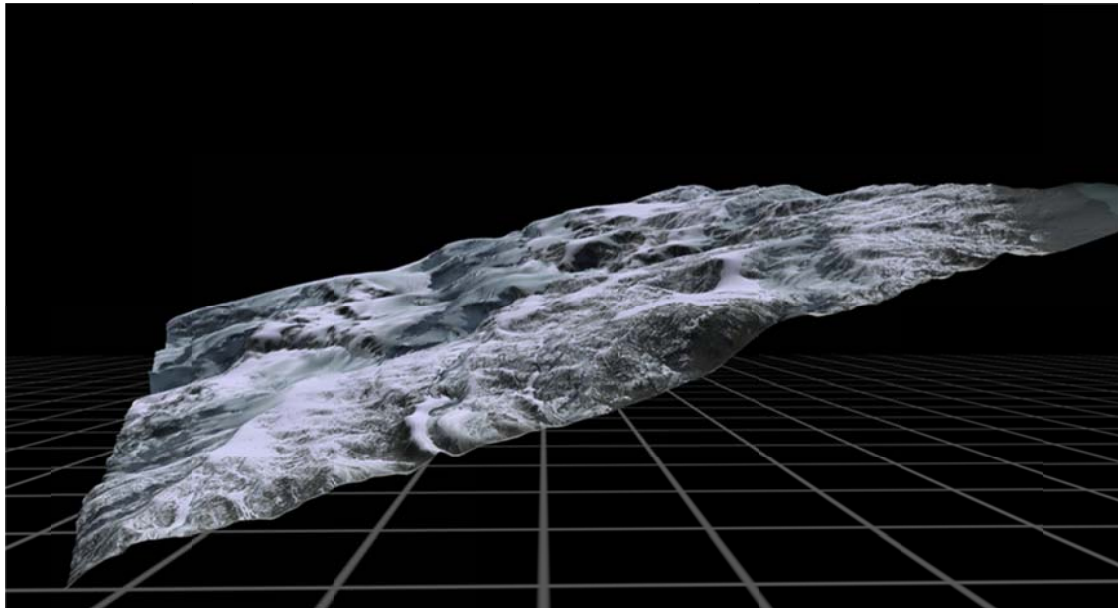




# User Manual

## ViMINE – Mining Method Selection



<b>Module Version:</b>	1.0
<b>Development Team:</b>	<b>UNSW:</b> Serkan Saydam, Rudra Mitra, <b>Vantage Interactive:</b> Darren Lee, James O'Rourke, Felix Yakub, Kei Onishi
<b>Special Thanks</b>	MTEC and University of British Columbia
<b>Compatible Platforms:</b>	Web
<b>Minimum PC Specification:</b>	Windows XP (with Service Pack 2) CPU: Pentium 4 2.4GHz Single Core processor System RAM: 1GB Video Card: Direct X 9.0c compliant video card with 128MB RAM Sound Card: 100% direct X 9.0c compatible sound card

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## 1. Module Overview

The ViMINE Module 1 scenario activity is on mining methods selection for both 1<sup>st</sup> and 3<sup>rd</sup> Year students. Currently the students learn how to select mining methods through several separate activities, without the benefit of an integrated simulation. At the end of the course, the students are assessed in the form of a written report and/or presentation and in a final exam, in which they are expected to demonstrate an integrated understanding of the selection process and its potential outcomes. The ViMINE environment would support an activity in which students:

- Familiarise themselves with the general context of a project scenario;
- Interpret and use exploration data provided;
- Use ViMINE Module 1
  - To locate the ore deposit using Google maps;
  - Visualise the ore body in 3D using a CAD package;
  - Estimate the volume and tonnage of the mineral resource;
  - Review different mining methods using a 3D VR demonstrations via ViMINE;
- Follow recommended mining method selection processes, using Excel tools;
- Choose the best possible methods;
- Use the visualiser function in ViMINE to see how each of these methods would work with the ore deposit;
- Take into account other economic and environmental factors identified in the project scenario;
- Use ViMINE to present and justify a final team decision on the mining method.

## 2. Educational Outcomes

In scenario-based learning activities run through the ViMINE Module 1, students are able to access information from multiple simulations and to make decisions. The project will develop some initial ViMINE learning activities and evaluate their effectiveness for building systems thinking skills.

ViMINE activities will give students authentic experience in working with industry software packages, while also contextualizing the learning in terms of the broader and longer-term impact of technical decisions.

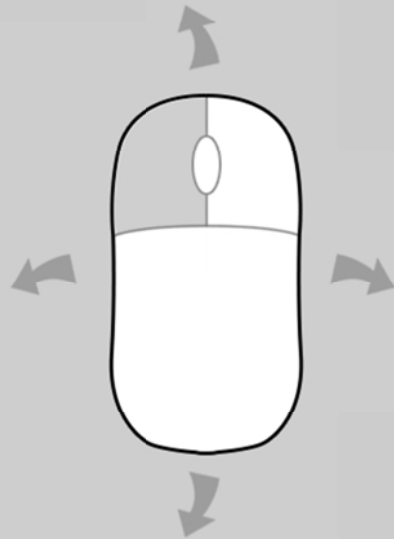
### **The Module 1 aims are to:**

1. Give 1<sup>st</sup> and 3<sup>rd</sup> year mining engineering students access to authentic experiential learning in which they are able to place technical decision-making in a socio-economic and environmental context.
2. Establish effective designs for learning activities in mining engineering using the ViMINE environment.
3. To provide a framework to allow students to build a simulation model of an authentic mining operation;
4. To allow students to learn from mistakes in virtual environments without causing any loss of life and damage to property;
5. To engage students as more active and powerful participants in their learning process;
6. To establish a range of collaborative learning resources and activities that can be used across a number of mining engineering courses and programs.

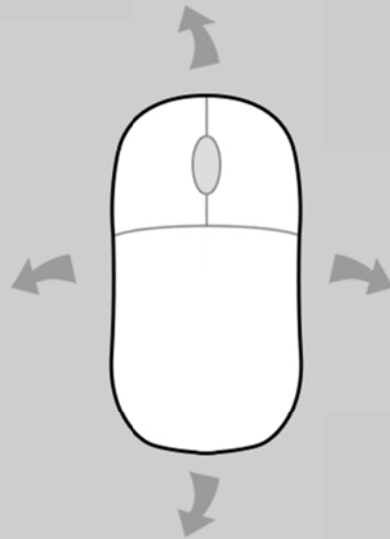
#

## PC/MAC CONTROLS

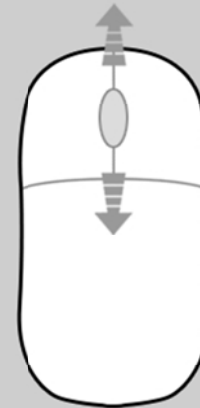
## ViMINE - Mining Method Selection



Left mouse click + drag  
to rotate camera



Middle mouse click + drag  
to pan camera



Middle mouse scroll  
to zoom in/out

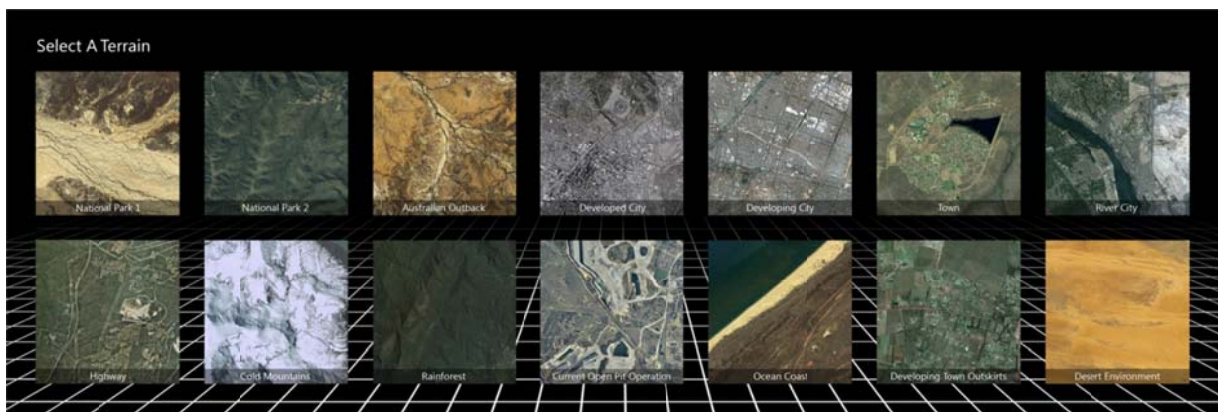
## 4. Module Walkthrough

### 4.1 Introduction to Mining Systems

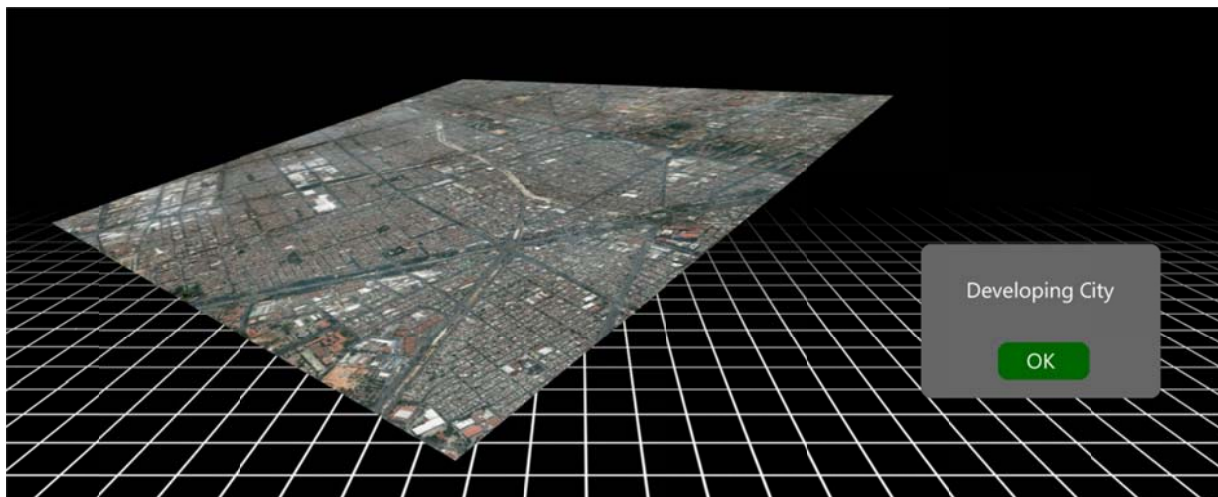
#### 4.1.1 Terrain Selection

The Terrain Selection section consists of fourteen pre-defined environments.

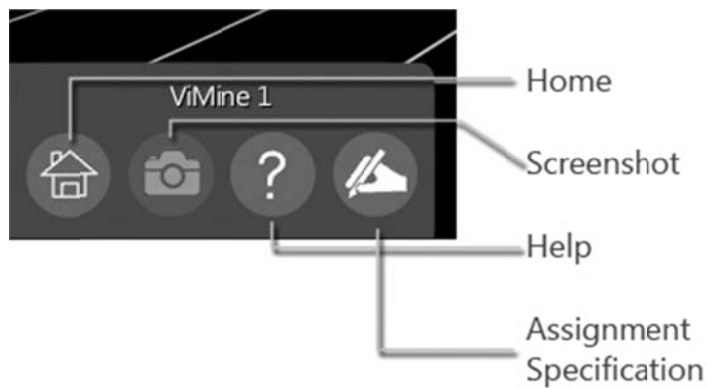
1. Click on the thumbnail images to preview a terrain.






2. The selected terrain will appear on the right. Click "OK" to proceed.







The Menu panel is available throughout various stages of the module.

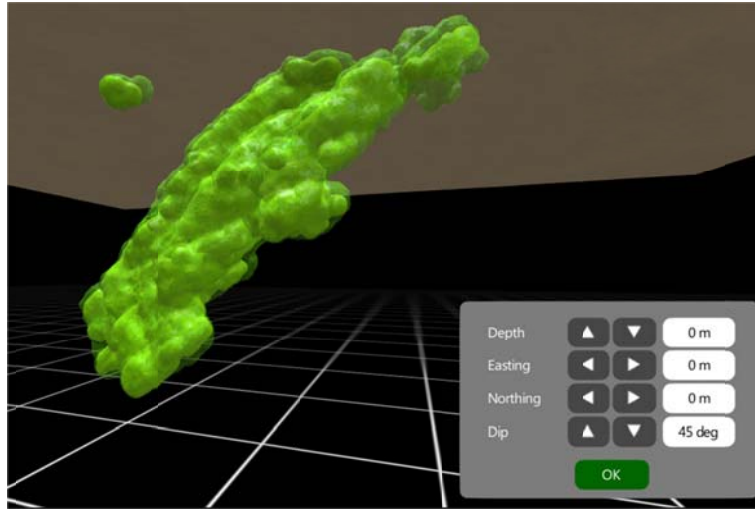


Using the mouse:

- Click the “Home” button  to return to the main menu.
- Click the “Help” button  to view the User Controls Help.
- Click the “Screenshot” button  to capture a screenshot of the current terrain and ore body. The “Screenshot” button is only active in the Videos and Screenshot section.

#### 4.1.2 Ore Body Positioning

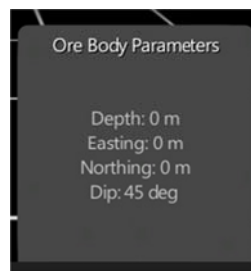
1. On the Select Ore Body Position panel, use the arrow buttons , ,  and  to move the position of the ore body.



2. Use the mouse to orbit your view around the ore body.
3. Use the mouse scroll wheel to zoom in and out of the ore body.
4. Once the ore body position has been decided, click “OK” to continue.

#### 4.1.3 Ore Body Information

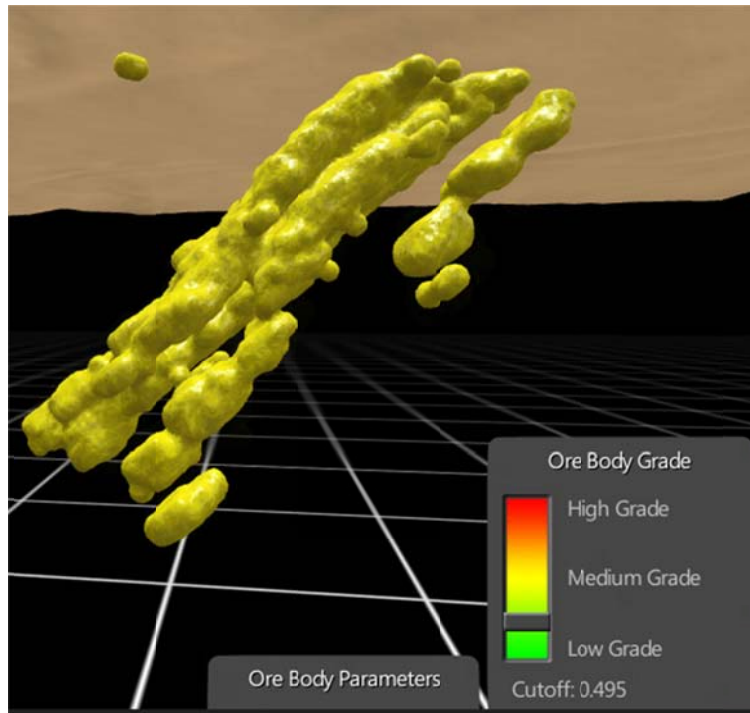
The previously entered ore body information can be viewed by clicking the “Ore Body Parameters” tab along the bottom of the window.





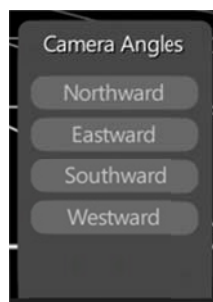
#### 4.1.4 Ore Body Grade

Clicking the “Ore Body Grade” tab will bring up a slider which will allow you to select the visible grade of the ore body.




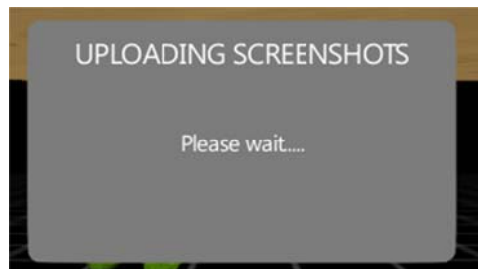
#### 4.1.5 Camera Angles

Clicking on the “Camera Angles” tab will open a list of preset camera angles. Click on these to automatically move the camera to these viewpoints.

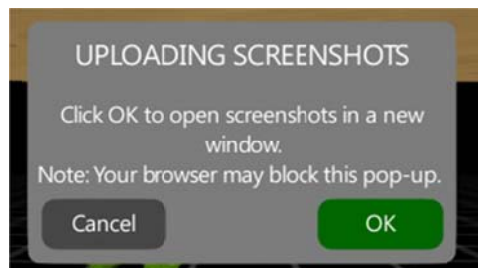


#### 4.1.6 Screenshots

To take screenshots of the ore body, click the “Screenshot” button  in the Menu panel. While the screenshots are being uploaded, the following dialog box will be presented:



Once the screenshots have been uploaded, click “OK” to open them in a new window, or “Cancel” to return to the module. Please check your browser settings to make sure that popups from the ViMine web site are permitted.

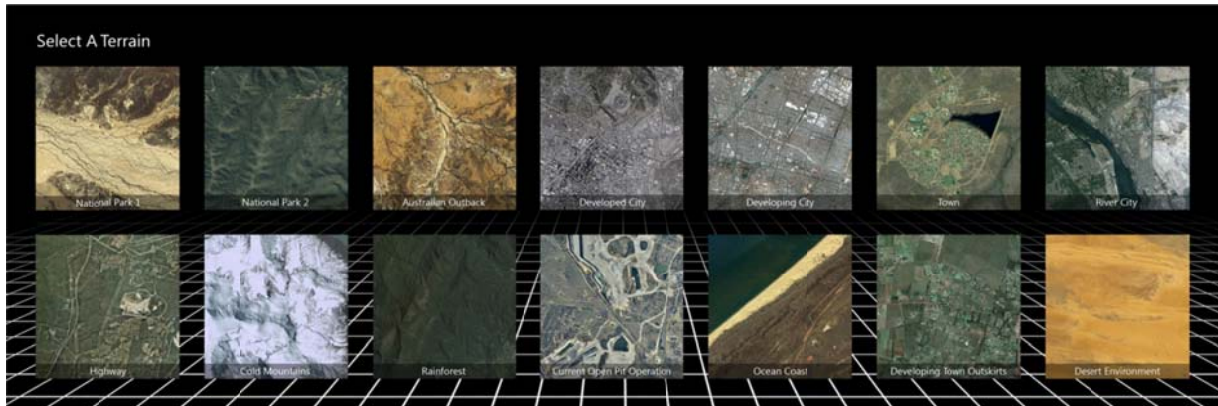


## 4.2 Mining Method Selection

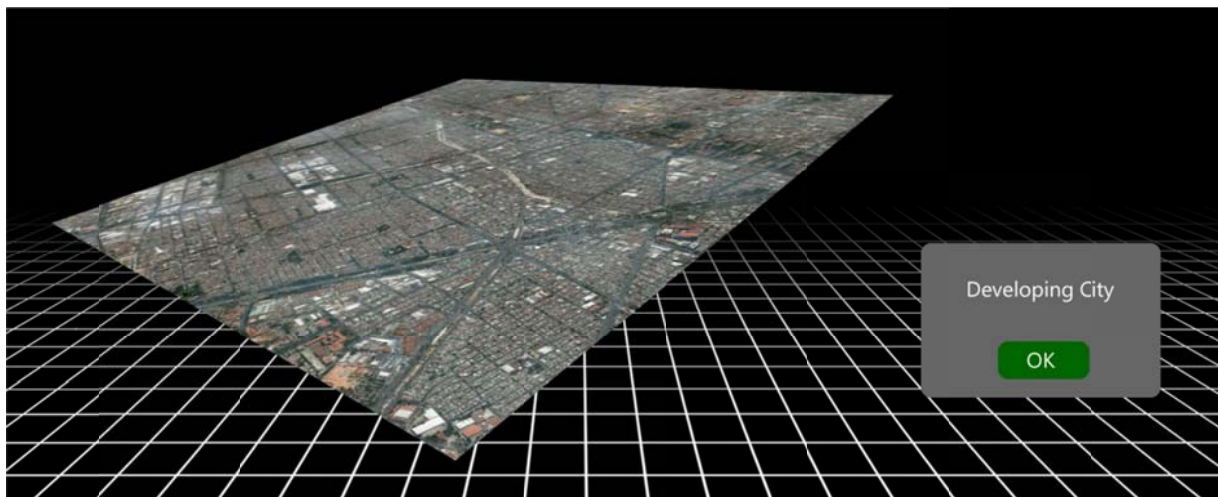
### 4.2.1 Terrain Selection

The Terrain Selection section consists of fourteen pre-defined environments.

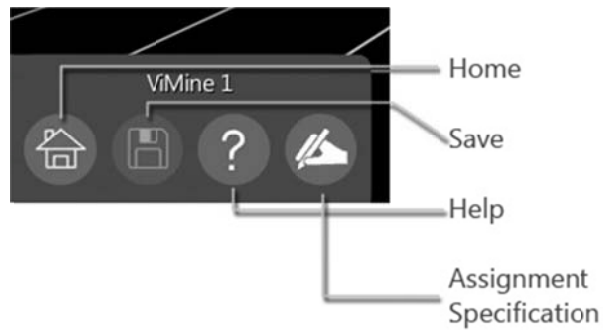
1. Click on the thumbnail images to preview a terrain.






2. The selected terrain will appear on the right. Click "OK" to proceed.







The Menu panel is available throughout various stages of the module.

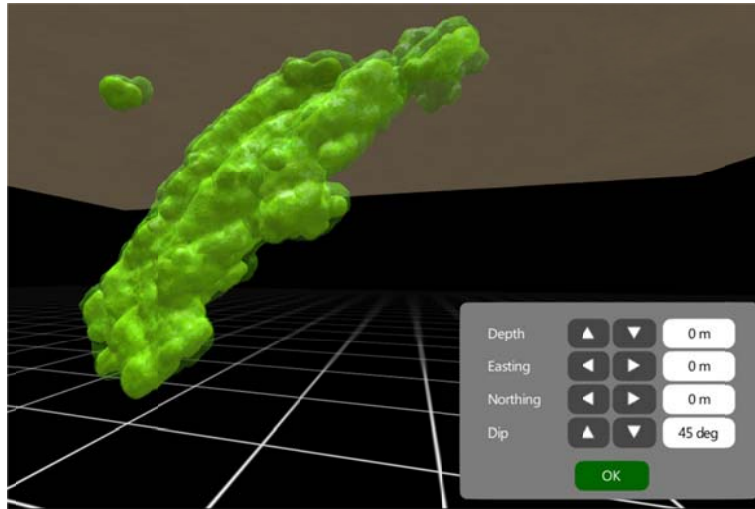


Using the mouse:

- Click the “Home” button  to return to the main menu.
- Click the “Help” button  to view the User Controls Help.
- Click the “Save” button  to save your session (The “Save” button is only active in the Nicholas Algorithm section)

## 4.2.2 Ore Body Positioning

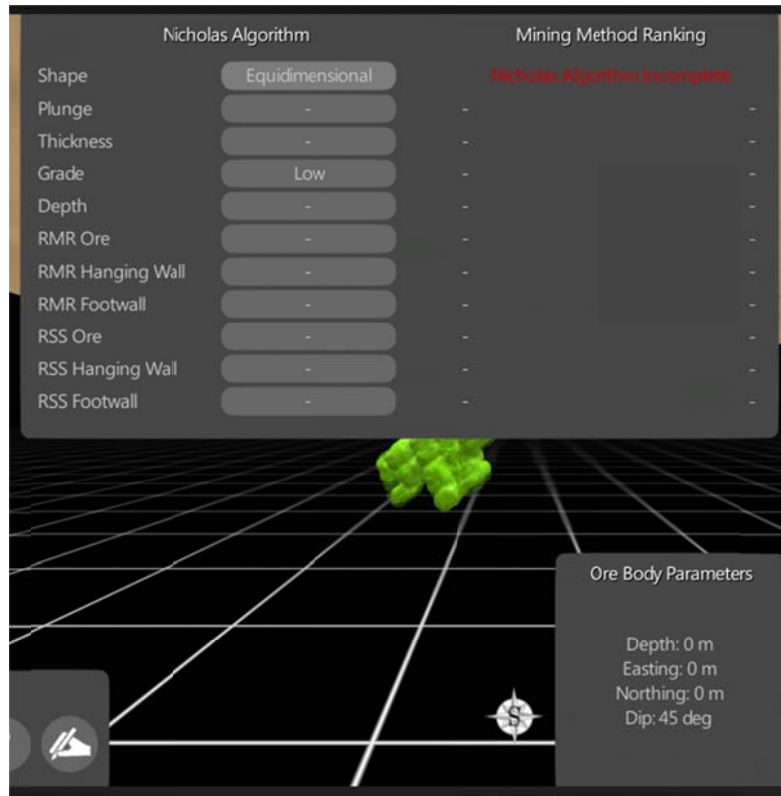
1. On the Select Ore Body Position panel, use the arrow buttons , ,  and  to move the position of the ore body.



2. Use the mouse to orbit your view around the ore body.
3. Use the mouse scroll wheel to zoom in and out of the ore body.
4. Once the ore body position has been decided, click "OK" to continue.

### 4.2.3 Nicholas Algorithm

1. On the Nicholas Algorithm panel, enter all the required fields. The previously entered ore body position data can be found by clicking on the “Ore Body Parameters” tab.




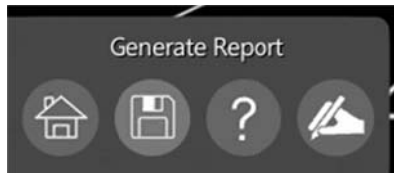
2. Click the “Nicholas Algorithm” tab to show and hide the Nicholas Algorithm panel.

3. Based on the information entered into the Nicholas Algorithm panel, the Mine Method Ranking panel will display the mine methods in order of preference. All fields in the Nicholas Algorithm panel must be filled for the calculations to take place.

Nicholas Algorithm		Mining Method Ranking	
Shape	Equidimensional		
Plunge	Moderate	Open Pit	40
Thickness	Thick	Sublevel Stoping	38
Grade	Low	Sublevel Caving	25
Depth	<100m	Cut and Fill	24
RMR Ore	Strong	Block Caving	19
RMR Hanging Wall	Very Strong	Top Slicing	18
RMR Footwall	Strong	Square Set	4
RSS Ore	Strong	Room and Pillar	-19
RSS Hanging Wall	Strong	Shrinkage Stoping	-22
RSS Footwall	Strong	Longwall	-84

## 4.2.4 Generate Report

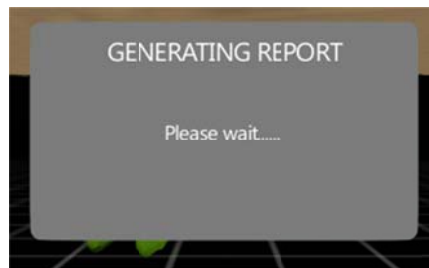
Click the “Save” button  on the Menu panel to save a report.



Data saved under a session:

- The terrain choice
- Inputs of the ore body position
- Inputs of the Nicholas Algorithm

While the report is being generated, the following dialog box will be presented:



Once the report have been uploaded, click “OK” to open it in a new window, or “Cancel” to return to the module. Please check your browser settings to make sure that popups from the ViMine web site are permitted.

