

SmartDG+

Tool for Distributed
Generation and
Renewable Energy
Projects



USER GUIDE

INTRODUCTION

SmartDG+ is a public, online, interactive map-based screening tool sponsored by Maryland Power Plant Research Program (PPRP), a division of Department of Natural Resources (DNR), with support from Maryland Energy Administration (MEA) and Maryland Department of Commerce (MDOC). It is intended to help developers and officials identify promising areas for the location of new wind and solar projects in Maryland. The tool focuses on screening factors of relevance to large-scale projects (i.e. greater than 2 MW.)

In order to create SmartDG+, PPRP evaluated electrical lines throughout Maryland, gathered publicly available data on barriers to project construction, and met with county and utility officials to discuss local priorities and policies of relevance. Combining this information is intended to help everyone save time and make better decisions about where to focus further research.

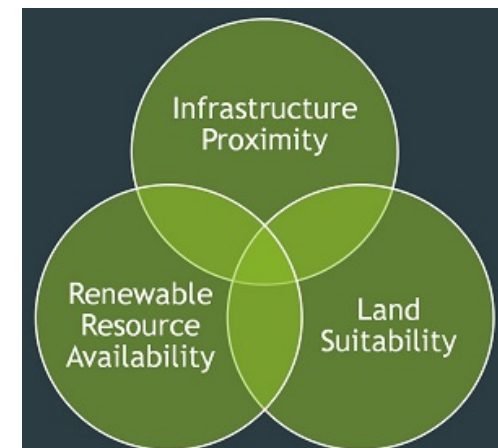
The linchpin of SmartDG+ is a statewide map of 1-to-4 mile-wide corridors surrounding electrical distribution and transmission lines that appear strong enough to absorb large-scale projects. Within these corridors, the tool shows areas that remain promising after various standard screens involving resource availability, land use, protected areas, and more have been applied. The screening results are shown as technology-specific data layers: Possible Areas for SOLAR; and Possible Areas for WIND.

This User Guide provides more information on how to operate the Smart DG+ tool and the functionality it provides.

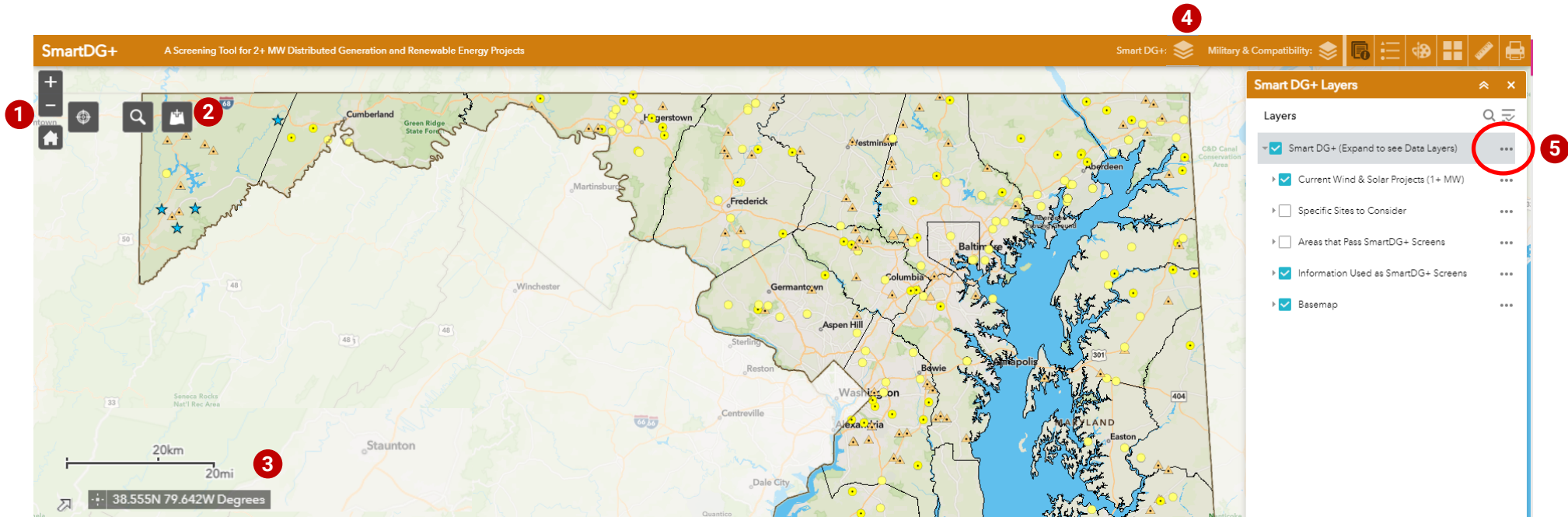
Software Requirements

The **Smart DG+ Tool** has been tested and is compatible with both Firefox 97 and Google Chrome 97. For best performance, avoid operating the tool using Internet Explorer or Edge. The Print to PDF function has been tested using Adobe Acrobat Reader release 20.004.30020. The Excel button has been tested using Microsoft Office 365.

- Infrastructure Proximity:
 - Electricity lines
- Renewable Resource Availability:
 - Viable wind speeds
- Land Suitability:
 - Protected areas
 - Flood zones
 - Land cover/land use
 - Airports
 - DOD no-go zones
 - County zoning




OVERVIEW



Web Tool Features

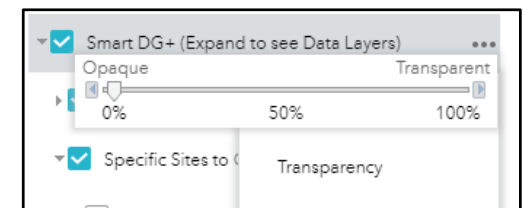
- 1 Navigation:** This set of buttons allow the user to navigate around the map; ZOOM IN, ZOOM OUT, and HOME (default extent). The mouse can also be used to zoom in, out, and pan around. Left mouse click to pan and use the wheel to zoom in and out.
- 2 ADD Data:** This button provides the user with the ability to ADD their own data on top of the robust data set within SmartDG+. This data can only be seen by the user and remains private.

- 3 Coordinates:** In the lower left-hand corner of the site is a scale bar and coordinates in decimal degrees. When inquiring about coordinates of a specific location, simply hover the mouse over the desired area and the coordinates will be reflected in the tool.

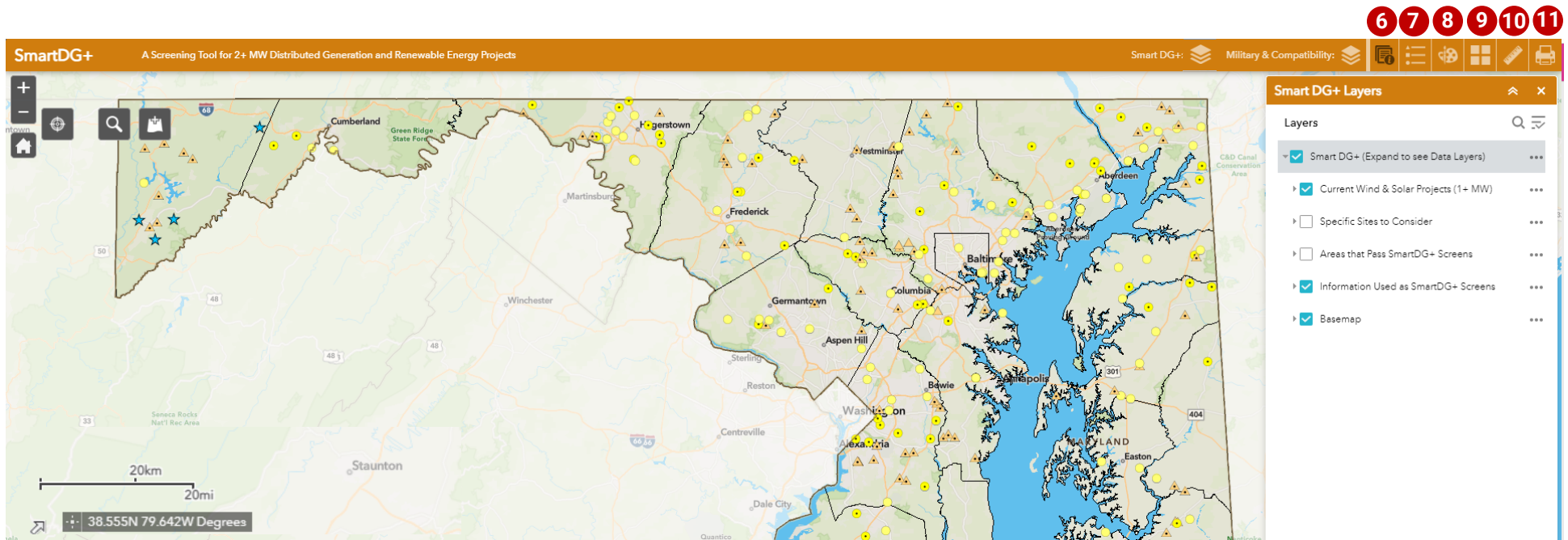
- 4 SmartDG Layers:** By clicking on this, the list of layers will appear. Expand layers by clicking  Turn layers on and off by clicking the box next to the layer Layer On Layer Off

Note: Higher items in the Layer List will show up 'on top' of lower items. In some cases, it is necessary to turn off one layer to see information 'beneath' it.

- 5 Transparency:** Within LAYERS, there is a TRANSPARENCY tool. This adjusts the transparency of all layers at one time to make the basemap visible below the features. By clicking on the 3 dots to the right of 'SmartDG+ (Expand to see Data Layers)', a new menu appears. By selecting Transparency, a slide bar becomes visible to adjust the transparency.



OVERVIEW

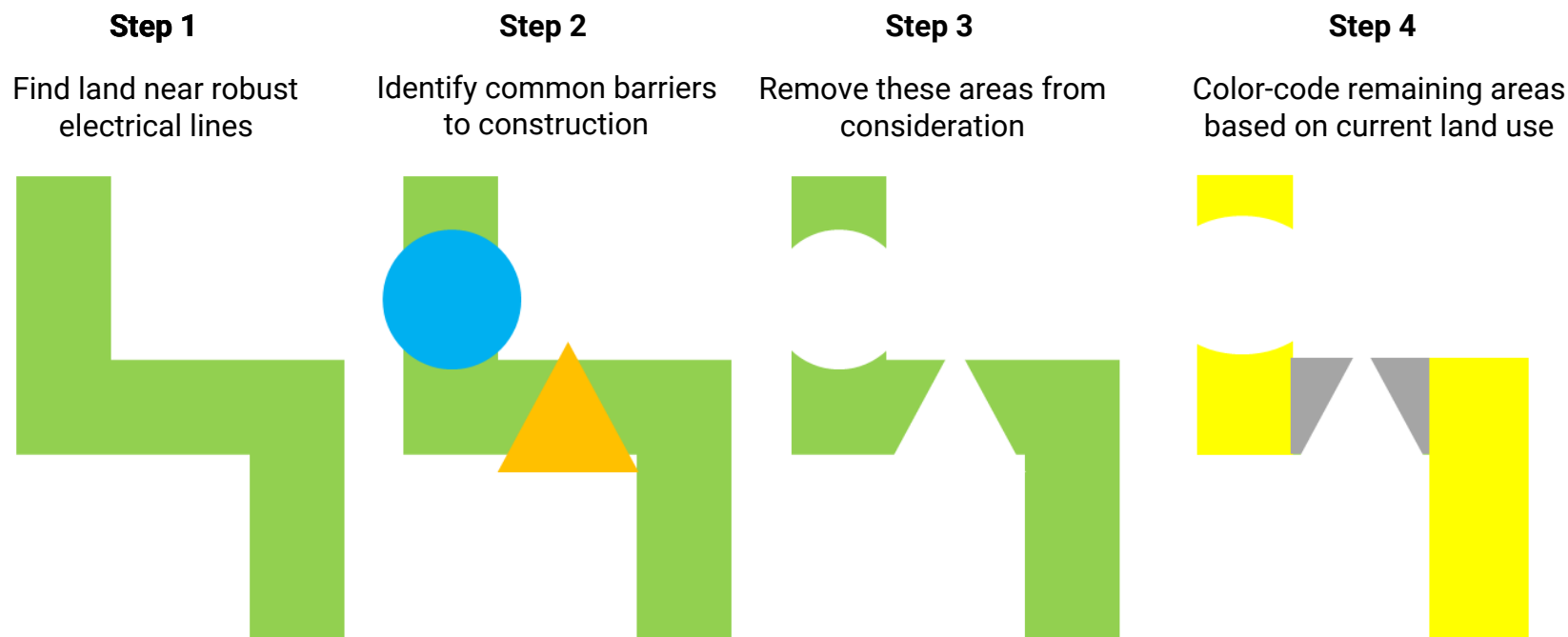


Web Tool Features

- 6 Supporting Documents:** This button contains several helpful documents, including 'Data Descriptions', which contains a short summary of each data layers in SmartDG+ as well as the source.
- 7 LEGEND:** By clicking on this, a legend will appear that includes any layers that are turned on at the time. Simply click the X to close out of it. The legend will also appear on the map when exporting to PDF or printing.
- 8 DRAW:** This enables the user to draw a line or polygon, which could be used to communicate areas of interest. The shape will be added to LAYERS with the ability to turn on/off and include in print-outs. Use the CLEAR button to remove.
- 9 BASEMAP GALLERY:** This provides a list of basemaps available. Select one and the base-map will change depending on your need.
- 10 MEASUREMENT:** This enables the user to calculate distance and area. It also provides coordinates for point locations.
- 11 PRINT:** This enables the user to make a map of the extent and layers that are user specific. Select a title and size to export a PDF.

SCREENING PROCESS

In order to make use of SmartDG+, it helps to understand the basic screening process that was used.

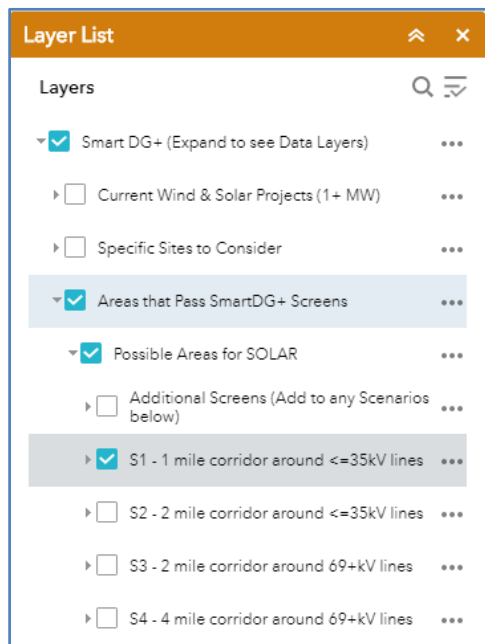


SCREENING PROCESS

SmartDG+ provides the information that PPRP used *during* the screening process, and the *results* of the screening process—as well as bonus information, such as landfills and wastewater treatment plants, where DG projects are often located. In most cases, data used for screening purposes came from Maryland state agencies and reflect some level of generalization. For data layer details, please see Data Descriptions on page 4.

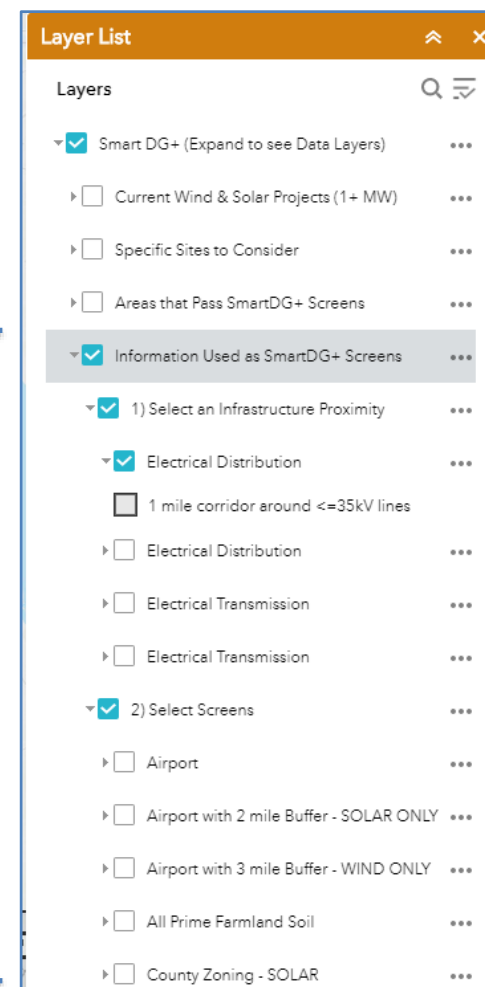
There are two options of viewing the data:

- 1) Pre-run screening results or
- 2) User-selected screening



Viewing Option 1
Results of the basic screening process. Users can add optional screens.

Viewing Option 2
Information used during the screening process. User adds screens individually.



SCREENING PROCESS

Viewing Option 1 – Pre-screened Results

1. How to see areas that passed SmartDG+’s standard screens for solar projects.

Turn on Areas that Pass SmartDG+ Screens and click the arrow to its left. Turn on Possible Areas for Solar and click the arrow to its left. A drop-down menu will appear with four scenarios to choose from: S1, S2, S3, and S4. (A layer at the top of the list, titled Additional Barriers, is discussed in the next section.) S1 and S2 are for those interested in 2-3 MW projects. They show areas within 1/2 mile and 1 mile of a 3-phase distribution line. S3 and S4 are for those interested in 3+ MW projects. They show promising areas within 1 and 2 miles of a transmission line, respectively. (Note: Only turn on one scenario at a time. Otherwise, information from one scenario may “block” information from another scenario.)

2. How to add additional screens for solar projects.

Once you have chosen and turned on one solar scenario (S1, S2, S3, or S4), click the arrow to the left of Additional Screens. A dropdown menu will appear with seven optional screens: County Zoning Restrictions, County Protected Lands, MALPF Easements (Maryland Agricultural Land Preservation Foundation), Forested Lands, NAS Pax River Areas of Concern, Heritage Areas, and Prime Farmland Soil. You can turn on any/all of these optional screens at once. If any of these barriers apply to the area you are viewing, this area will become faded, but will still be visible.

2a. A note about County Zoning Restrictions

Many of Maryland’s counties have passed regulations to guide the siting of 2+ MW wind and/or solar projects. Usually, this guidance lists zoning districts where such projects would be permitted, and notes any special requirements that must be met. SmartDG+ simplifies matters by excluding areas where county zoning prohibits all 2+ MW wind or solar projects. Beyond this, further research will be needed to understand the specific nature of each county’s regulations. Also, within municipalities, additional/other rules may apply. (Note that the Maryland PSC has the ultimate authority to approve 2+ MW projects throughout Maryland.)

2b. A note about NAS Patuxent River

Naval Air Station Patuxent River has issued maps showing where proposed wind or solar projects would need to be reviewed by Pax River officials. The first map shows a High Risk of Adverse Impact Zone (HRAIZ) for wind projects. The second map shows two smaller, circular Areas of Concern for solar projects around both Pax River and nearby Webster Field. Anyone considering development in these areas should contact Pax River at (301) 757-4822 christopher.jarboe@navy.mil or the DOD Siting Clearinghouse at osd.dod-siting-clearinghouse@mail.mil.

SCREENING PROCESS

Viewing Option 1 – Pre-screened Results

3. How to see areas that passed SmartDG+'s standard screens for wind projects.

Turn on Areas that Pass SmartDG+ Screens and click the arrow to its left. Turn on Possible Areas for Wind and click the arrow to its left. Then follow steps analogous to those described for solar, except using wind scenarios (W1, W2, W3, or W4).

Viewing Option 2 – User-selected Screens

1. How to see what areas are near robust electrical or gas lines.

Turn on *Information Used as SmartDG+ Screens* and click the arrow to its left. Turn on *Select an Infrastructure Proximity* and click on the arrow to its left. Select whichever type of electrical line (distribution or transmission) and corridor (1, 2 or 4 miles) is of interest for your project. A 2-3 MW project will usually connect to a distribution line. A 3+ MW project will connect to a transmission line. (Definitions of the distribution and transmission lines vary. In SmartDG+, distribution refers to lines <35 kV and transmission refers to lines >69 kV.)

2. How to see where there are barriers to 2+ MW generation projects.

Under *Information Used as SmartDG+ Screens*, turn on *Select Screens* and click the arrow to its left. Each barrier (e.g., protected areas, flood zones, high density residential areas, etc.) is a separate layer. Some apply only to one type of technology.

SmartDG+

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Energy Projects

**Smart DG+ Tool is maintained by the
Maryland Department of Natural Resources, Power Plant Research Program.**

For questions about the SmartDG+ Tool, contact:

Maryland Department of Natural Resources, Power Plant Research Program

Phone: (410) 260-8660

Email: pprp.dnr@maryland.gov

Address: Tawes State Office Building
Annapolis, Maryland 21401

Military & Compatibility
Layers of the
Smart DG+ Tool



USER GUIDE

The **Military & Compatibility Layers of the Smart DG+ Tool** provide military and other federal, state, and local stakeholders with information to help develop renewable energy projects within the State of Maryland. The tool compiles a variety of GIS layers related to military operational areas and renewable energy development, throughout the state, as well as contact information for the relevant agencies for siting coordination. The tool allows the user to create custom areas of interest, or upload custom areas, that will output a list of relevant agencies to contact and every layer that intersects the custom area. The user can then save a report of these results as a PDF, Excel workbook, or as an HTML file.

The **Military & Compatibility Layers of the Smart DG+ Tool** starts with a map view, which also serves as the search page. When the user clicks on the military and compatibility layers, a disclaimer splash screen with information on the purpose of the layers, and contact information for the map tool will display. Clicking on Confirm will close this splash screen.

The initial map view of the **Military & Compatibility Layers of the Smart DG+ Tool** will display military installations and areas where military operations are conducted across the state.

Additional layers may also be selected and toggled on or off:

- Existing structures within Maryland airspace including wind turbines, communication towers, transmission lines, and radars
- Areas of energy development opportunity including solar and wind potential
- Land ownership including Jurisdiction boundaries, Maryland Department of Natural Resources lands, State protected lands, U.S. Fish & Wildlife Service protected lands, and National Park Service boundaries
- Environmental & Cultural Resource areas
- Location Reference Systems used by the military and map projection system for assigning location coordinates

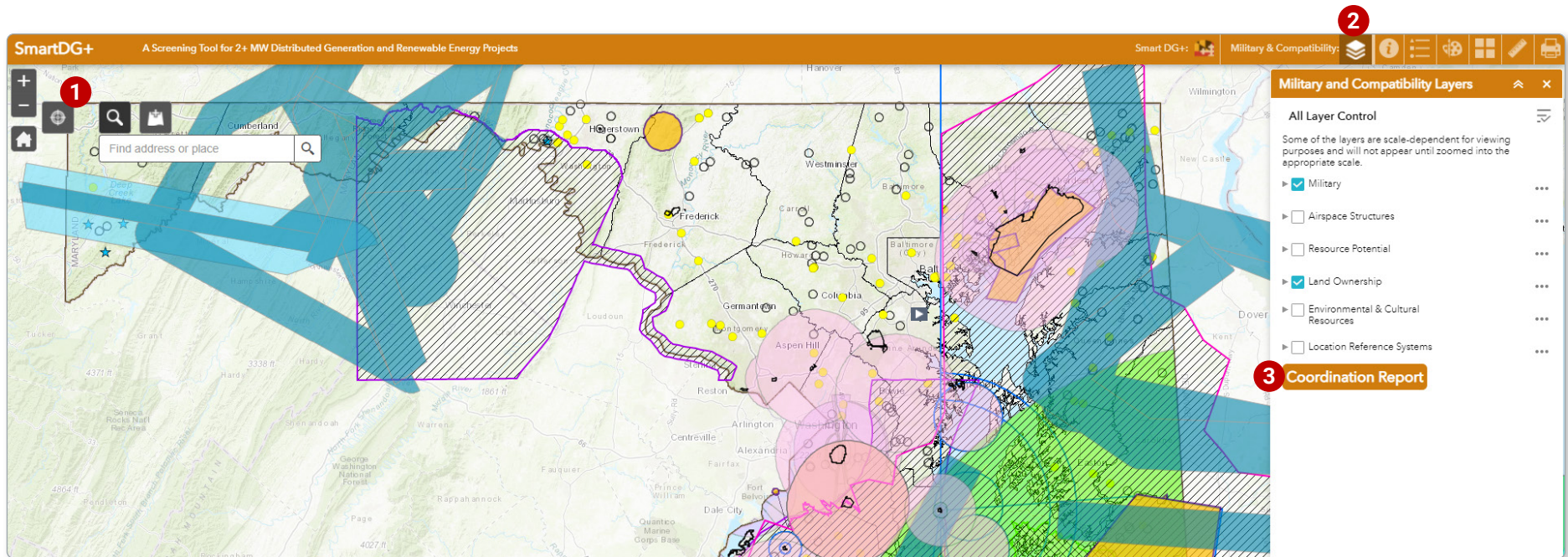
The Coordination Report button, located at the bottom of the Military & Compatibility Layers table of contents, is the primary way to interact with the military and compatibility data layers. Using the Coordination Report function, the user can drop a point, draw a shape, or upload data on the map to perform a custom search query to identify military operations and other features at that location. If a user uploads data on the map, the data will appear in the User Added Layers grouping. When the search is complete, the Coordination Report tool will switch from the Identify tab to the Results tab where individual features that intersect with the search area will be listed. The View/Print button will turn this into a report in a new window, which can then be saved or printed.

This User Guide provides more information on how to operate the Military and Compatibility layers of the Smart DG+ tool.

Software Requirements

The **Smart DG+ Tool** has been tested and is compatible with both Firefox 97 and Google Chrome 97. For best performance, avoid operating the tool using Internet Explorer or Edge. The Print to PDF function has been tested using Adobe Acrobat Reader release 20.004.30020. The Excel button has been tested using Microsoft Office 365.

OVERVIEW



Web Tool Features

- 1 Reset Layers:** Selecting this button will revert to the layers originally displayed upon first visiting the tool. Any layers that the user previously turned on will be turned off.
- 2 Military & Compatibility Layers:** Activates table of contents for military and compatibility layers. Upon activation, a disclaimer splash screen will appear. The disclaimer states the intent and limits of the tool. Upon clicking confirm, a predetermined selection of military layers

appear on the map. Selecting cancel will prevent the table of contents from opening. Within the Military & Compatibility Layers table of contents, the user can toggle individual layers on and off, view associated legends, and expand and collapse the layers. The three dot icon to the right of each layer, also known as the “context menu,” can be used to reorder layers, zoom to a specific layer, adjust layer transparency, and enable/disable the pop-up. The context menu also allows the user to run a Coordination Report

on any of the geometries in the individual layers. This is particularly useful when the user uploads their own data.

- 3 Coordination Report:** This button will launch the Coordination Report Menu on the left-hand side of the screen. For more information on creating a Coordination Report, see the next page of this User Guide.

CREATING A COORDINATION REPORT

SmartDG+ A Screening Tool for 2+ MW Distributed Generation and Renewable Energy Projects

Coordination Report

Identify Results

Create a Coordination Report

Filter from layer(s):

All Layers

Draw an area or upload a shape for the area you would like analyzed. Only one geometry type, such as points or areas, may be drawn at a time. Erase the drawing to return to the default options.

1 Identify **2** ?

Create a Coordination Report **2** ?

3 Filter from layer(s):

All Layers

Draw an area or upload a shape for the area you would like analyzed. Only one geometry type, such as points or areas, may be drawn at a time. Erase the drawing to return to the default options.

4 **5** **UPLOAD**

Add Data

a Generalize features for web display

b ?

SHAPE FILE CSV KML Geo JSON

DROP OR BROWSE

c BROWSE

Step 1: Creating Area of Interest

You may create a proposed area of interest that will overlay the map. This can be done either by drawing directly on the map or by uploading data.

- 1 Identify Tab:** Tools for starting a new search query.
- 2 Info:** Information about the tool.
- 3 Filter from layer(s):** Isolate the search query to run on only one layer using a drop down menu.
- 4 Draw buttons:** Allow user to draw a shape which will define the search directly into the map view area.
- 5 Upload:** Launches a new Add Data popup that allows you to add an area of interest of your own.
 - a Generalizing:** Generalizes features for faster display.
 - b Info:** Information about the tool.
 - c Browse:** Navigate to file location. You can upload your area of interest in the following file formats:
 - Shapefile:** Must be zipped to upload. Can contain multiple features.
 - KML (Google Earth):** KML only, KMZ files are not compatible. To convert from KMZ to KML, unzip the KMZ document using a zip software.
 - CSV, GPX, and GeoJSON** are also acceptable data formats.

Once a file has been uploaded, a message box will appear and will allow you to run the coordination report. If you select "No", the report can be run from the context menu of the layer in the View the Data Layers window.

CREATING A COORDINATION REPORT

SmartDG+ A Screening Tool for 2+ MW Distributed Generation and Renewable Energy Projects

Find address

Coordination Report

Identify Results

Create a Coordination Report

Filter from layer(s):

All Layers

Draw an area or upload a shape for the area you would like analyzed. Only one geometry type, such as points or areas, may be drawn at a time. Erase the drawing to return to the default options.

Click to add a shape, or press down to start and let go to finish

Coordination Report

Identify Results

Create a Coordination Report

Filter from layer(s):

All Layers

Draw an area or upload a shape for the area you would like analyzed. Only one geometry type, such as points or areas, may be drawn at a time. Erase the drawing to return to the default options.

UPLOAD

Coordination Report

Identify Results

Results found: 90 [View / Print](#) [Clear](#) [Clear Selection](#)

Installation Coordination Area

Name: Adelphi Laboratory Center

Contact: Elana Messner

Position: Master Planner

Phone: (410) 278-0927

Email: elana.messner.civ@mail.mil

Installation Coordination Area

Name: Naval Support Activity Bethesda

Contact: Shawna Lemonds

Position: Community Planning Liaison Officer

Phone: (301) 295-5787

Email: Shawna.lemonds@navy.mil

Helicopter Operations

1 **2** **3**

Step 2: Running a Query

Once you have identified your area of interest on the map by drawing a shape or have uploaded your area of interest through the upload link, three options are presented to you:

- 1 Get Results:** Run query on area of interest.
 - a** Once clicked, the Coordination Report panel will switch from the Identify tab to the Results tab with a list of the results in your selected area of interest for you to view/print.
- 2 Export Drawn Area:** Save area of interest as a GeoJSON file for later use.
- 3 Erase Drawing:** Clear all features to start over.

COORDINATION REPORT RESULTS

Viewing/Exporting Report Results

- 1 Results:** Shows a list of features that intersect the area of interest.
 - a** Clicking on a feature in the Results Tab will pan to the area of interest and display the contact information associated with that feature.

Note: This tool can return results that are not currently visible on the map, including points of contact who do not represent military operational areas, but which still intersect the area of interest.
- 2 View/Print:** Launches a new page listing every feature that intersects the search area:
 - b PDF (or Print):** Allows for printing the results page or saving it as a PDF. Be sure to enable print background in your browser settings to preserve the table color shading when printing hardcopies.
 - c HTML:** Allows for saving the results page as an HTML file.
 - d Excel:** Exports the reports table to a new Excel workbook. The resulting Excel file will prompt the user with a message upon opening. Confirm “Yes”, click the “Enable Editing” button in the ribbon.

Note: Depending on the browser used, the above features may cause the Coordination Report window to close. The user will be reverted to the map. Clicking the View/Print button again on Results tab will reopen the Coordination Report window.
- e Map, including points of contact who do not represent military operational areas:** Screenshot maps of the area of interest.
- f Results:** Scroll the page down for a table of the intersecting features, as well as contact information for the relevant responsible agencies.

Note: Contact information may be repeated if the POC is responsible for multiple sites.

- 3 Clear:** Removes the drawn shape and empties the results list.

Coordination Report

Results found: 2 **View / Print** **Clear** **Clear Selection**

Installation Coordination Area
 Name: JBA Davidsonville Transmitter Site
 Contact: Krist Zimmerman
 Position: Community Planning Liaison Officer
 Phone: (540) 395-7045
 Email: kristofer.zimmerman.ct@us.af.mil

Installation Coordination Area
 Name: Naval Research Laboratory Chesapeake Bay Detach
 Contact: Karsten Koch
 Position: NRL Strategic Integration
 Phone: (202) 767-2928
 Email: karsten.koch@nrl.navy.mil

Military Training Route (Floor At or Below 500 feet)

Save As [PDF (or Print)] [HTML] [Excel]

Several assets, including installations, airspace, radars and additional operating areas are critical to the military for maintaining operational capability. Weather radars called NEXRAD, are also critical for weather forecast agencies. Early coordination among military agency, industry, and community stakeholders is effective for ensuring development is compatible with military operations and to minimize potential project delays and financial. Based on the area you selected, the following sections identify military assets that could be impacted, and other coordination information including points of contact. Coordination should occur as early as possible to discuss solutions.

For general questions or comments on compatibility contact the Maryland Department of Planning at (410) 767-4500.

For questions specific to compatibility with

- Aberdeen Proving Ground contact (410) 278-0927
- Annapolis Naval Academy contact (410) 293-1084
- Fort Detrick contact (301) 619-2441
- Fort Meade contact (240) 429-4491
- Joint Base
- Martin St
- Naval Res
- Naval Res
- Naval Sul
- Naval Sul
- Naval Sul
- Wallops F

Name	Contact	Position	Phone	Email
JBA Davidsonville Transmitter Site	Krist Zimmerman	Community Planning Liaison Officer	(540) 395-7045	kristofer.zimmerman.ct@us.af.mil
Naval Research Laboratory Chesapeake Bay Detachment	Karsten Koch	NRL Strategic Integration	(202) 767-2928	karsten.koch@nrl.navy.mil

Maryland

Military & Compatibility
Layers of the
Smart DG+ Tool

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For questions specifically about the SmartDG+ Tool, contact:

Maryland Department of Natural Resources, Power Plant Research Program (410) 260-8660

For general questions or comments on military compatibility in Maryland, contact:

Maryland Department of Commerce, Office of Military and Federal Affairs (410) 767-6300

For questions specific to compatibility with military installations in Maryland, contact:

Aberdeen Proving Ground (410) 278-0927	Blossom Point Research Facility
Annapolis Naval Academy (410) 293-1084	Army Research Laboratory (410) 278-0927
Fort Detrick (301) 619-2441	Naval Research Laboratory (202) 767-3697
Fort George G. Meade (240) 429-4491	Naval Research Laboratory
Joint Base Andrews (540) 395-7045	Chesapeake Bay Detachment (202) 767-3697
Maryland Air National Guard	Naval Support Facility Bethesda (301) 295-5787
(Martin State Airport) (423) 946-4612	Naval Support Facility Indian Head (202) 754-6410

For questions specific to compatibility with military installations outside of Maryland on compatibility in Maryland, contact:

Delaware Air National Guard (302) 323-3554	Wallops Flight Facility (757) 824-2555
Naval Air Station Oceana (757) 433-9141	West Virginia Air National Guard (304) 445-7554
Naval Support Facility Dahlgren (202) 754-6410	