contaminant Saturated Soil
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