

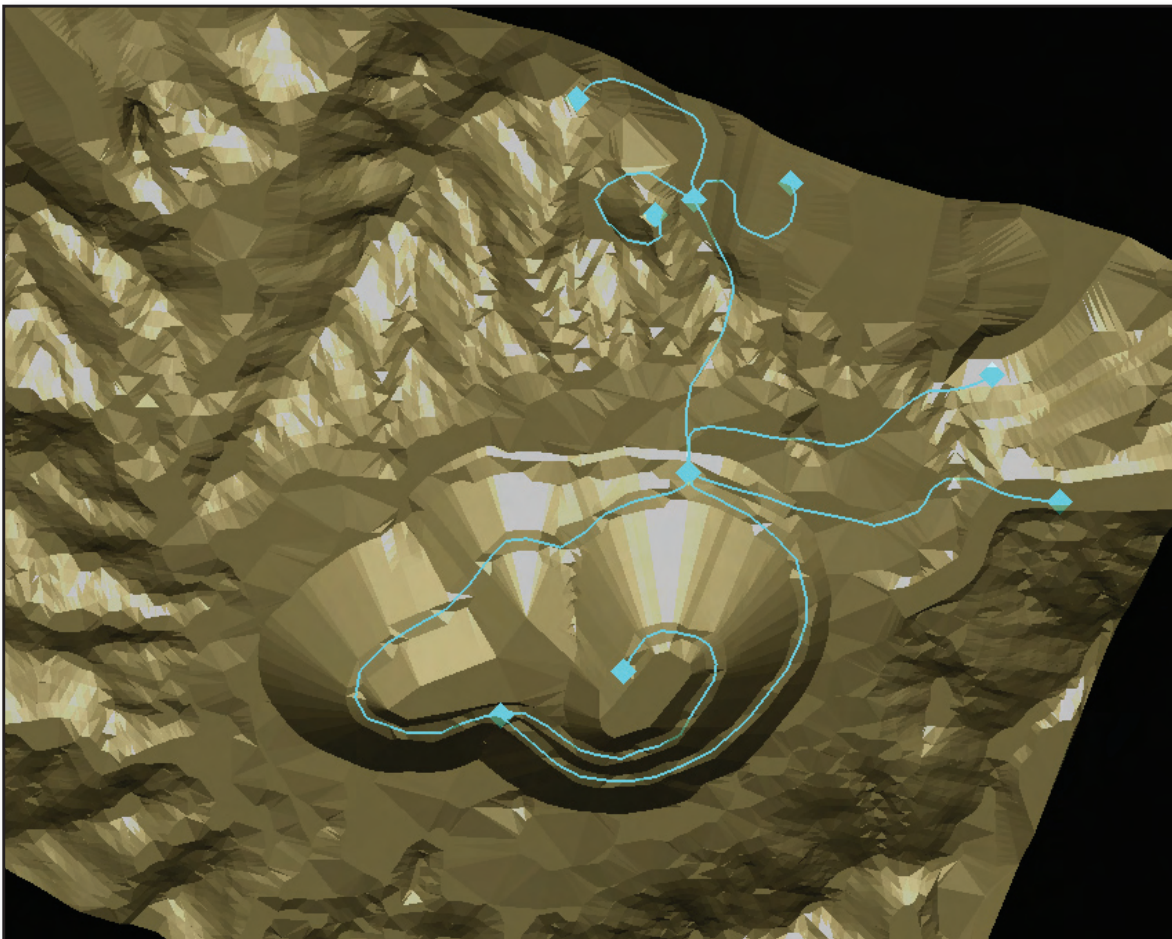
# MINE SIGHT® in the Foreground

Volume 24, Number 5, May 2008

## Current Affairs

# Introducing MineSight® Haulage

MineSight® Haulage is a new mine planning tool scheduled for release in MineSight® 3D (MS3D) v.4.10. MSHaulage is used to build road profiles and cycle time files. When used together with the MineSight® Interactive Planner (MSIP), it can create Material Routing reports and Equipment Requirement reports.



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## Using MSHaulage

### Preparation

Some preparation is required before you can use this tool. You should have already developed a mine plan, mining phases, a pit design, know what lift strategies you want to use, and have planned the location of stockpiles, dumps, and any other hauling destinations.

To begin using the Haulage tool, the following is required:

- An existing SQL Attributed Geometry (AGDM) database source. [*Note: MSHaulage does not support Microsoft® Access databases.*]
- A road network consisting of nodes and polylines. These geometry objects should already be digitized in MS3D and have attributed names that identify them, e.g., Dump, Stockpile, Road, etc.
- If you want to recreate a **Material Routing Report**, use cuts from an existing IP Plan or create cuts as you go. Both MSHaulage and MSIP can be used side-by-side.

### SQL Database

To aid in the first requirement of having an SQL database, the following files will be provided. The first two files are for new IP and Haulage Plans. For those with existing IP Plans, use the third choice on this list to prevent any loss of data.

1. A detached database that contains all of the tables necessary to run MSIP and MSHaulage. In this case, you simply attach this database and then run MS3D.
2. An SQL script to set up a new database from scratch that contains both the IP Plan tables as well as the Haulage Plan tables.
3. An SQL migration script to migrate your existing SQL database forward by adding the Haulage Plan tables.

### Road Network

A road network consists of interconnected polylines and node elements. Each polyline and each node has an attributed name to identify it.

For every road in the network, a node must exist at the start and end of the road polylines and every road is assigned a Destination Type:

Type
<Destination>
<Tie-Node>
<Destination>
<Source>
<Stockpile>

**Tie-Node(s):** Nodes where multiple roads in the network join.

**Destination:** The node at the end of the road, such as a dump.

**Source:** The node at the start of the road, such as a mining face.

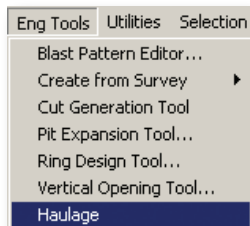
**Stockpile:** Both a starting point and an ending of a road. In the case of a stockpile, material is added to it from a source, i.e., a mining face, and at the same time, material is being removed from it to another destination, i.e., going to a crusher.

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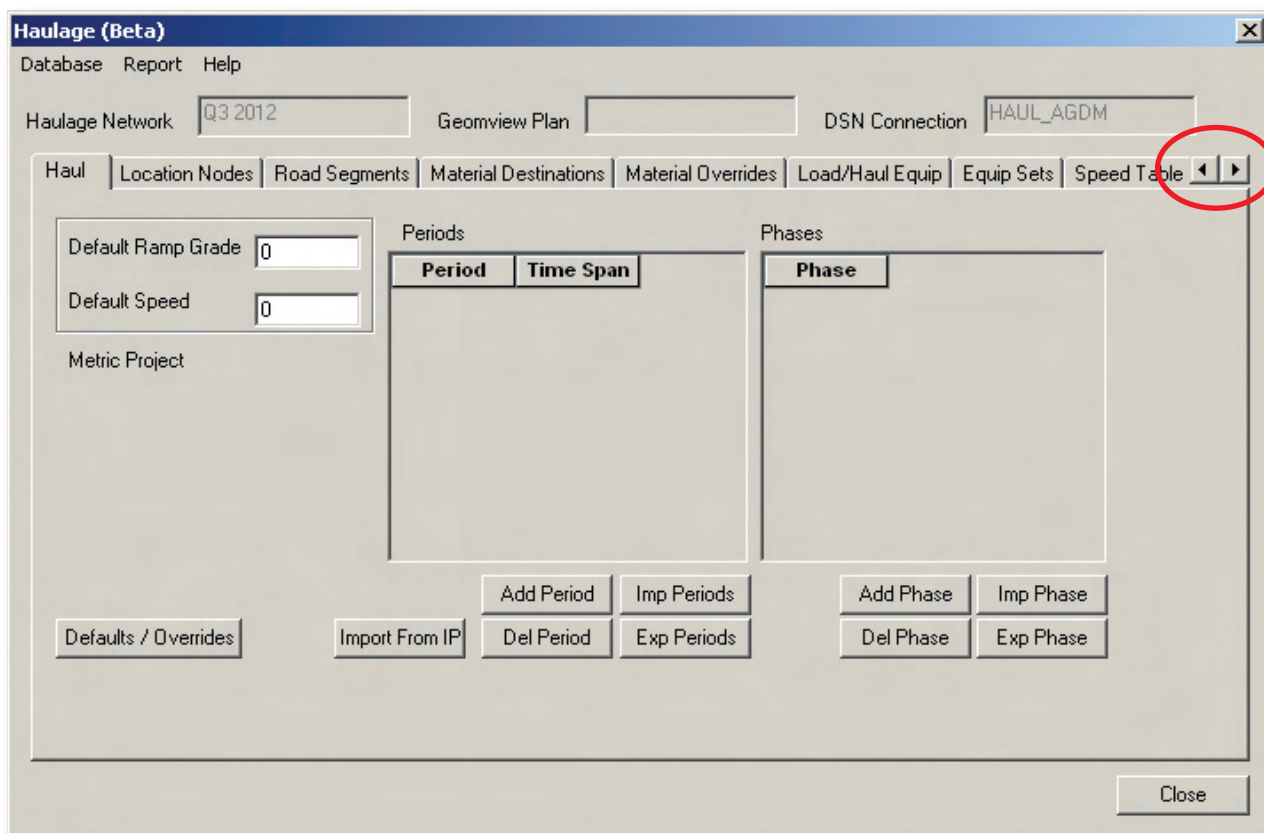
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## The Haulage Tool in MS3D

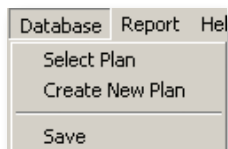
**Haulage** is accessed from the **Engineering Tools** menu.



Once the ODBC connection has been made to the existing SQL AGDM database, the Haulage dialog is displayed. The Haulage dialog contains 10 tab page dialogs (in order to access them all, use the arrows circled below to scroll left and right).



Creating a new Haulage Plan or opening an existing plan is done from the **Database** menu along the top of the tool's dialog.



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To use an IP Plan together with the Haulage tool, the IP Plan must be imported into the current Haulage Plan. Click on the **Import from IP** button on the **Haul** tab dialog, and then select an existing IP Plan.



### Summary of the 10 MSHaulage tab page dialogs:

**Haul:** Input mining periods and phases, and define several defaults.

**Location Nodes:** Contains the definitions and details about the location nodes. Points (geometry objects) are selected from the MS3D viewer and are stored as geometry view objects in the Haulage tables in the AGDM.

**Road Segments:** Contain the definitions and details about the road segments. Polylines (geometry objects) are selected from the MS3D viewer and are stored as geometry objects in the Haulage tables in the AGDM.

**Material Destinations:** Only used if you are using the Haulage tool to do **Material Routing**. Information on this dialog is imported from an existing IP Plan.

**Material Overrides:** Specifies the use of certain equipment or go to a specific destination for an individual destination type.

**Load/Haul Equip:** Where equipment is defined by availability, efficiency, and capacity.

**Equip Sets:** Follows input from **Load/Haul Equip**, and is where wait times, spotting times, or delays are input based on truck type and matching shovel type. No mixed fleets are allowed.

**Speed Table:** Where speeds and fuel economy or burn rates for the truck fleet previously defined on the **Load/Haul Equip** dialog are defined.

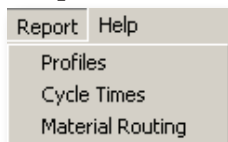
**Network Editor:** Use this dialog to change the definitions of the various elements of the road network (roads and nodes), lift handling, speeds, and rolling resistance (used in cycle time calculations).

**Report Editor:** Create custom **Material Routing** reports or **Equipment Requirement** reports. To use this option, you must have reserves that came from elsewhere, such as an IP Plan (which does not have to be open). **Equipment Requirement** reports are a list of what resources it took to move the blasted rock to a particular destination.

If you simply want to create **Road Profiles** or **Cycle Time Files**, then it is not necessary to input information on all 10 dialogs. You would only need to fill out information relating to nodes, roads, and equipment, and that is done on the **Haul**, **Location Nodes**, **Road Segments**, **Load/Haul Equip**, **Equip Sets**, **Speed Table**, and **Network Editor** tab dialogs. However, if you want to create **Material Routing** reports, then information must be input on all of the tab dialogs.

### Output

Output from MSHaulage is generated from the **Report** menu along the top of the tool's dialog.



**Profiles:** Saves the road profiles to **ASCII CSV** files for every polyline from every source to

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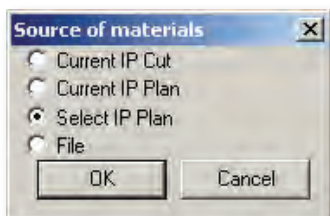
every destination, and vice versa, in a selected directory. These files contain the node coordinates for every point along the polyline (Easting, Northing, and elevation). The values are not rounded, and are output in full precision which cannot be controlled by the user.

	A	B	C
1	3496.330811	2722.585449	6064.4375
2	3467.618408	2710.362915	6038.738403
3	3442.286621	2707.078979	6019.432739
4	3411.888428	2705	6003.097168
5	3371.357422	2692.321167	5997.156982
6	3340.959229	2667.615112	5979.336426
7	3306.760986	2645	5939.240234
8	3292.828613	2645	5902.114014
9	3268.763428	2644.822937	5853.107422
10	3223.166016	2645	5817.466309
11	3178.835205	2650.105469	5805.585938
12	3137.037598	2660	5796.675659

**Cycle Times:** This option is used to export an **ASCII** text file in a specific format ready for use in MineSight® Strategic Planner (MSSP), such as the example shown below. The headers in this example are for illustrative purposes only.

SOURCE	DESTINATION	Cycle Time	Burn Rate
SOURCE2375	2375.0 CRUSHER Lift-1 none	39.823	10.000
SOURCE2375	2375.0 DUMP Lift-1 none	43.417	10.000
SOURCE2375	2375.0 DUMP Lift-2 none	43.417	10.000
SOURCE2375	2375.0 DUMP Lift-3 none	43.417	10.000
SOURCE2375	2375.0 Node-0 Lift-1 none	44.538	10.000
SOURCE2375	2375.0 Node-0 Lift-2 none	44.538	10.000
SOURCE2375	2375.0 Node-0 Lift-3 none	44.538	10.000
SOURCE2375	2375.0 Node-1 Lift-1 none	44.829	10.000
SOURCE2375	2375.0 Node-1 Lift-2 none	44.829	10.000
SOURCE2375	2375.0 Node-1 Lift-3 none	44.829	10.000
SOURCE2375	2375.0 STOCKPILE Lift-1 none	40.670	10.000

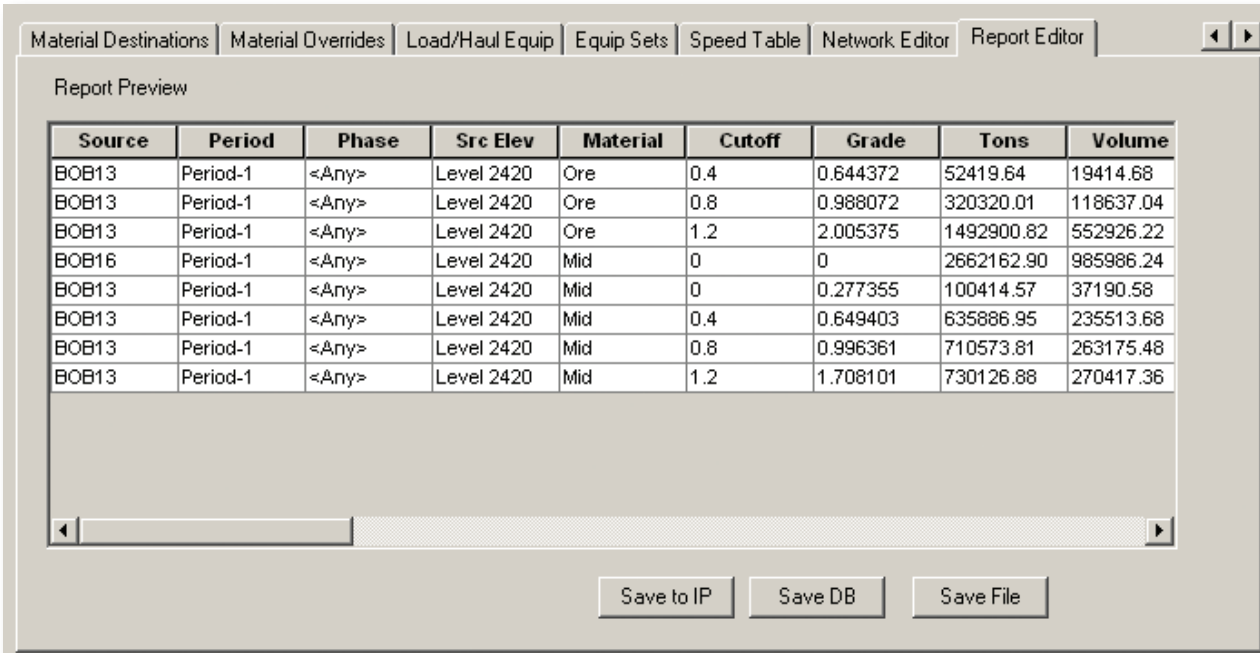
**Material Routing:** To use this option, you must choose the currently open IP cut or Plan, an IP Plan that is not currently open, or select a reserves summary file (such as that generated from **PITRES.DAT**). You should then go to the **Report Editor** tab dialog.



A temporary report will be created and the information from this report is used to populate the **Report Editor** tab dialog.

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At the bottom of the **Report Editor** dialog, use one of the **Save** buttons:

- Use **Save to IP** to save the **Material Routing** back to the IP Plan’s haulage field in the AGDM.
- Use **Save DB** to save the results to the database but to a separate table on-the-fly.
- Use **Save File** to save the results to an **ASCII** file in **.CSV** format.

MineSight® Haulage is a powerful tool. Look for it in MineSight® 3-D v.4.10. If you have any questions, concerns, or would like further information about this new tool, please contact Mintec Technical Support.

## TIP OF THE MONTH

Several “out of the box” scripts were included on the 2007 Update CD. They are part of the standard MineSight® distribution and can be found in the `%medexe%\scripts` directory.

For example:

- `contoursFromDir.pyc` will create contours for all shells in a directory or object.
- `createPartials.pyc` will create partials files for all shells in a directory or object.
- `poly2dRpt.pyc` and `shellRpt.pyc` report on all 2D polylines and shell elements respectively.
- `minesight-info.pyc` reports information useful for diagnosing MineSight® related environmental and registry settings issues.

The `contoursFromDir.pyc` and `createPartials.pyc` can be run from a multirun making it easier to set contours and partials for multiple objects on a regular basis.

Most of these scripts will run from within MineSight® or from the command line and several of them run recursively through your directory structure.

More information about the standard scripts can be found in the `SCRIPTS.CHM` helpdoc file.