

# Instructions to Visualize Horse Heaven Hills Wind Farm

## Introduction

When a wind farm is first proposed, the almost universal reaction by people living in the affected community is “What will it look like from my home?” If there is a visual impact assessment, it will contain photorealistic simulations from a few viewpoints selected by the developer’s consultants. However, these viewpoints are selected by the developer’s team and it is almost certain that none of them are from your home.

The goal of these instructions is to get you up and running on Google Earth Pro to visualize the Horse Haven Hills Wind Farm from your home. One big reason to use Google Earth is that it is that the software is totally free and will run on any PC, Mac or Linux computer. After completing the steps discussed here you may want to explore the view from other locations, as well as other features of Google Earth Pro.

You will be looking at the layout for Option 1. The only spatial information available to the public is a PDF of a map you can download at:

[https://drive.google.com/file/d/1LAztlg\\_vdqAmMhnNGcRN1qklygIWcTRt/view?usp=sharing](https://drive.google.com/file/d/1LAztlg_vdqAmMhnNGcRN1qklygIWcTRt/view?usp=sharing)

This PDF also includes the layout for Option 2 with fewer but taller turbines. We were unable to prepare a KMZ for this option.

These instructions refer to Horse Haven Hills Wind Farm as HHH and Google Earth Pro as GEO.

## Step 1: Download and install Google Earth Pro

You need to open a web browser on your PC or Mac computer and go to:

<https://www.google.com/earth/about/versions/#earth-pro>

Select the “Download Earth Pro on desktop” box and then follow the instructions. This process should be straightforward—it is just like installing any other software. It will be installed where ever software is normally installed.

Once it is installed, you can open it by double clicking on it. GEO is a fun program. You can look a places all around the world, and even visit the moon and other planets.

## Step 2: Download the Horse Haven Hills Wind Farm KMZ

The 3D model of HHH’s Option 1 wind turbines is called HHH\_Opt\_1.kmz, or KMZ for short. Click on this link and select Download:

[https://drive.google.com/file/d/14-ZGS3nRxiJMLwaDg87hW\\_PY\\_6UPS\\_0X/view?usp=sharing](https://drive.google.com/file/d/14-ZGS3nRxiJMLwaDg87hW_PY_6UPS_0X/view?usp=sharing)

Put it away in a location that is easy for you to find on your computer—maybe create a folder for HHH Wind Farm on your desktop or in Documents and put it there.

### **Step 3: Open the HHH KMZ**

Double click on the HHH\_Opt\_1.kmz file and it will open in GEO.

There will be a floating window over the aerial map with tips about Navigating Google Earth. I encourage you to spend a few minutes learning how to navigate GEO. Read the tips that are listed and click on the blue phrase, “Learn more about how to navigate Google Earth.” You can “Sign In” if you have a Google account (e.g., you use Gmail), but it is not necessary. When you are ready to move on, close the floating window by clicking the Close button (leave the Show Tips at Start-up box checked). You can get the Start-up Tip and other instructions from the Help menu at any time. The more complete, though somewhat dated Google Earth User Guide is at: <http://earth.google.com/intl/ar/userguide/v4/index.htm>. In addition you can always Google for help with any questions you may have—there are lots of training videos and user advice on how to make the most of GEO.

**There are reference notes at the end of these instructions that identify GEO’s primary tools. Refer to these notes to understand the GEO terms used here.**

In the Places Panel in upper left side of the GEO window there is a folder named HHH\_Opt\_1 that has all the 3D information. Select (highlight) HHH\_Opt\_1. In the File menu, put the cursor over Save and then select Save to My Places. Now when you start GEO next time HHH\_Opt\_1 will already be installed. Do not click on the KMZ file again or it will be loaded twice. To remove HHH\_Opt\_1 from GEO, right click on it and select Delete.

Click on the greater than symbol (>) to see its contents.

- The **HHH IDs** are the turbine numbers shown in the Option 1 layout. Click on the greater than symbols to open the folders. The labels are Placemarks that have been color coded to reflect the impact on the PDF map: green for lowest impact, red for highest impact, yellow for impact to one resource and pink for impact to 2 resources. All the labels are turned on, but you can turn them off by clicking on the blue check box.
- The **KOPs** are the viewpoints used in the visual impact assessment. Double click on one to take you to an aerial view above the viewpoint. Position your mouse over a location and use the mouse’s scroll wheel to move down to the ground.
- Then there are four folders for the **Impact Classes** that contain the turbines. You can turn a whole impact class of turbines off or on by clicking on the blue box. If you open an impact class folder, the individual turbines are shown using the old ID numbers. You can turn individual turbines on and off too.

If you click on an individual turbine in the map or HHH IDs, a pop-up window lists the ID, the old turbine name, the impact class from the PDF map, and the turbine’s location and height to an upright blade tip.

Now you are ready to explore how the HHH wind turbines might appear from any location in the study area.

#### **Step 4: View from Your Street.**

We will start by seeing if the wind turbines will be visible from your home. In the Search panel of the Side Bar in the top left of the GEO window, type your home address and click Search. This will create a Placemark on the map and bring you to an aerial view of the address at an elevation a bit over 3,000 ft above the ground. Next we need to get down to a ground-level view.

Take the mouse cursor to the upper right side of the window and click-and-hold on the orange Pegman symbol. If the street in front or near your house turns blue, drag and drop Pegman's feet where you want the viewpoint to be. Viola! You are in Street View. At the bottom of the window is the date of the photograph, its latitude and longitude and elevation (ignore "eye alt"). The eye-level of all Street View photos is approximately 10 ft (3 m) or a bit higher than normal eye-level.

[There are alternate ways to get to a Ground View. You could simply click near the Placemark; keep clicking but not too fast, until you are at Ground View. Or you could hold the cursor/crosshairs over the location you want for a viewpoint and use the mouse scroll-wheel to get down to ground-level.]

Change to Terrain View by clicking on the building icon at the top of the Navigation Tools. Use the Look Around tool's left or right arrows to pan around the view while staying in place. (Do not use the up and down arrows or the Move Around tool yet.) Do you see any turbines? Pan until the largest turbine is in the center of the screen where it will be in proper scale.

**If you do not see turbines, finish reading the instructions for this step and then go to the next step.**

Expand the window to full screen size. Notice that the view stays the same—it is just larger. The view always defaults to approximately a 90° angle of view in both Terrain and Street View. The appropriate viewing distance for this view is half of its width, which is really close. If your eyes are that distance from the screen, the turbines will be appropriately scaled. Do not use the Zoom Tool because it changes the angle of view and then the appropriate viewing distance will be unknown.

Now move the mouse cursor to the upper right corner of the screen and switch back to Street View by clicking on the blueish Pegman icon. Check that the horizon in Street View matches the

horizon in Terrain View by switching back and forth. As you switch back and forth, note whether the vegetation and buildings in Street View would screen the turbines visible in Terrain View.

While not perfect, this gives you a good sense of whether the turbines will be visible from this particular viewpoint.

### **Step 5: Moving Around to See Turbines.**

The next question is how extensive are view of the turbine in your neighborhood. Use the Look Around tool to face a direction you want to move—or click-and-hold and swipe sideways to rotate the view. Move forward Street View by clicking on the forward or backward arrows, or to move forward faster, double-click on a location further down the road. Be patient—using mouse clicks to navigate can be finicky. If double-clicking does not work, use the mouse scroll-wheel.

In Terrain View you can move off the road (but there likely will not be corresponding Street View photos off the road). Rotate the view to the direction you want to go (the Move Around tool will show where north is relative to the direction you are facing). Then move straight forward using the scroll-wheel, or double-click on a location you want to move toward.

If you stay on the road, switching back and forth between the Terrain and Street Views gives you some idea of how often the turbines will be screened or not.

### **Step 6: View Settings to Improve the Visual Contrast.**

Sometimes it may be difficult to see the turbines with GEO's default settings, which do not include the variable effects of sun lighting. GEO can simulate sunlight for a specific time of day. When the turbines are front lit they will appear lighter, when they are backlit they will be darker. In the Tool Bar click on the Show Sunlight icon of the rising sun. It brings up a slider that controls the sun's angle for the time of day.

Another adjustment changes the sky to be lighter and more vibrant. In Windows, open the GEO Options in the Tools menu (In Mac, open Preferences in the Google Earth Pro menu) and check Photorealistic Atmosphere Rendering in the 3D View tab.

### **Step 7: Saving a Viewpoint.**

If you have found a view that you want to save so you can come back to it, you can do that in Terrain View. First use the Look Around tool to put the most prominent turbine in the center of the image and the horizon in the middle of the image. Then click on the Add Placemark tool (it looks like a yellow pushpin) in the Tool Bar. This brings up a window: type in the viewpoint name, and make sure that the Altitude is Clamped to Ground. Then click OK. It should be saved under My Places in the Places panel, though it may be somewhere else in the Places panel.

Now you can always get back to that view. Click the Exit ground-level view button in the upper right corner of the window (if it is not visible, just move around the view a bit). The Placemark become visible from an elevated view. Either double-click on the Placemark in MyPlaces, or double-click at the base of the Placemark to retrieve the view.

You can save a view as a .jpg file. In the File menu, select Save, then Save Image. Select Map Options to control the information displayed with the view. Click in the Untitled Map box to title the image. In the upper left corner is the Legend, and you can turn features that may be in the view on or off. Adjust the image resolution—the higher the better, though it means a larger file. Then click Save Image.

### **Step 8: Identifying Individual Turbines**

If you are going to submit comments to the EFSEC, then you may want to include images of a particular view. It may be useful to refer to the individual turbines on the Option 1 map that concern you in the view. This is the primary reason for including the HHH IDs in the KMZ.

The HHH IDs may not always show in Terrain View. If you click and drag the Terrain View downward, they may appear. You can also click Exit Ground-level View, but then you need to keep track of which turbine interested you.

### **Step 9: Evaluation of Google Earth Pro Visualizations**

Widely distributing a GEO KMZ is a new approach to help a community understand how a proposed wind farm may change the landscape. We invite you to take a short 10 minute survey to help us learn about whether it was helpful or not. Your participation is completely voluntary and you may decline to answer any of the questions or stop at any time. Your responses are completely anonymous.

If you agree to participate in the evaluation survey, click on the link below to be taken to a Google Forms questionnaire.

<https://docs.google.com/forms/d/e/1FAIpQLSc1i3RV8JxWOq-q4jG5nXFmh9hk8ueVsnCirbe3CHBlqp-ong/viewform?usp=sharing>

We appreciate your participation in this evaluation of Google Earth Pro as a visual impact visualization too.

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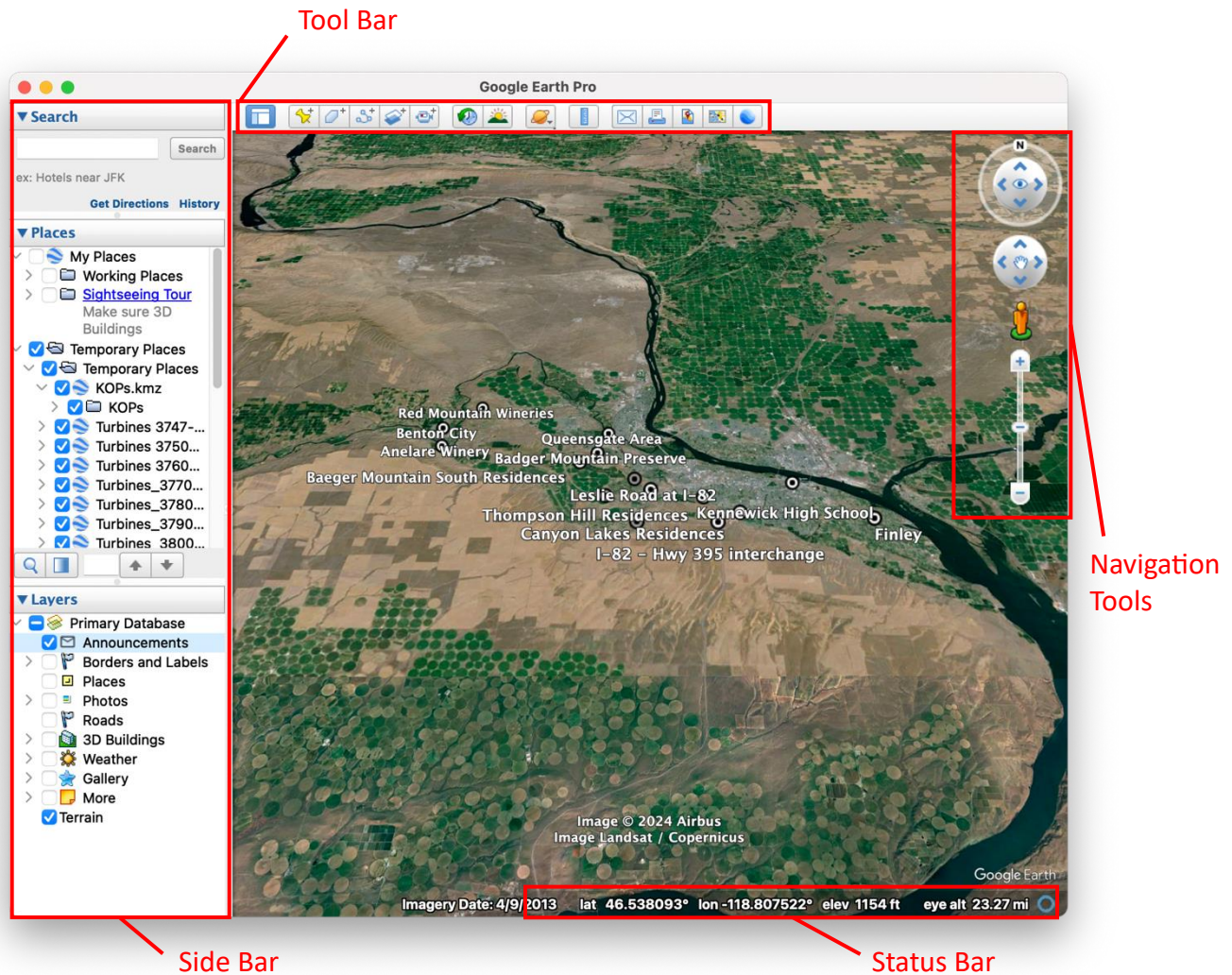
# Google Earth Pro Reference Notes

## Introduction

These notes locate the basic tools needed to get around in Google Earth Pro. I am using a Mac, so the images may be slightly different on a PC. The somewhat out of date Google Earth User Guide is at: <http://earth.google.com/intl/ar/userguide/v4/index.htm> .

## Home Screen

Then you double-click on HHH\_Turbines&KOPs\_FINAL.kmz, you will see a screen something like that shown below.



The **Side Bar** includes three panels which are collapsed or expanded by clicking on the triangle or caret mark.

- **Search.** Locate your home or any place in the world.
- **Places.** This is where **Placemark**s are kept. The KMZ has Placemarks for the turbines and the visual impact assessment photosimulation viewpoints.

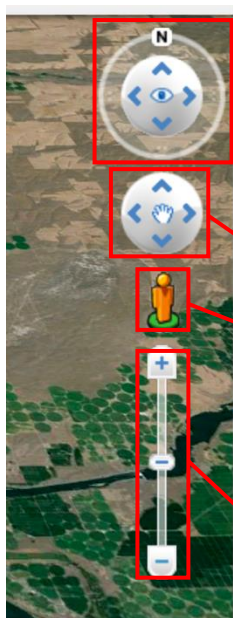


- **Layers.** This panel contains various map features, such as roads, terrain, boundaries and names.

The **Tool Bar** includes many useful tools, such as a **Ruler** for measurements, **Sun** to adjust the direction of sunlight, or creating features as a **Placemark**, **Polygon** or **Path**. Placing the mouse cursor over a tool reveals its purpose.

The **Status Bar** provides the date of the image, the Latitude/Longitude coordinates, and the ground and viewer elevation.

### Navigation Tools for Earth or Map View.



**Look Around.** This moves the map or view around the viewer. Clicking the left and right arrows rotates the view; the up and down arrows change the tilt of the view. Click and hold on the N to move it around to set the direction of north.

**Move Around.** This moves the viewer around in the map.

**Pegman.** This changes the screen to Street View (and Terrain View). Click and drag Pegman onto the map and the screen changes to Terrain View (make sure that Terrain is checked in the Layers panel). When Pegman is placed on a blue road, the screen changes to Street View.

**Zoom.** Moves the view closer or further away.

### Navigation Tools for Ground View.



**Ground View.** Allows you to select Pegman's Street View (if available) or Terrain View, and to exit back to Earth View.

**Look Around.** This moves the map or view around the viewer. Clicking the left and right arrows rotates the view; the up and down arrows change the tilt of the view. Click and hold on the N to move it around to set the direction of north.

**Move Around.** This moves the viewer around in the map.

**Zoom.** Moves the view closer or further away.