

HSC Chemistry® 6.0 Software

HSC Map - Stock and Mixture Control Module Manual

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The screenshot displays the HSC Map software interface. The main window shows a map of an industrial site with various buildings and a river. The title bar reads "HSC Map - C:\HSC6\Map\Stocks\Demo Stock\ - [Map]". The menu bar includes "File", "View", "Tools", "Window", and "Help". The mode is set to "Näytä kaikki varastopaikat" (Show all stock locations) and the map file is "Pori tehdasalue.jpg". The map shows several yellow circles representing stock locations and a red line indicating a path or boundary. The text "Outokumpu Research Oy" is visible on the map.

On the right side, there is a "Material" panel with the following data:

Material		
General		
Add...	Transport...	Reset...
Place Name	13	
Material	Concentrate S 2003	
Amount	5000	Tons

Below the material panel is an "Analysis" table:

Analysis		
Change...	Save...	Filters...
Sample Date	31.12.2003 0:00	dd.mm.yy
Analysis Name	Concentrate S 2003	
Fuel Value	-1955.76	kWh/t
O2 Demand	371.46	Nm3/t
Ag	0.05	wt-%
Al		wt-%
As	0.19	wt-%
Au	0.00	wt-%
Bi	0.02	wt-%
C	9.70	wt-%
Ca	1.24	wt-%
Cd	0.01	wt-%
Cl	0.01	wt-%
Cu	10.08	wt-%
F	0.01	wt-%
Hg	0.00	wt-%
Mg	0.11	wt-%
Mn		wt-%
Ni	0.03	wt-%
Pb	2.41	wt-%
Pt		wt-%
S	25.50	wt-%
Sb	0.12	wt-%
Se		wt-%
Si	2.62	wt-%

At the bottom of the map window, the coordinates are displayed: "Finland 21° - 1500km: N 61.46220° - E021.86798°" and "WGS-84 00.00000°". A "Zoom" button is also visible.

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Project Number
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Syöttöseos, varastovalvonta, simulointi

Abstract

HSC Map is location (GPS) based stock control software. HSC Map is designed for feed mixture calculation and raw material stock control. The basic idea is that the user may easily collect the raw materials from the stock and calculate a single or multi mixture composition, in order, for example, to obtain the proper copper and silica content and calorific value in the feed mixture. The user may also test the calculated feed mixtures using the HSC Sim process calculator before starting to use the new mixture.

The material location data may be used in the HSC Map software, because most concentrates, fluxes and scrap materials look the same and the easiest way to identify them is the map location data. Valid location data decreases material searching time and also the number of various mistakes and errors when raw materials are transported in the stock field.

Precise feed mixture calculations are useless if the bucket charger has picked one wrong raw material for the mixture. The GPS navigators are coming more common in trucks, bucket charges, taxi, etc. this makes possible the utilization of location data also in the stock field.

The place location data is not always needed. HSC Map may also be used as a general material mixture calculator based on the material analysis database. The user may select the materials either from the stock or from the analysis database.

HSC Map may be used for feed mixture calculations but it may also be used to create a worldwide register of raw materials, products, waste materials or chemicals. Map module helps, for example, to find the locations which contain the given material property such as copper, gold, arsenic, fuel value, etc.

HSC Map contains six modules. The **Stock** module shows the stock places and the materials on the list. The **Map** module shows the stock places and properties on the map. The **Diagram** module may be used to draw diagrams from the history file. The **Mixture** module is used to calculate mixtures. The **Bed** module is a custom made version of the Mixture module for Bed mixture calculations. The **Help** module shows the HSC Help interface. This manual is a part of the HSC Chemistry and Sim manuals and therefore the chapter numbers start from 54.

HSC Map stock database files contain **confidential information** such as raw material names, amounts and analyses. Therefore each plant needs a different HSC Map installation CD and HSC Map license. The software is the same but the material databases are different. The geographical maps cannot usually be regarded as confidential information because anybody may buy these from National Land Survey offices. Although HSC Chemistry is public software, HSC Map and Sim extensions are meant for internal use.

Important Note:

Only an "empty frame" version of the Map module is delivered with the HSC Chemistry software. Usually this frame version needs some customizing and tuning because the stocks and practices are different in each plant. Please take contact to Outotec Research Oy if you are interested in custom made Map applications.

54. Map - Mixture and Stock Control

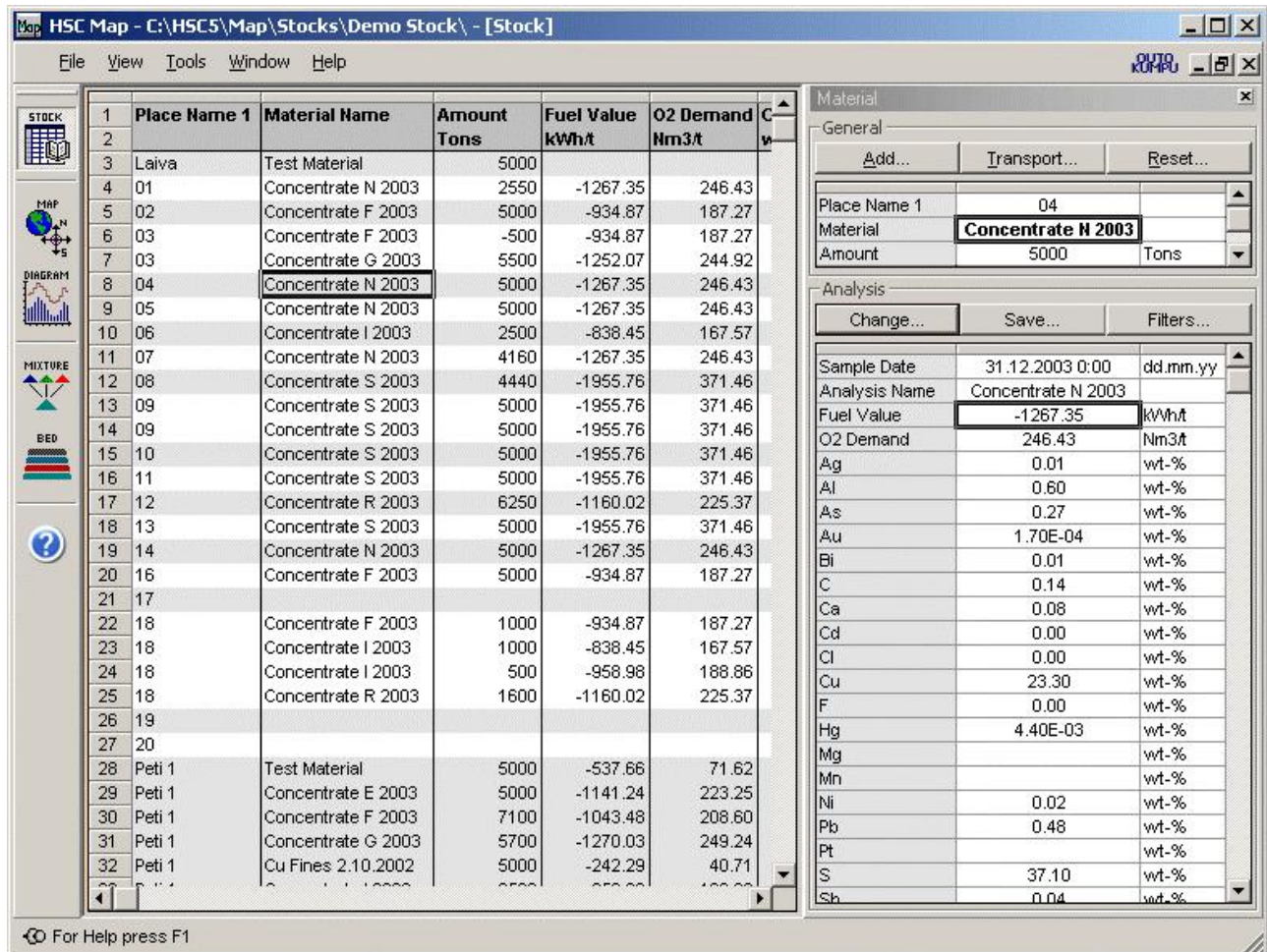


Fig 1. HSC Map user interface.

HSC Map is made for feed mixture calculation and raw material stock control. The basic idea is that the user may collect the raw materials from the stock and calculate a single or multi mixture composition and test the calculated feed mixtures using the HSC Sim process calculator. The map location data decreases material searching time and the number of mistakes and errors.

The HSC Map user may collect the raw materials from the stock list, map or from the analysis database. If he/she decides to use the selected mixture then the HSC Map automatically decreases the mixture materials from the stock and saves a change record in the history database for this material change event.

HSC Map contains six modules which may be selected from the icons at the left side of the screen. The **Stock** module shows the stock places and the materials on the list. The **Map** module shows the stock places on the map. The **Diagram** module may be used to draw diagrams from the history file. The **Mixture** module is used to calculate mixtures. The **Bed** module is a custom made version of the Mixture module for Bed mixture calculations. The **Help** module shows the Help interface, which is common for HSC, Sim and Map.

HSC Map may be applied for many different types of raw material stocks and mixture calculations. The Stock, Analysis and History databases and some maps may contain confidential business information, therefore these files are specific for each plant.

54.1 Terminology and Specifications

We have tried to use the clearest keywords in HSC Map. This chapter gives a short summary and specifications of this terminology.

Stock	The user may create any number of stocks. Each stock contains Stock, Analysis and History databases. The Stock database consists of Place and Material Tables. The path to stock databases is usually: C:\HSC6\Map\Stock.	
Place	The place is the base unit of the stock. The user may specify up to 65533 places into one stock. The place contains properties such as Name, Size, Type, Location, Address, etc. The place could be a warehouse, silo, rack, stockpile, tank, freezer, etc. This data is saved into the Stock file. The place name is used to identify the place, however, the software identifies the places internally using a Place Identification Number.	
Material	Nearly any type of material, item and goods may be saved in the stock places. The material name is used to identify the material.	
Properties	Materials always have 123 fixed properties, such as amount, temperature, element analysis, etc. In addition each material may have 133 individual optional custom properties which the user may specify.	
Analysis	All material records have specific analysis fields, which makes it possible to save the changes in material analysis in the History file. However, a separate Analysis database is also available. This may be used to pick an analysis for the raw materials. The analysis name and sample date are used to identify the analysis.	
History	HSC Map saves all material changes (amount and analysis) in the History file. This history file makes it possible to draw diagrams.	
Diagrams	All diagrams are based on the History file, and usually the time scale is used on the x-axis.	
Databases	Stock, Analysis and History databases are saved in unlocked Excel format. However, in future they may also be hidden if this is necessary.	
Maps	HSC Map shows the stock places and material on the map. Nearly any type of map may be used, for example, the ground plan of the stock warehouse or stockyard as well as geographical maps. Maps with a rectangular coordinate system can be calibrated to show the location coordinates in normal GPS format. You must always take into account the Copyright issues when you are using the maps.	
Datum	The map datum specifies the Earth's shape, one fixed point and the scale. Ie. datum specifies which coordinate system is used for the given map. HSC Map always saves the place location coordinates but also the datum information. This makes it possible to show the places in the correct locations on any calibrated map.	
Folders	C:\HSC6\Map\Maps	Map files (JPG, EMF, etc.)
	C:\HSC6\Map\Mixtures	Mixture and bed files
	C:\HSC6\Map\Photos	Photos of materials (JPG, EMF, etc.)
	C:\HSC6\Map\Stocks	Stock folders
	C:\HSC6\Map\Stocks\Harjavalta	Harjavalta stock files (Analysis, Stock, History)
	etc.	

54.2 HSC Map User Interface

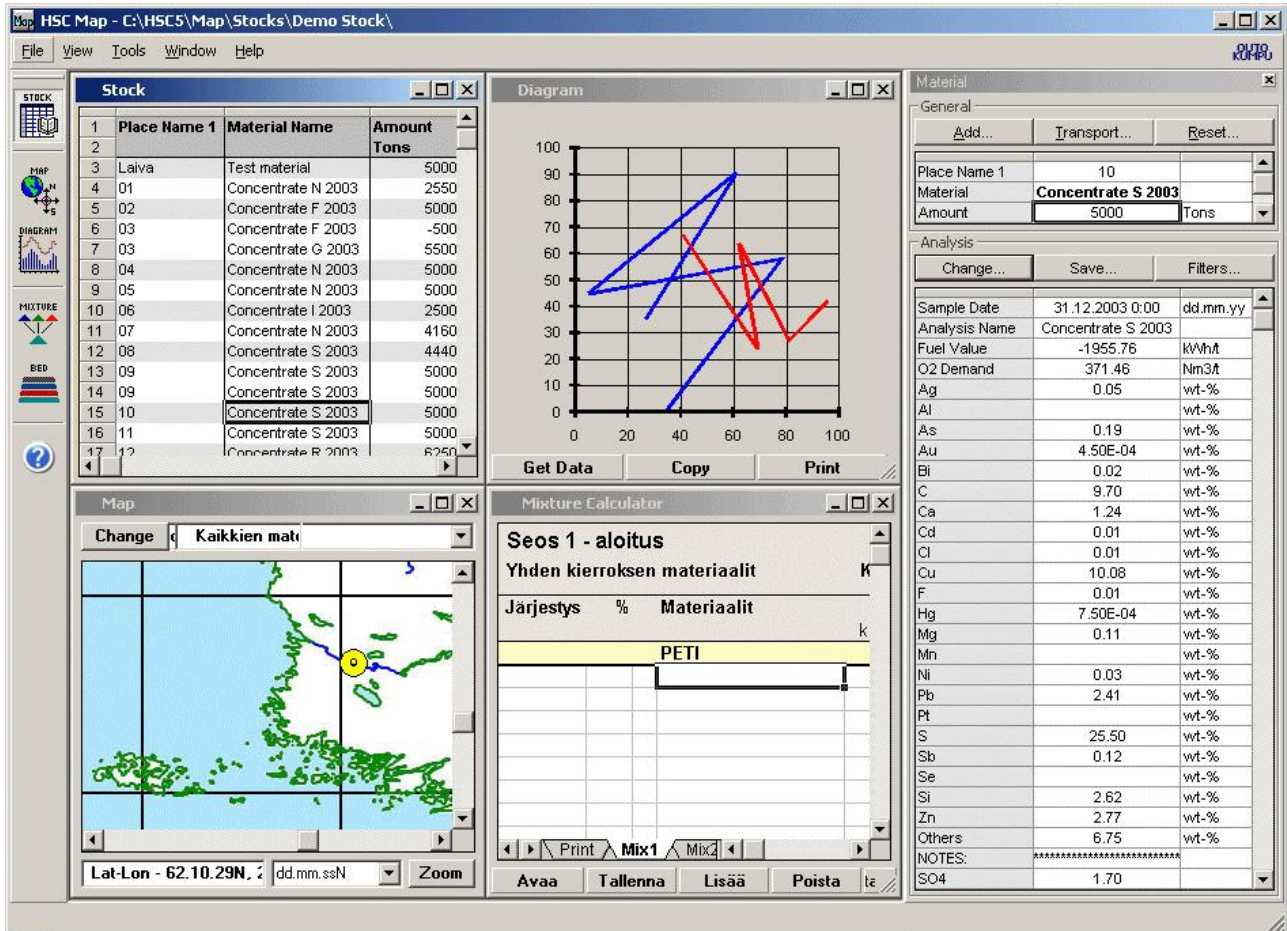


Fig 2. HSC Map user interface when all modules are visible.

The HSC Map user may select the visible modules on the screen using “View, Toolbars,...” and “Window, ...” menu selections, in the same way as in MS Excel. For example, only the Stock module and Material Toolbar are visible in Fig. 1. whereas all four modules and Material Toolbar are visible in Fig. 2.

The user may resize, hide and edit module views quite freely. Note that the Material Toolbar is automatically linked with the Stock, Map and Mixture modules.

HSC Map automatically saves user-defined settings, such as the last selected stock and map names in the **HSC_Map1.INI** and **HSC_Map2.INI** files. HSC Map reads these files the next time you start the HSC Map. This makes HSC Map remember the last user settings. If you want to reset all the settings to the default settings, please delete these files from your \HSC6\folder.

You may **scroll** the map by holding down the left or right mouse button in the same way as in Adobe Reader. You may **zoom** using the Zoom button, but also with the mouse wheel and by holding down “Alt Gr”, the mouse pointer specifies the zoom centre. The mouse wheel may also be used to scroll up and down the map and also left and right by holding down “Shift” key.

The language (English, Swedish, Finnish, etc.) selection is not ready in the first HSC Map version 1.0.

54.3 HSC Map User Settings

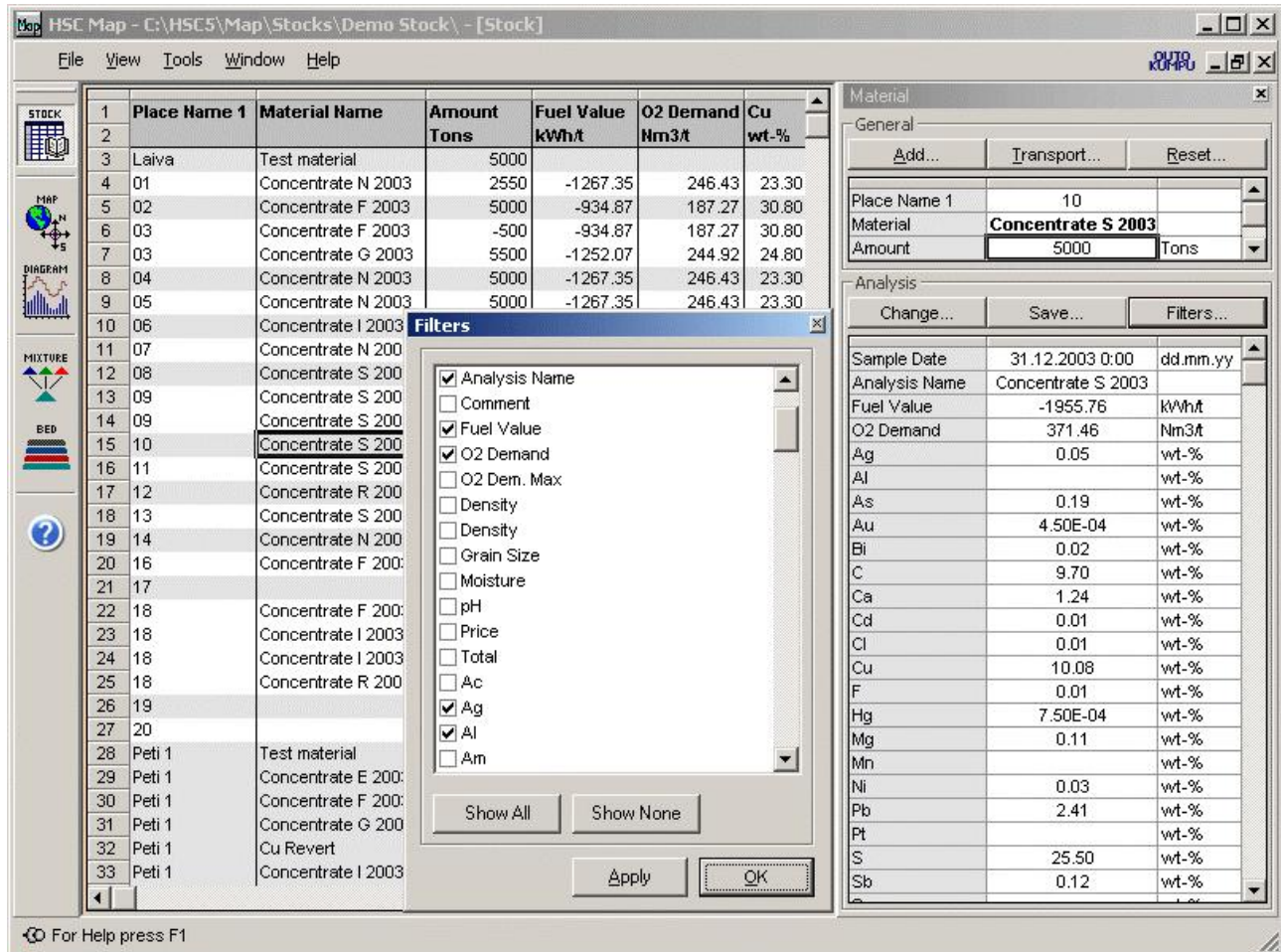


Fig 3. Material Toolbar user settings may be changed using Filters Dialog.

The Material Toolbar shows the properties of the active material in the Stock, Map and Mixture modules. Materials always have 123 fixed properties, such as amount, temperature, element analysis, etc. In addition each material may have 133 individual optional custom properties which the user may specify. Usually only a limited number of properties are needed.

The user may select the visible properties using the Filters Dialog, Fig. 3. The Show All selection shows all properties and Show None shows nothing. The Filters Dialog does not delete or remove data or properties, it only makes them visible or invisible. HSC Map remembers the last Filters settings until the user makes more changes.

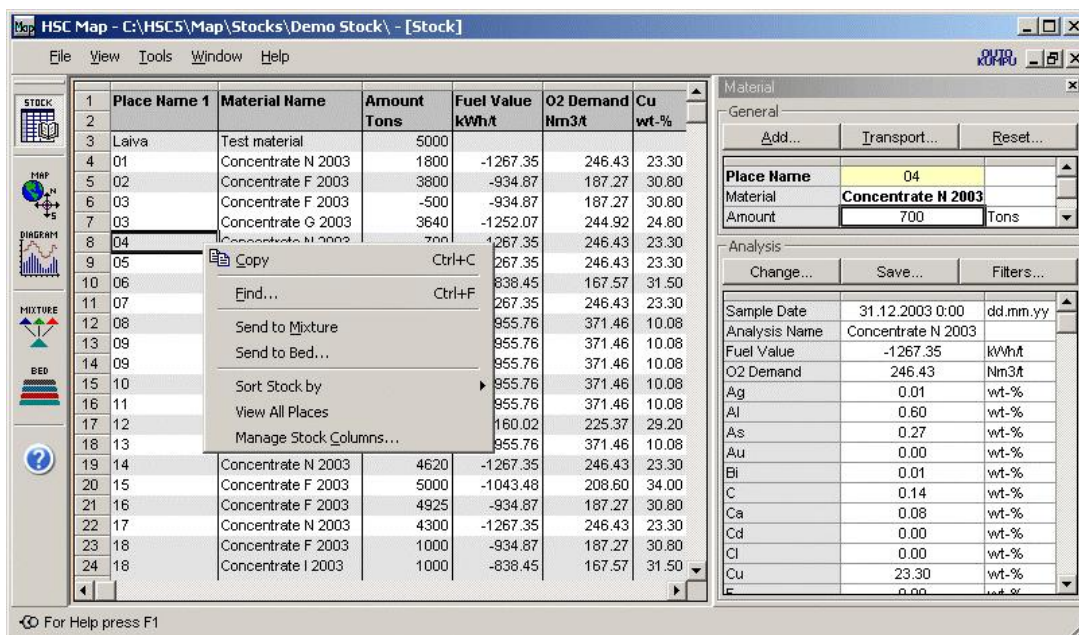


Fig 4. Mouse right-button menu in the Stock module.

The mouse right-button menu in the Stock module may be used to copy data, and also to copy material information to the Mixture and Bed calculators, Fig. 4. The last three options may be used to change the outlook of the Stock module. For example, the last option “**Manage Stock Columns...**” opens a dialog where you can specify the visible columns of the Stock module, Fig. 5.

These menu options have no effect on the data content of the stock databases.

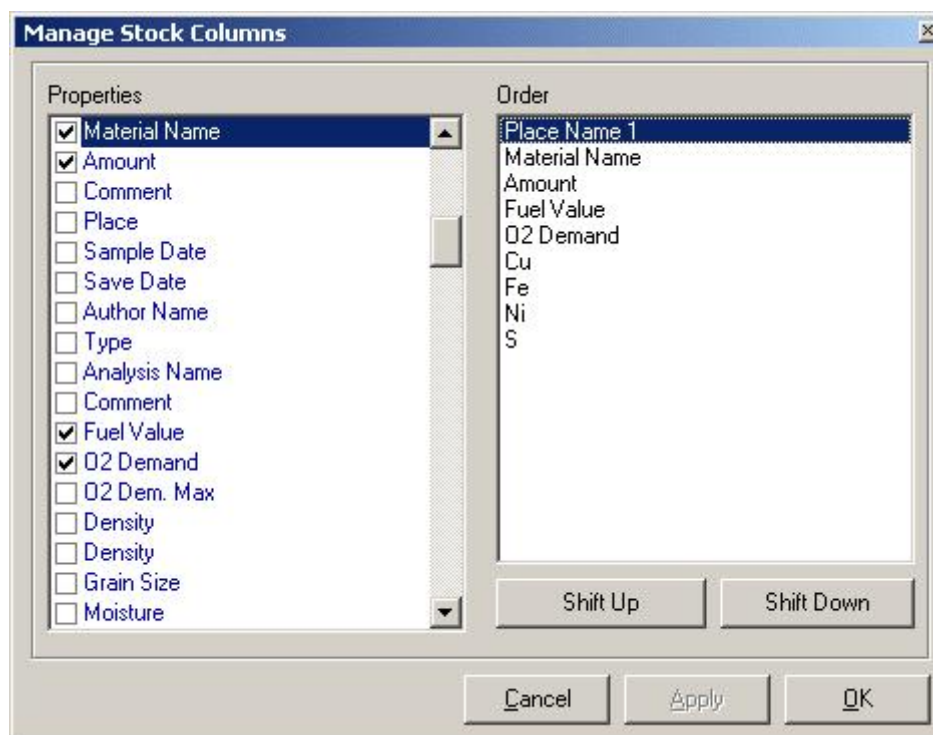


Fig 5. Selection of visible Stock module columns.

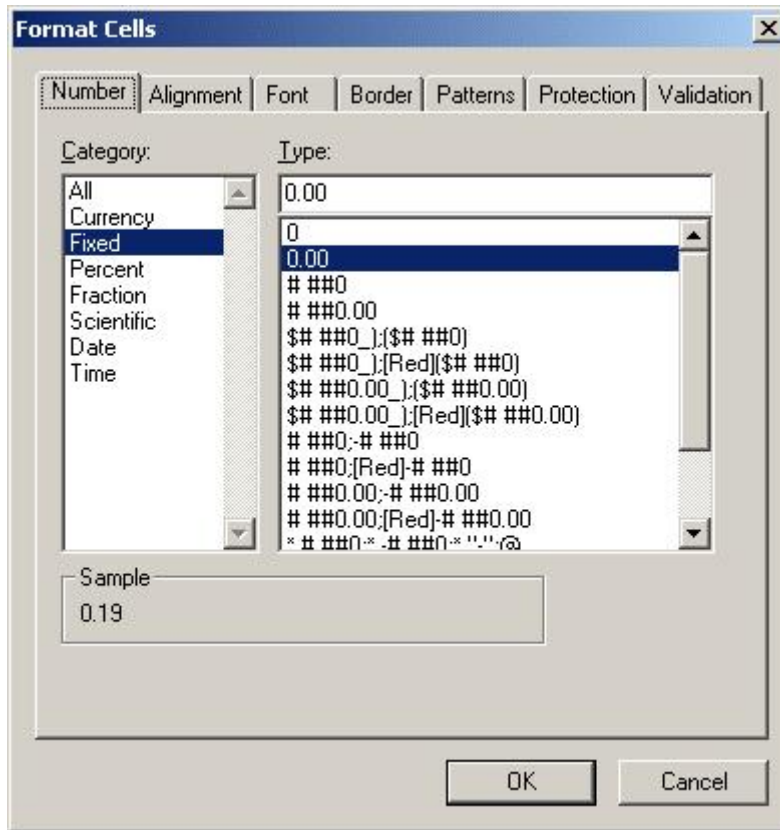


Fig 6. Cell Format dialog.

Cell Format Dialog, Fig. 6 makes possible to change, for example, the number and Alignment format in the Material Toolbar, Fig. 3. This Dialog is quite similar than used in the MS Excel. You may open the Cell Format Dialog by clicking the cell and pressing the right mouse button in Material Toolbar.

54.4 Adding and Selecting Stocks

The stock files may contain confidential business information. Therefore Outotec Research Oy supplies the HSC Map CD with a custom-made default stock file with the user's stock data, i.e.. each plant has a different HSC Map CD. Most geographical maps do not contain confidential data, because these may be bought from public sources.

It is easy to create new stocks in HSC Map using the "File, Create New Stock" dialog, Fig. 7. After creating a new stock the user may activate the stock using the "File, Open Stock" dialog, see Fig. 8. The number of stocks is unlimited. The stock may contain any type of object, like materials, screws, motors, cars, milk, clothes, beer, etc.

The new Stock folder always contains empty Stock, Analysis and History database files in Excel 2000 format. These may be locked and hidden in future if needed.

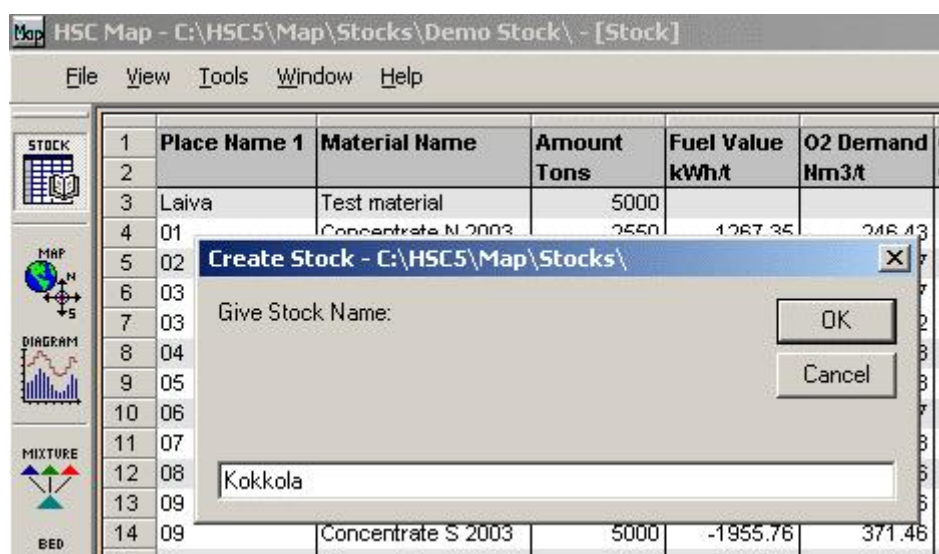


Fig 7. Creating a new stock using the "File, Create New Stock" dialog.

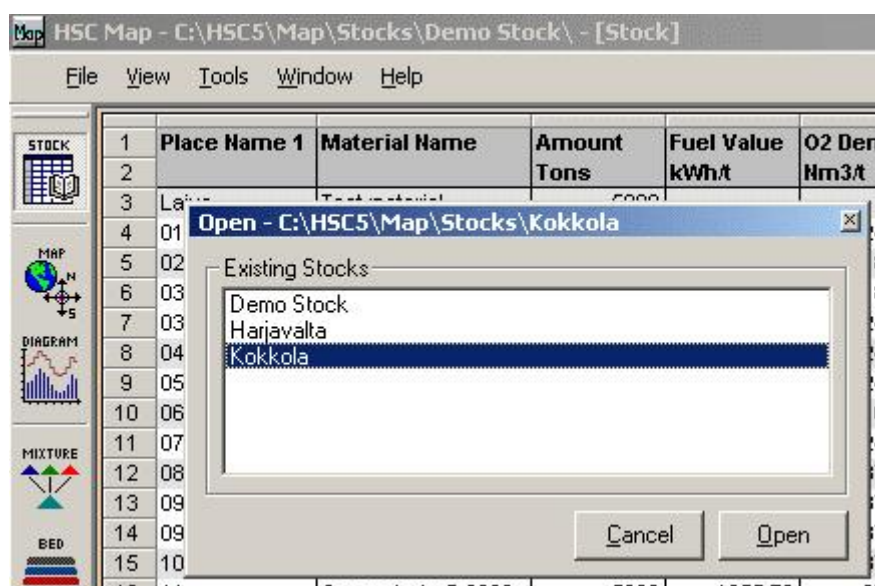


Fig 8. Selecting a new stock using the "File, Open Stock" dialog.

54.5 Adding and Selecting Maps

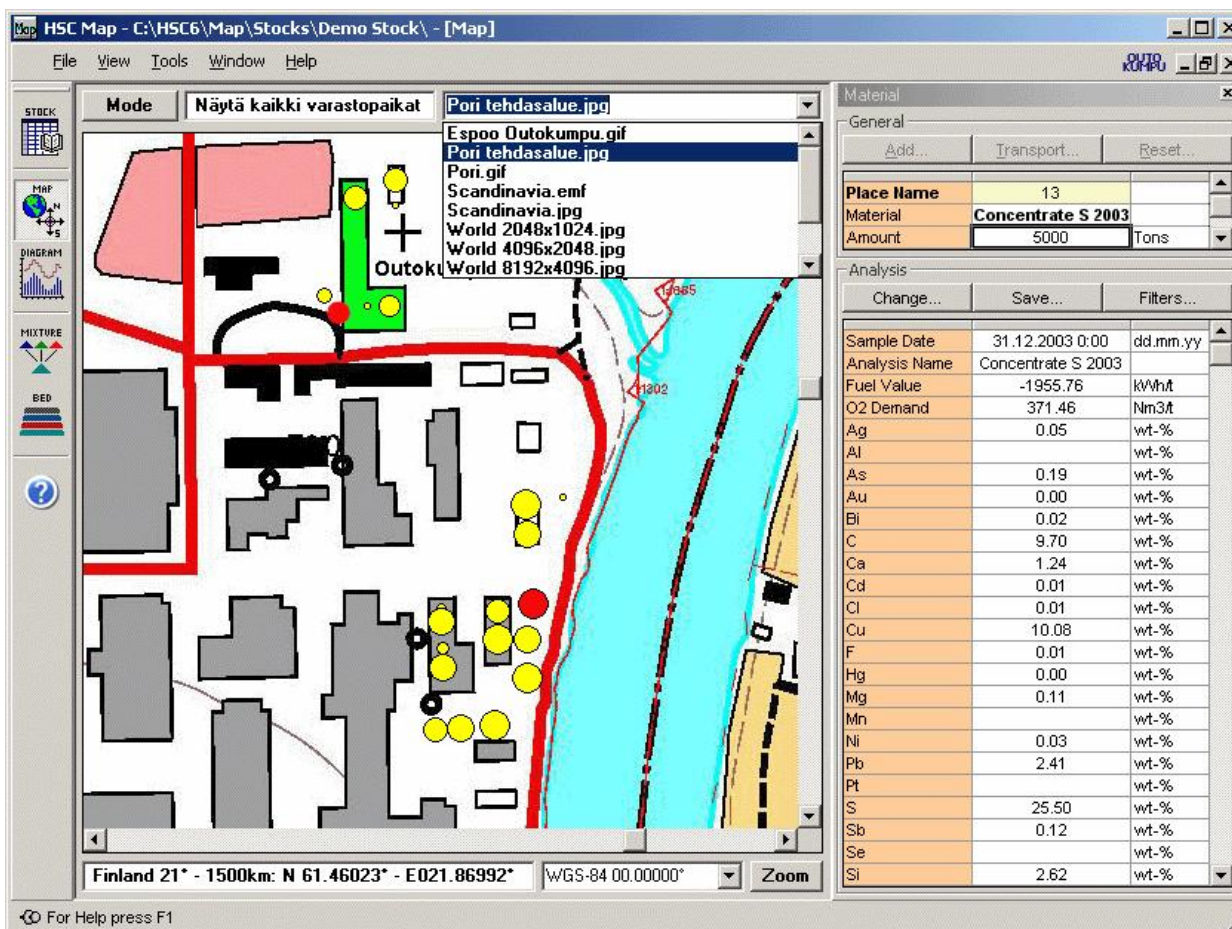


Fig 9. An active map is selected using the drop down list. The stock places can be seen on the map if the place locations exist on the visible map area. The active place is shown in red.

Some default maps are supplied with the HSC Map CD. The HSC installation routine installs these maps in the HSC installation folder, for example:

C:\HSC6\Map\Maps

The user may also add his/her own maps to this same folder. Valid map file formats are:

Bitmaps: JPG, BMP, GIF, etc. (Large zoom setting makes pixels visible)

Vector: EMF, WMF, etc. (Large zoom setting do not show pixels)

Most geographical maps cannot be regarded as confidential business information, because anybody can order such maps from public sources. For example, from:

<http://www.maanmittauslaitos.fi/>

HSC Map version 1.0 supports rectangular map coordinate systems with any **plotting scales**, **origin shift** and **rotation angles**. The same Latitude-Longitude degrees and UTM based kilometers may be used as found from GPS based navigators. See coordinate system details from Chapter 55. Map Basics. The new map must, however, be calibrated before it shows the places and coordinate values.

IMPORTANT: You must always take into account the Copyright issues when you are using the maps.

54.6 Map Calibration

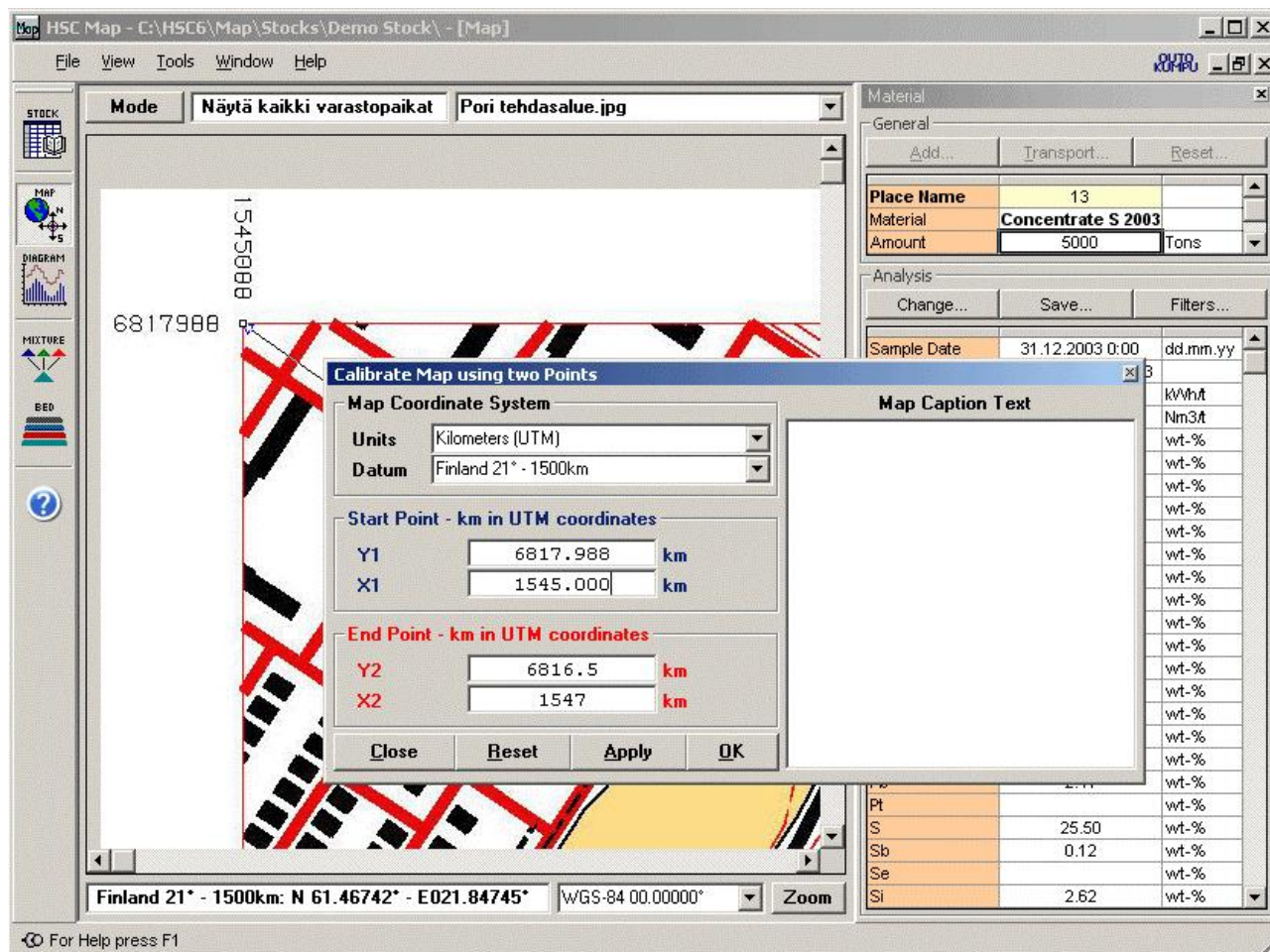


Fig 10. HSC Map calibration dialog. The Map may easily be calibrated by setting the Start and End points of the calibration line.

All maps which are delivered with the HSC Map CD have already been calibrated. However, new maps must be calibrated before they can be used. This is done by selecting “Tools, Calibrate Map, ...” from the main menu.

The Map Calibration dialog is shown in Fig. 10. The basic procedure is:

1. Select map coordinate system, see details from Chapter 55. Map Basics.
2. Move the calibration line Start and End points to the location for which coordinates are available. You may use map grid points as in Fig. 10. or you may select two objects (house, crossroad, border, etc.) from the map whose coordinates you have measured with the GPS navigator. You may scroll map using mouse right button or mouse wheel.
3. Type the Start and End point coordinates in the dialog.
4. You may also type some caption or header to the map if you like.
5. The Apply button calibrates the map using the given data.
6. The OK button calibrates the map and closes the dialog.
7. If you do not want to make changes press Close.
8. The Reset button sets the calibration line at the top left corner of the map.

You may test the map by selecting some point which coordinates you know. Outotec Research Oy main entrance (red point) has been selected in Figs. 11, 12 and 13.

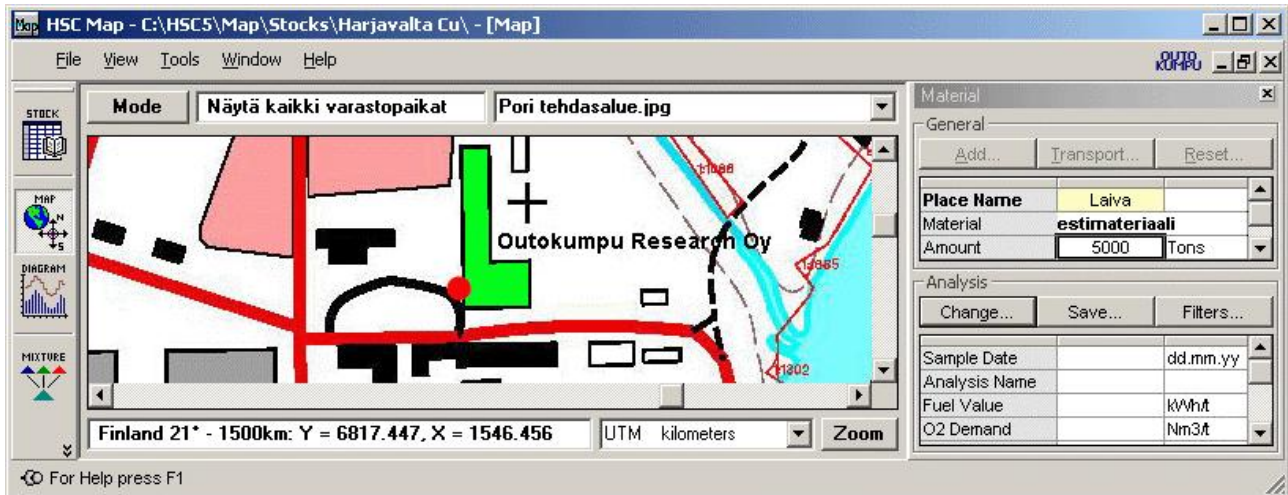


Fig 11. Outotec Research Oy location in UTM kilometer format.

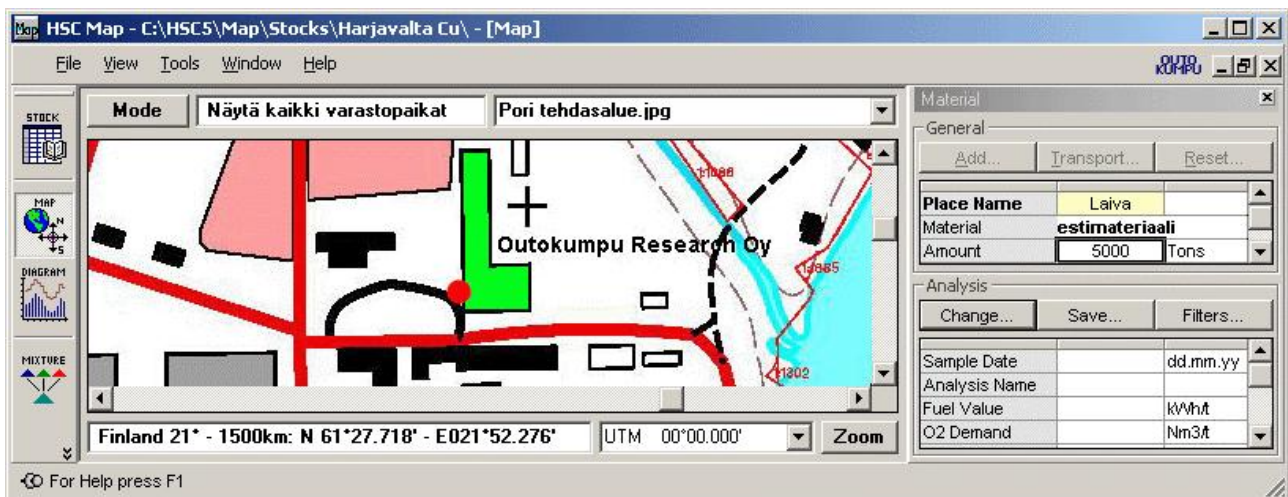


Fig 12. Outotec Research Oy location in UTM Degree format.

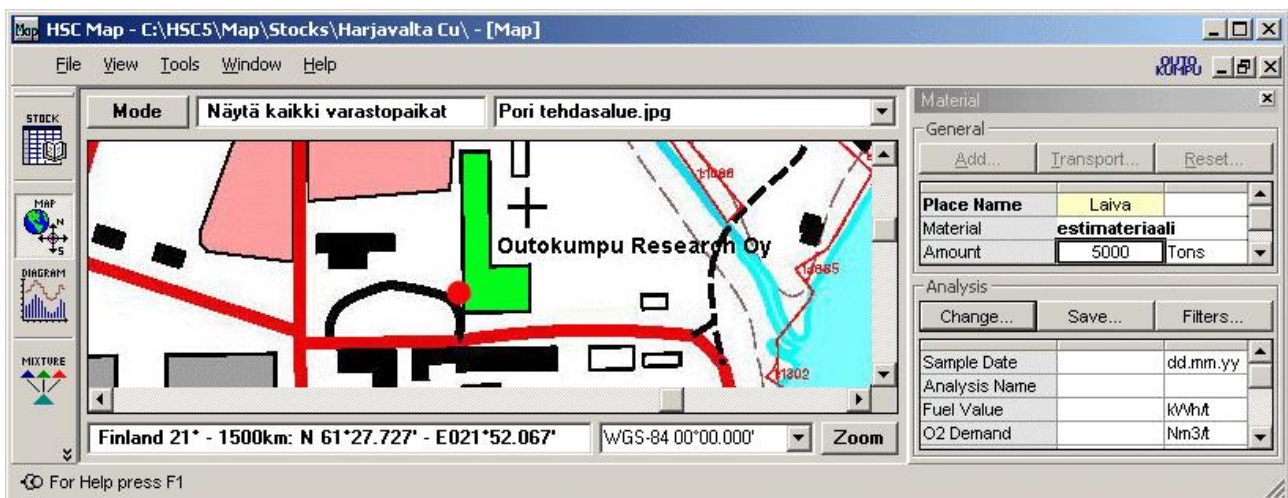


Fig 13. Outotec Research Oy location in WGS-84 Degree format. This format is commonly used by the **GPS navigators**.

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54.7 Adding Places to Stock

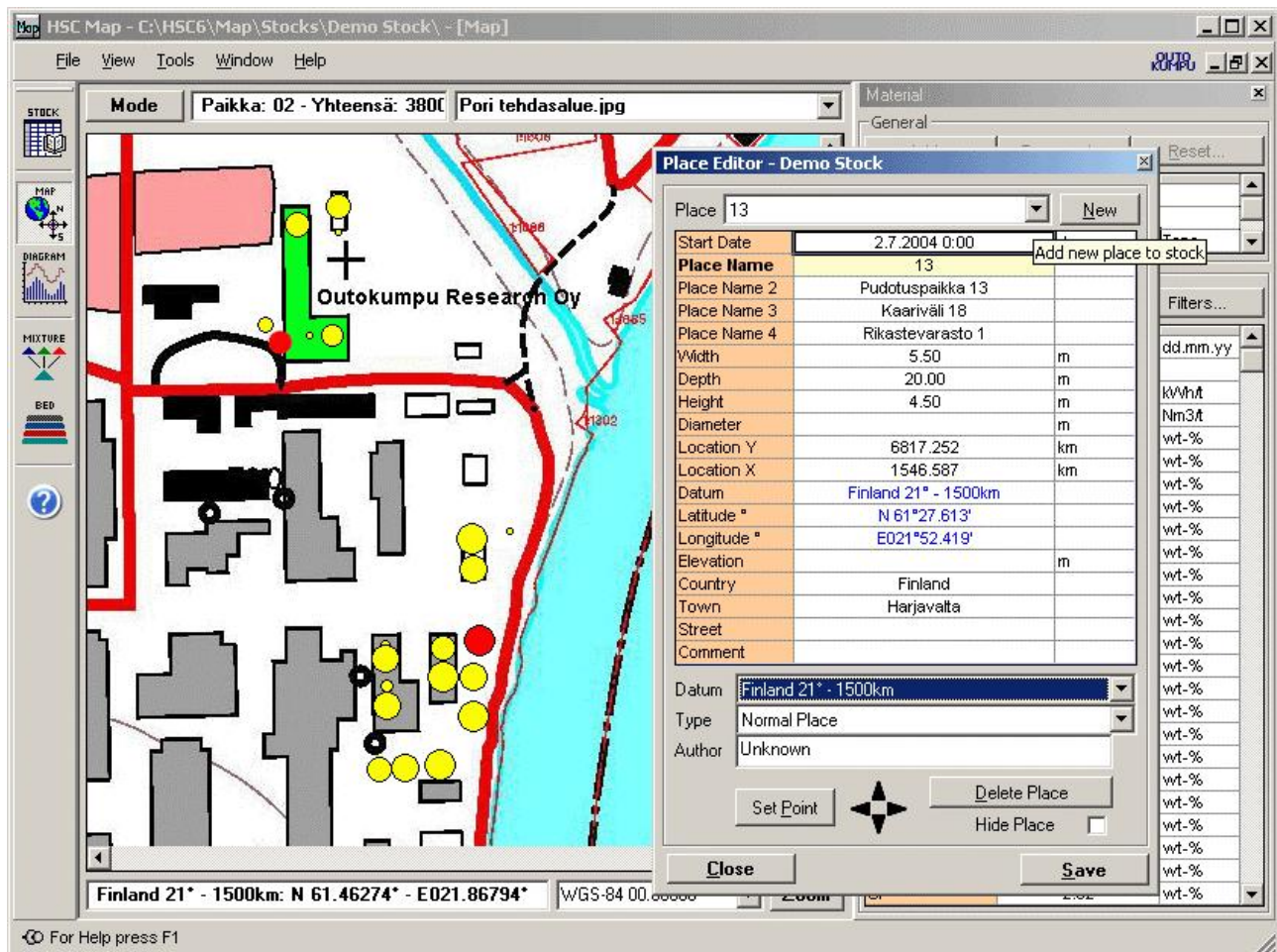


Fig 14. HSC Map Place Editor makes it possible to edit existing places and create new ones.

The default stock that is delivered with the HSC Map CD usually contains the main stock places. However, the user may easily add new stock places using the “Tools, Manage Places...” menu selection and Place Editor tool, Fig. 14. The user may specify up to 20 properties for the place. The location properties must be specified in order to put the place on the map.

The easiest way to specify the place location data is to press “**Set Point**” and click the map on the right location. This procedure may be repeated as often as necessary. You may scroll the map by keeping mouse right button down and moving the mouse.

“**Add New Point**” makes it possible to create a new place by giving a name to the place. Then the other data will be specified using Place Editor, Fig. 14. Four different place types are available:

1. **Virtual Place:** “Recycle bin” which is used to reset material amounts.
2. **Input Place:** Input source for the stock (Ship, train, other stock, etc.)
3. **Normal Place:** Normal stock place (warehouse, bin, heap, etc.)
4. **Output Place:** Output destination (process, ship, train, etc.)

The basic idea is that material only accumulates in the Normal Place.

If the place is not in use then you may hide it using “**Hide Place**”. You may also remove the place from the stock using the “**Delete Place**” dialog. However, it is not recommended to delete places from the stock, because if these places have been used in the History database, then this place information can no longer be retrieved.

Note that you may edit nearly all the place data in the table, and this data will be saved in the Place database when you press “**Save**”. The minimum data needed are:

1. **Start Date** (Automatically created when you add a new place)
2. **Place Name** (Do not use duplicate place names)
3. **Place Type** (Recycle, Input, Normal, Output)

The user identifies the places using a place name. A place name may be renamed because the software identifies the places using the Place ID number, which cannot be changed. The Place ID is not visible to the user.

The user may specify the size, location and address data of the place in the place table. You may use either a kilometer- or degree-based coordinate system. However, you must first specify the coordinate system (map datum). The Place database uses only Latitude-Longitude data to identify the locations in the map.

54.8 Adding Material to Place

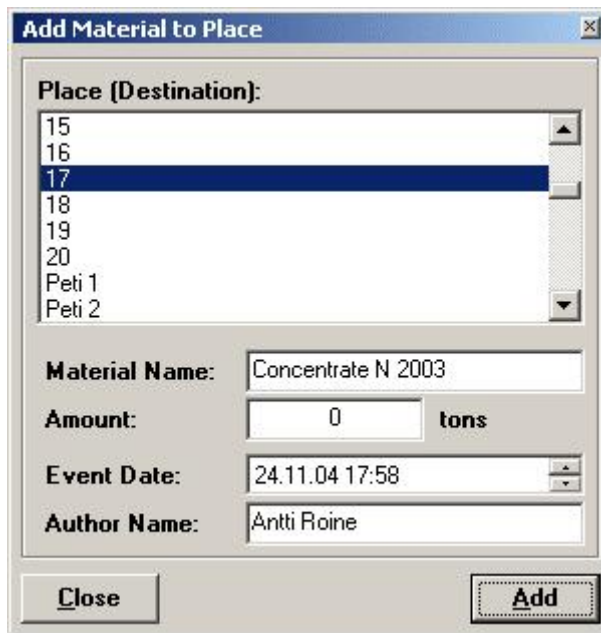


Fig 15. The Add Material Dialog may be used to add new material to a stock place.

Material can only be added to existing stock places. Note that you may add any types of materials to stock places such as concentrates, gases, liquids, screw nuts, motors, cars, etc. Material may have up to 133 user-specified properties.

You may also add several different materials to one stock place. If the material name is the same as one existing in the stock already then the amount will be summed up.

Use the “Add Material to Place” dialog to add material to stock places:

1. Select “Add...” from the Material toolbar, Fig. 14.
2. Select the place from the list, Fig. 15.
3. Give the name of the material. You may use any name, however, it may be wise to follow some rules. For example, the concentrate name and year may be an illustrative name, because the concentrate composition may change (Concentrate N 2004).
4. Give the amount in metric tons.
5. Give the Author Name. You need to give this name only once, because HSC Map will remember the last used Author Name.
6. Press “Add” and “Close”. HSC Map automatically saves the new material information in the Stock and History databases.
7. Specify the composition of the new material by typing in the Material toolbar, Fig. 14, or using the “Change...” dialog. See chapter: “54.11 Analysis Selection Dialog”.

IMPORTANT NOTE: Do not use the “Add Material” dialog to fix errors in material weighing and transporting. Instead please use the “Reset” dialog to reset observed and verified measurement errors. This makes it possible to read the History records correctly.

54.9 Transporting Material

Fig 16. The Transport Material dialog may be used to transport material.

Material may be transported only between existing places. You may carry out the transport in the following way:

1. Select the source place and material from the Stock or Map.
2. Select “**Transport...**” from the Material toolbar, Fig. 14.
3. Select the Destination Place from the list, Fig. 16.
4. Specify the Transfer amount, Fig.16.
5. Press “**Transport**”. This will carry out the transfer and save the changes in the Stock and History databases.

You may also add several different materials to one stock place. If the material name is the same as the existing one in the destination place then the amount will be summed up.

Note that you may carry out a material transfer even if the material amount in the source place is negative. This is because in reality there might be material in the stock, although it should be empty according to the history records.

IMPORTANT NOTE: Do not use the “**Transport Material**” dialog to fix errors in material weighing and transporting. Instead please use the “**Reset**” dialog to reset the observed and verified measurement errors. This makes it possible to read the History records correctly.

54.10 Resetting the Material Amount

	Old tons	New tons
Amount	3640	3000

Fig 17. Reset Material Amount makes it possible to fix errors in the material amounts.

Quite often in the real world the material balance in the stock place is not exactly the same as that calculated from the history records. This may be verified by occasional inventory measurements or simply by resetting the material amount to zero when the place is really seen to be empty.

The material may be removed from the stock by using the “**Remove Row from Stock**” option. This procedure also saves the relevant data in theHistory file. If the material is the last one in the active stock place then the stock place row becomes empty, i.e. it does not delete the empty stock place.

Clear selection closes the dialog.

Clear Place button will clear all the materials from the active place. Ie. it resets the amounts to zero and removes the material names from the place.

Reset button resets only the active material amount.

IMPORTANT NOTE: The only way to read the History records correctly is to carry out the material amount fixes and corrections using the Reset Dialog.

54.11 Analysis Selection Dialog

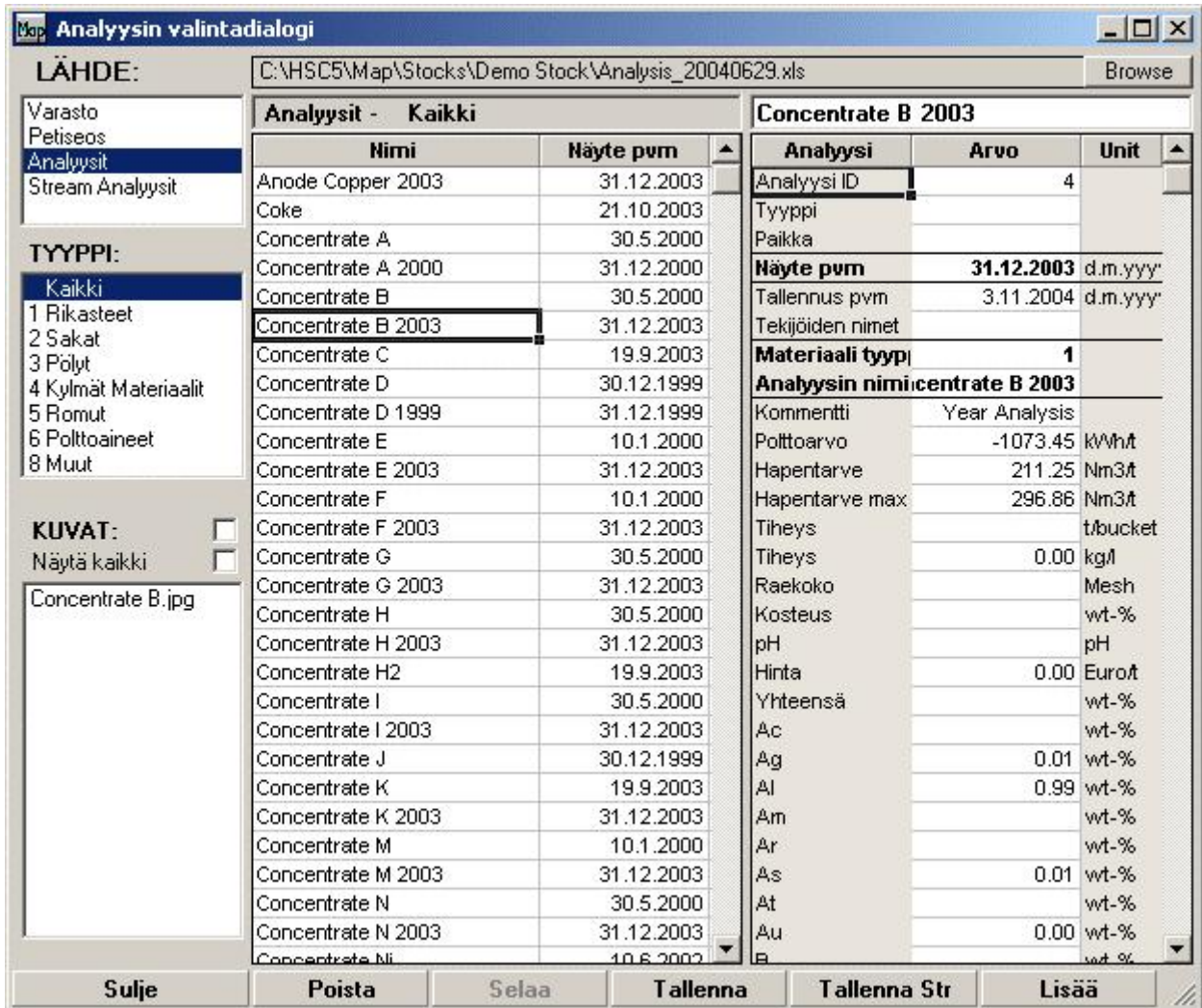


Fig 18. Analysis Selection Dialog.

The Analysis Selection Dialog may be used to pick up analyses for the materials in the Stock, Map and Mixture modules. The Analysis Dialog uses four different **Sources**:

1. Material analyses of Stock materials.
2. Material analyses of Bed mixtures.
3. Analysis Database analyses.
4. Stream file analyses.

The Analysis Type filter (TYYPPI) may be used to show only limited types of materials. The user may change the analysis data in the right hand table and save the new data using “**Save**” in the Analysis database or in the Stream file using “**Save Str**”. “**Remove**” makes it possible to remove the active analysis from the Analysis database or the Stream file.

The user may connect the new analysis to the Stock material by pressing “**Add**” or using the mouse right button menu. The same procedure (and also multi selection) may be used to pick up analyses for the Mixture modules.

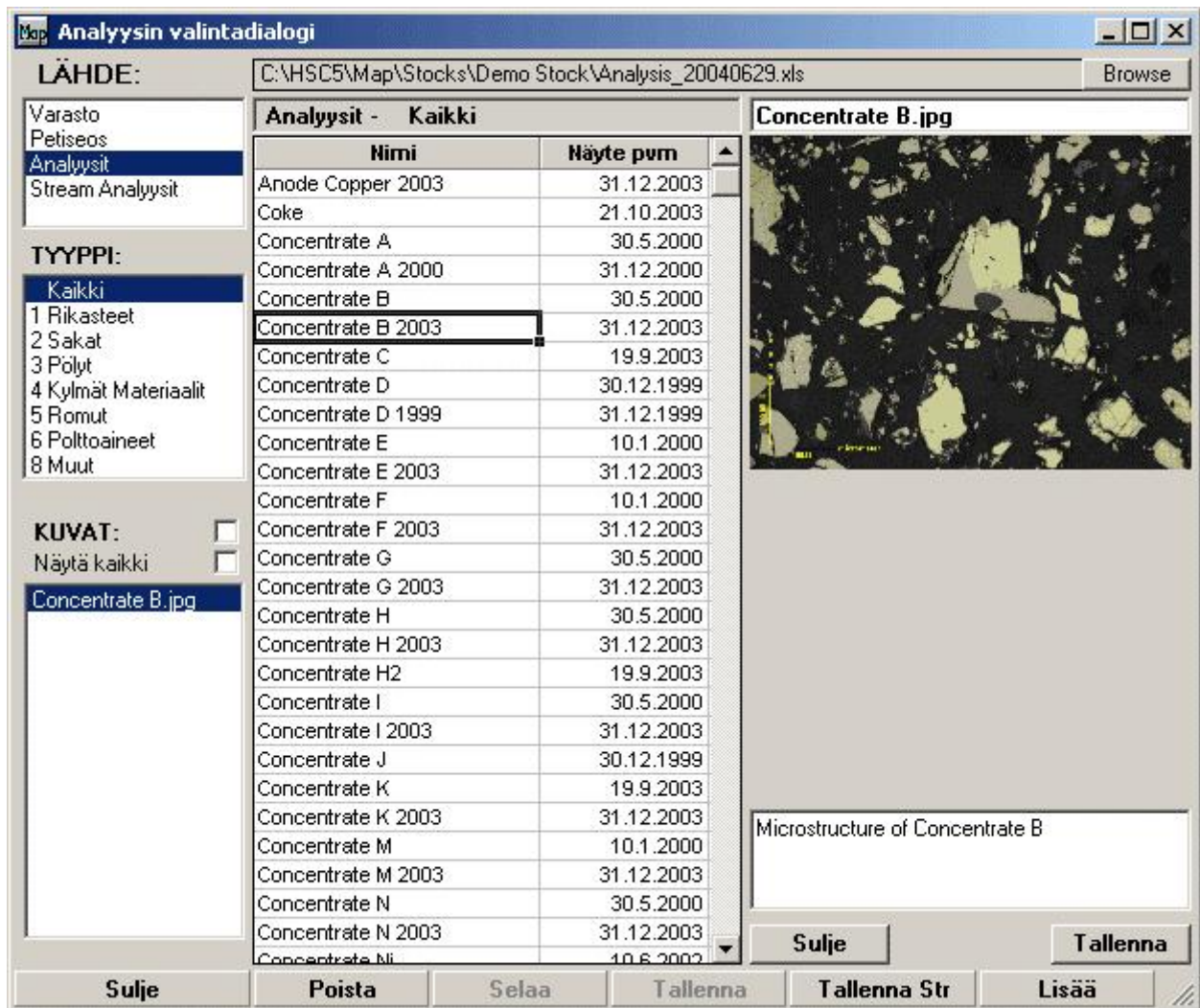


Fig 19. Analysis Selection Dialog with Image selection.

The Analysis Selection Dialog also shows images of the active material. You may enlarge the image to fill the whole screen by clicking it with the mouse. The user may add new images to the C:\HSC6\Map\Photos folder. The Analysis Dialog shows all the photos where the name starts with the same word as that of the active material, i.e. Concentrate B...

Nearly any type of photo may be used. Photos may be extremely useful when classifying different scrap materials. The photos may have a text caption which may be edited.

54.12 Combining Two Analyses

Analysis	1	2	United	Unit
Analyysi ID	42	70	70	
Tyyppi				
Paikka				
Häyte pvm	8.7.2004	31.12.2003	31.12.2003	d.m.yyyy
Tallennus pvm	1.11.2004	3.11.2004	3.11.2004	d.m.yyyy
Tekijöiden nimet				
Materiaali tyyppi	1	1	1	
Analyysin nimi	Concentrate S	Concentrate S 2003	Concentrate S 2003	
Kommentti		Year Analysis	Year Analysis	
Polttoarvo	-1395.73	-1955.76	-1955.76	kWh/t
Hapentarve	269.06	371.46	371.46	Nm ³ /t
Hapentarve max	372.99	449.12	449.12	Nm ³ /t
Tiheys				t/bucket
Tiheys		3.00		kg/l
Raekoko				Mesh
Kosteus				wt-%
pH				pH
Hinta	0.00	0.00	0.00	Euro/t
Yhteensä				wt-%
Ac				wt-%

Fig 20. Analyses Combination Dialog.

The mouse right button popup menu selection “Unite Analysis 1 to 2” opens the “Unite Analysis Dialog, see Fig. 18. This tool may be used to combine an old analysis of the same material with a new one and to find all the available element analyses.

The “Unite Analysis” dialog makes it possible to combine two analyses in two ways. The “**Replace Empty Fields**” selection uses Analysis 1 data rows only if the corresponding row of Analysis 2 is empty. “**Replace Available Fields**” makes the replacement if Analysis 1 data is available. In fact the user may also change the data manually.

The “**Save**” selection saves the combined analysis in the Analysis Database.

54.13 HSC Map Databases

HSC Map uses four database tables for each stock, Fig. 21. The HSC Map user may view the contents of these tables using the “View, Database...” menu selection. Please do not edit these tables if you are not absolutely sure of what you are doing. You may also use MS Excel to edit these tables. However, never:

1. Insert or remove columns.
2. Mess up Place ID data. HSC Map uses Place ID to connect Materials and Places with each other.
3. Delete Place row if it is used in the Material or History table.

Database C:\YB6\Map\Map\Stocks\Demo Stock\Stock_20040629.xls

File

Material Analysis Places History

	A	B	C	D	E	F	G
1	Place ID	Place Name	Change Date	Material Name	Amount	Comment	
2	Paikka ID	Paikan nimi	Muutos pvm	Materiaalin nimi	Saldo	Kommentti	
3					tons		
4	1	NULL		Cu Fines 2.10.2002	0		
5	1	NULL	24.9.2004 00:00	Cu Fines 2.10.2002	3 51		
6	1	NULL	24.9.2004 00:00	Matte X 18.6.99	2 52		
7	2	1		Test material	5000		
8	3	46	24.9.2004 00:00	Concentrate N 2003	1800		
9	4	9	22.9.2004 00:00	Concentrate F 2003	3800		
10	5	9	23.9.2004 00:00	Concentrate F 2003	-500		
11	5	11	24.9.2004 00:00	Concentrate G 2003	3640		
12	6	46		Concentrate N 2003	5000		
13	7	46	22.9.2004 00:00	Concentrate N 2003	4440		
14	8	35	24.9.2004 00:00	Concentrate I 2003	1315		

Fig 21. HSC Map Database Tables. The Material table contains the list of available materials. The user and also the software uses the material name internally as a keyword. Therefore it is sensible to use illustrative material names.

Database C:\YB6\Map\Map\Stocks\Demo Stock\Analysis_20040629.xls

File

Material Analysis Places History

	D	E	F	G	H	I	J	K	
1	Sample Date	Save Date	Author Names	Material Type	Analysis Name	Comment	Fuel Value	O2 Demand	O2
2	Näyte pvm	Tallennus pvm	Tekijöiden nimet	Materiaali tyyppi	Analyyysin nimi	Kommentti	Polttoarvo	Hapentarve	Hapent
3	d.m.yyyy	d.m.yyyy					kWh/t	Nm3/t	
4	30.5.2000	1.11.2004		1	Concentrate A		-1123.60	220.89	
5	31.12.2000	3.11.2004		1	Concentrate A 2000	Year Analysis	-1107.72	217.33	
6	30.5.2000	1.11.2004		1	Concentrate B		-903.21	178.82	
7	31.12.2003	3.11.2004		1	Concentrate B 2003	Year Analysis	-1073.45	211.25	
8	19.9.2003	1.11.2004		1	Concentrate C		-1033.44	205.56	
9	30.12.1999	1.11.2004		1	Concentrate D		-1146.04	225.35	
10	31.12.1999	3.11.2004		1	Concentrate D 1999	Year Analysis	-1044.03	206.07	
11	31.12.2003	3.11.2004		4	Anode Copper 2003	Year Analysis	-3.55	0.42	
12	10.1.2000	1.11.2004		1	Concentrate E		-1141.24	223.25	
13	31.12.2003	3.11.2004		1	Concentrate E 2003	Year Analysis	-1118.94	220.66	
14	10.1.2000	1.11.2004		1	Concentrate F		-1043.48	208.60	

Fig 22. The Analysis table contains the data of all available analyses. Use “Analysis Selection Dialog” (Chapter 54.11) to edit these analyses.

	A	B	C	D	E	F	G	H	I	
1	Place ID	Place Type	Start Date	End Date	Author Names	IP Address	Place Name 1	Place Name 2	Place Name 3	Place
2	Paikan ID	Paikan tyyppi	Perustamis pvm	Lopetus pvm	Tekijän nimet	PC IP	Nimi	Varasto	Kaariväli	Pudoti
3			d.m.yyyy	d.m.yyyy						
4	1	0	2.7.2004		Admin		NULL	NULL	NULL	NULL
5	2	1	2.7.2004		Jarkko		Laiva	Laiva	Laiva	Laiva
6	3	2	2.7.2004		Jarkko		01	Pudotuspaikka 1	Kaariväli 1-3	Rikast
7	4	2	2.7.2004		Jarkko		02	Pudotuspaikka 2	Kaariväli 4-5	Rikast
8	5	2	2.7.2004		Jarkko		03	Pudotuspaikka 3	Kaariväli 6	Rikast
9	6	2	2.7.2004		Jarkko		04	Pudotuspaikka 4	Kaariväli 7	Rikast
10	7	2	2.7.2004		Jarkko		05	Pudotuspaikka 5	Kaariväli 8	Rikast
11	8	2	2.7.2004		Jarkko		06	Pudotuspaikka 6	Kaariväli 9	Rikast
12	9	2	2.7.2004		Jarkko		07	Pudotuspaikka 7	Kaariväli 10	Rikast
13	10	2	2.7.2004		Jarkko		08	Pudotuspaikka 8	Kaariväli 11	Rikast
14	11	2	2.7.2004		Jarkko		09	Pudotuspaikka 9	Kaariväli 12-13	Rikast

Fig 23. The Places table contains the data of available places in the stock. Do not delete any place used in the Material or History table. Please use “Place Editor” to edit the place data. The user may use place names to identify the places, however, the software uses Place ID to identify the place, and the ID number may be in any order.

	A	B	C	D	E	F	G	H	
1	Start Date	Save Date	Material Name	Total	Transfer	Source ID	Source Name	Source Amount	De:
2	Ajoon pvm	Tallennus pvm	Materiaalin nimi	Saldo	Siirto	Lähde ID	Lähteen nimi	Lähde saldo	M
3	dd.mm.yy hh:mm	dd.mm.yy hh:mm		tons	tons			tons	
19	20.9.2004 00:00	23.11.2004 12:00	Cu Fines 2.10.2002	999988	3	51	Piha 2	999988	
20	20.9.2004 00:00	23.11.2004 12:00	Matte X 18.6.99	999992	2	52	Piha 3	999992	
21	20.9.2004 00:00	23.11.2004 12:00	Concentrate I 2003	2825	150	8	06	1625	
22	20.9.2004 00:00	23.11.2004 12:00	Concentrate S 2003	27220	150	10	08	3600	
23	20.9.2004 00:00	23.11.2004 12:00	Concentrate N 2003	20340	150	3	01	1950	
24	20.9.2004 00:00	23.11.2004 12:00	Concentrate S 2003	27065	155	12	10	4085	
25	20.9.2004 00:00	23.11.2004 12:00	Concentrate N 2003	20280	60	16	14	4680	
26	20.9.2004 00:00	23.11.2004 12:00	Concentrate F 2003	14390	15	18	16	4940	
27	20.9.2004 00:00	23.11.2004 12:00	Silica Flux	0	160	50	Piha 1	997590	
28	20.9.2004 00:00	23.11.2004 12:00	Concentrate Sec 2003	999440	140	53	Piha 4	999440	
29	20.9.2004 00:00	23.11.2004 12:00	Concentrate G 2003	3940	300	5	03	3940	

Fig 24. The History table contains the records (rows) of every material amount or analysis change. The History table is used to draw diagrams.

The Caption shows the path to the database files, which you may edit with MS Excel. These database files may be locked and hidden in future if necessary.

IMPORTANT: Please note that you may save backup files of the Analysis.XLS, Stock.XLS and History.XLS files using the “File, Create Backup Files” selection. This will save backup files using the original names completed with the backup date.

54.14 Mixture Calculator

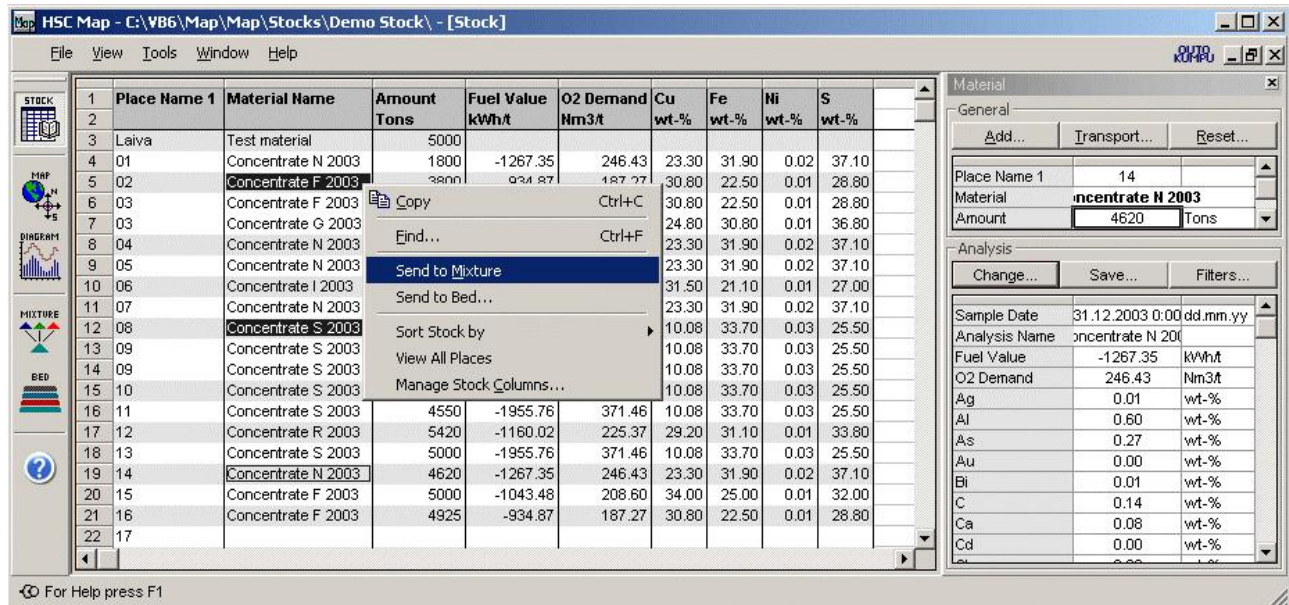


Fig 25. Three materials have been selected from the Stock list for the mixture. The “Send to Mixture” option is opened using the right mouse button.

HSC Map Mixture calculator may be used to calculate compositions of one or many combined mixtures. The mixture materials may be collected from the stock list, analysis database or from the stream files using the right mouse button. The selected materials end up on the active sheet and row of the Mixture calculator, see Fig. 26.

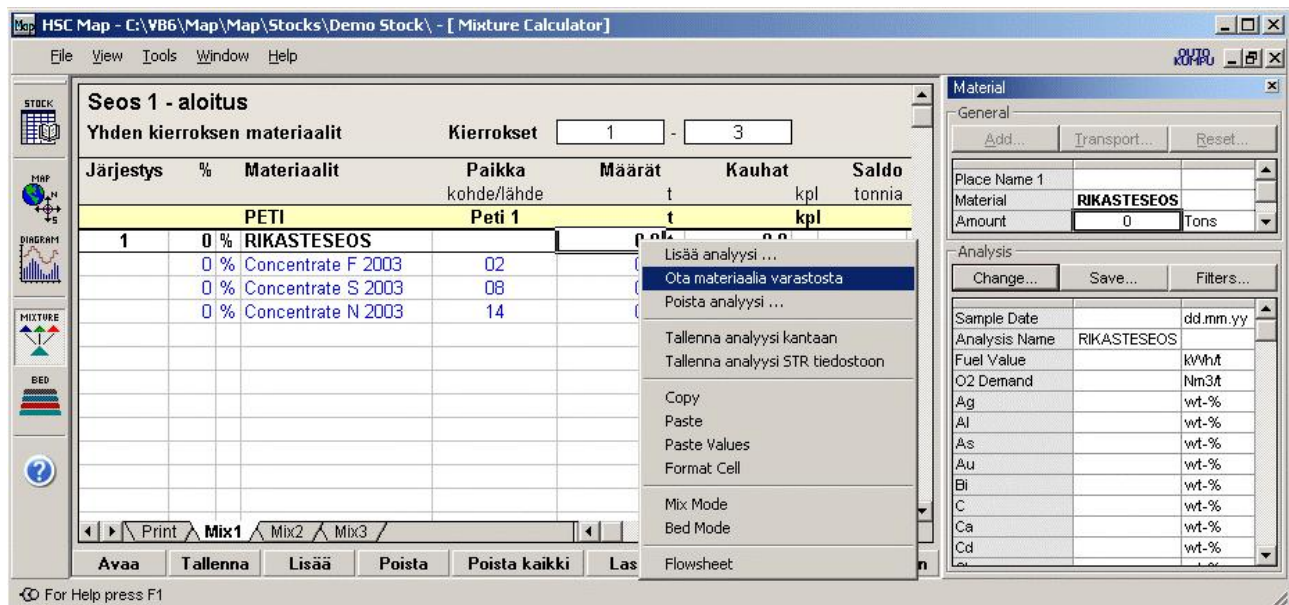


Fig 26. Three materials have been copied from the Stock list to the Mixture Calculator.

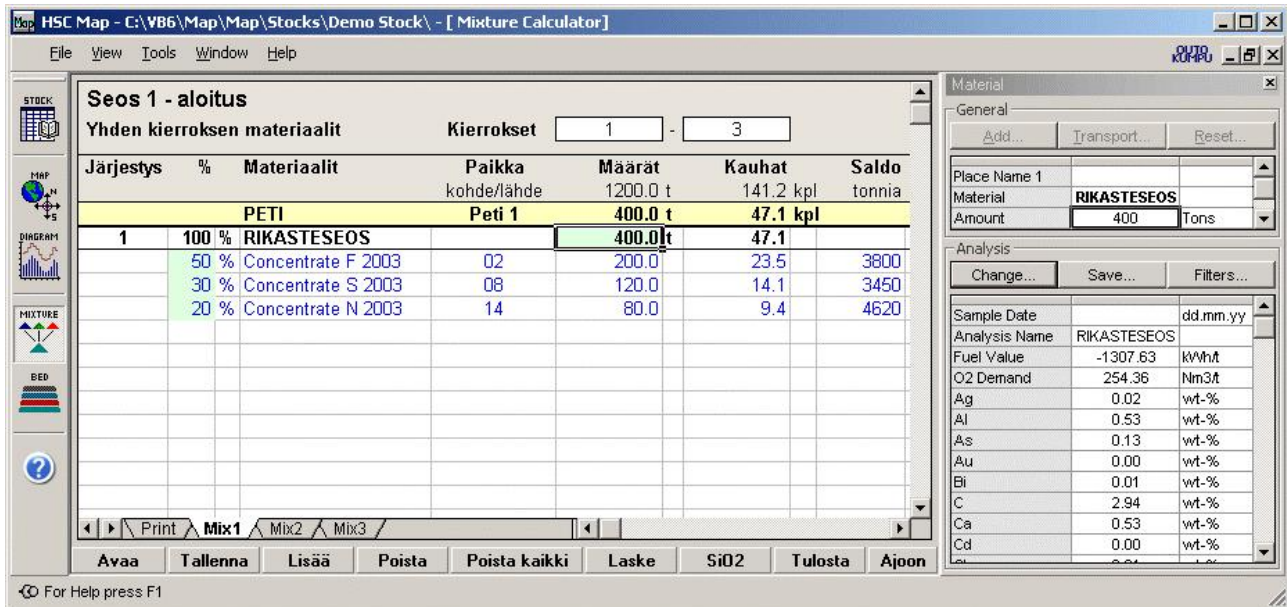


Fig 27. Calculated mixture (Rikasteseos) composition.

The user must specify the total amount (400 t) of the mixture and the composition (50, 30, 20 %), i.e. the cells marked in green in Fig. 27. The calculator then shows the mixture composition on the Material Toolbar if the mixture row is active.

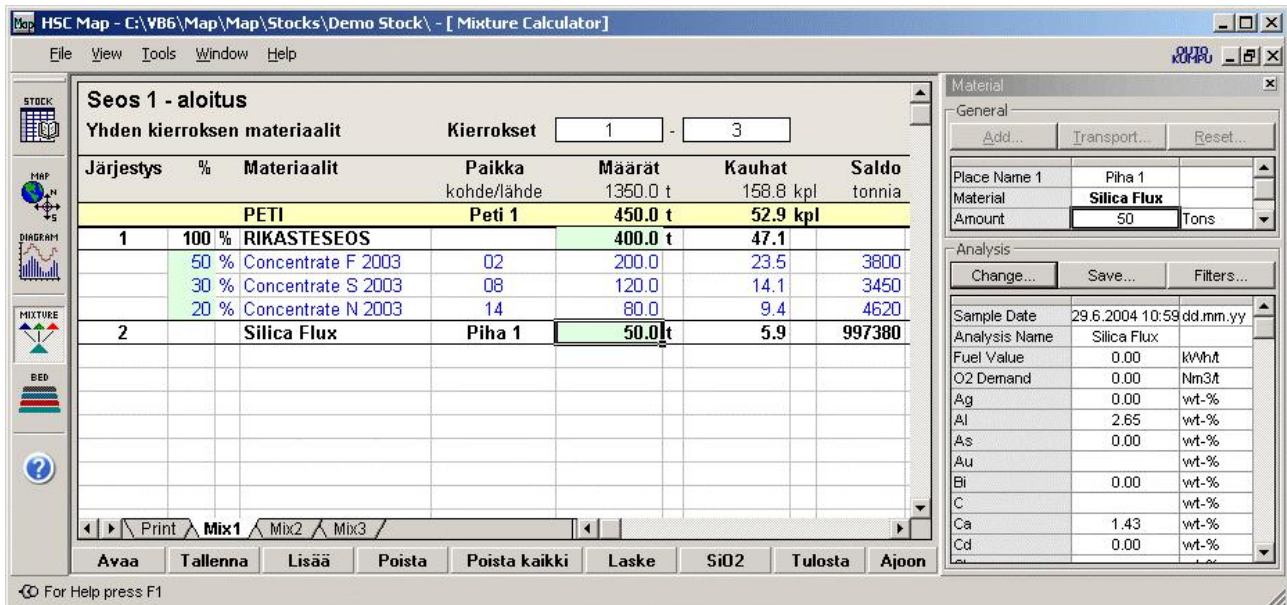


Fig 28. Two mixtures (Rikasteseos and Silica Flux) on the same sheet.

The user may specify any number of mixtures on one sheet, Fig. 28. The Material Toolbar shows the composition of the active row. The user may change the compositions of the mixture materials, and this has no effect on the Stock or Analysis databases, unless this analysis is saved using “Save...”.

All mixture sheets **Mix1**, **Mix2** and **Mix3** are identical and may be used in the same way. The “multi mixture” composition may be found from the row marked in yellow. **Rounds** (Kierrokset) selection may be used to multiply the amount of the mixture.

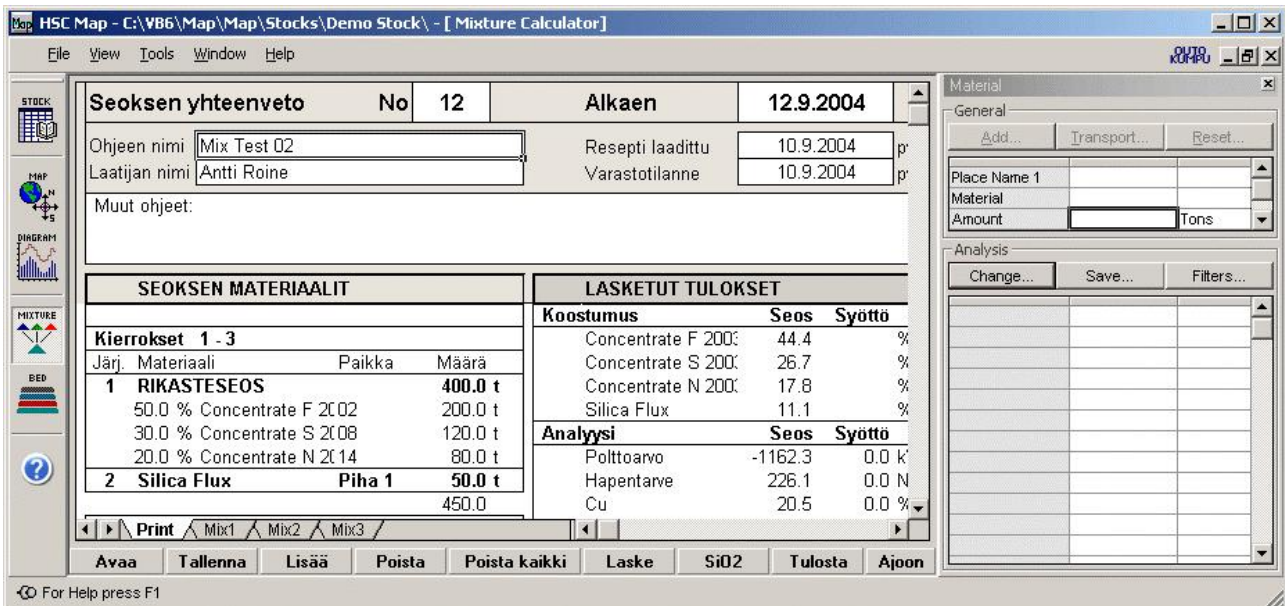


Fig 29. Calculated multi mixture composition based on mixtures in Mix1, Mix2 and Mix3.

The total “multi mixture” composition of all the Mix1, Mix2 and Mix3 sheets may be calculated by pressing “Calculate” (Laske). The results are shown on the Print sheet, Fig. 29.

The user may give the name, author and date information for the calculated mixture and save this mixture using Save (Tallenna) button. The saved mixture files have a “.mix” suffix. Saving the mixture has no effect on the Stock, Analysis and History databases.



Fig 30. The Material Transfer dialog creates a summary of all the material changes.

The “Run” (Ajoon) button may be used to transfer the mixture materials from the original stock places to the destination place of the mixture. The Material Transfer dialog shows the summary of all the material changes with material name, amount, balance, source and destination places.

IMPORTANT: Please remember to check that the start date, author name and other data are OK before your accept the transfer using “Run” (Ajoon) because this routine carries out the transfer and saves all the changes in the History table.

54.16 Using Mixtures in HSC Sim

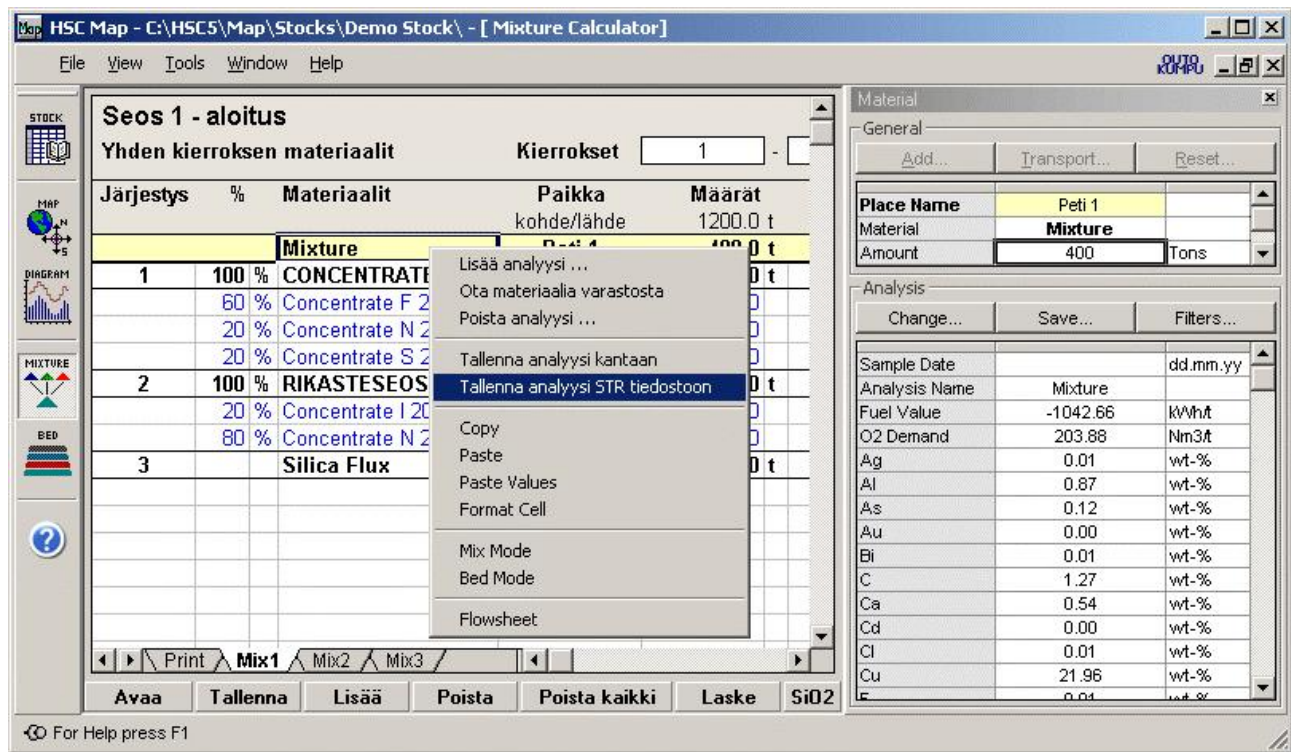


Fig 35. The right mouse menu of the Mixture and Bed modules.

The “**Tallenna analyysi STR tiedostoon**” selection of the mouse right menu makes it possible to save the analysis of the mixture or any other active material row in the STR –file, which may be used as a feed mixture in the HSC Sim Process Calculator module. The direct use of this STR file in the HSC Sim Flowsheet module is under construction.

54.17 Diagrams

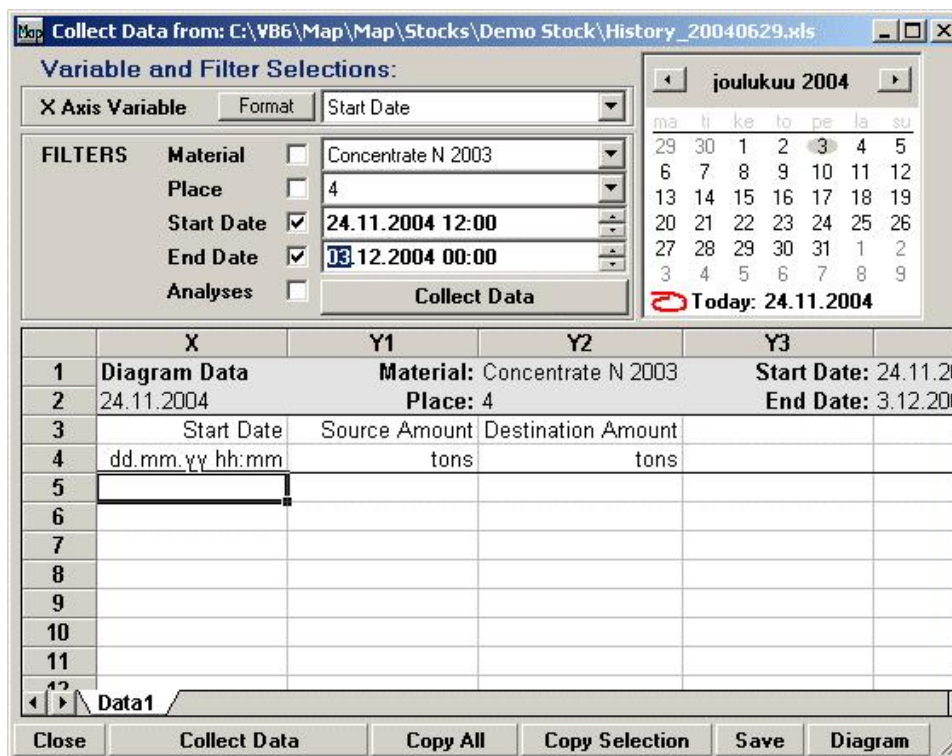


Fig 36. Diagram Data specification dialog.

The HSC Map Diagram module is made for drawing diagrams of History data. For example, it may be used to illustrate the decrease of some raw material amount in the stock as a function of time. The default x-axis is always the change event date and the y-axis is usually the amount in metric tons. However, the user may select also other axis units.

The Diagram module may be activated by pressing the **Diagram** button on the left side of the screen, Fig. 34. Then you must press **Get Data** to specify the data which is collected to the diagram. The Collect Data dialog makes it possible to specify the x- and y-axis data which is collected to the diagram.

First select the x- and y-axis data types, then specify the material and place and the start and end dates, see Fig. 36. When this is done you may press **Collect Data**, which will collect data from the History file, Fig. 37. Note that Diagram module does not make any changes to the HSC Map database files. So you may test freely.

When you are happy with the collected data you may press the Diagram button (Fig. 37) to see the diagram, Fig. 38. You may also **Copy-Paste** the data to Excel or save the data table in Excel format using the **Save** dialog.

You may change the number format of the x- and y-axis using the **Format** button, Fig. 37, or by clicking the axis, Fig. 38.

The aim is to improve the **Filter** and **Format** options in Fig. 36 on the basis of HSC Map user feedback after the first HSC Map version is ready. This will be an easy task when the basic HSC Map program routines are ready.

Outotec Research Oy
Antti Roine, Jarkko Mansikka-aho, Janne Palosaari

August 10, 2006

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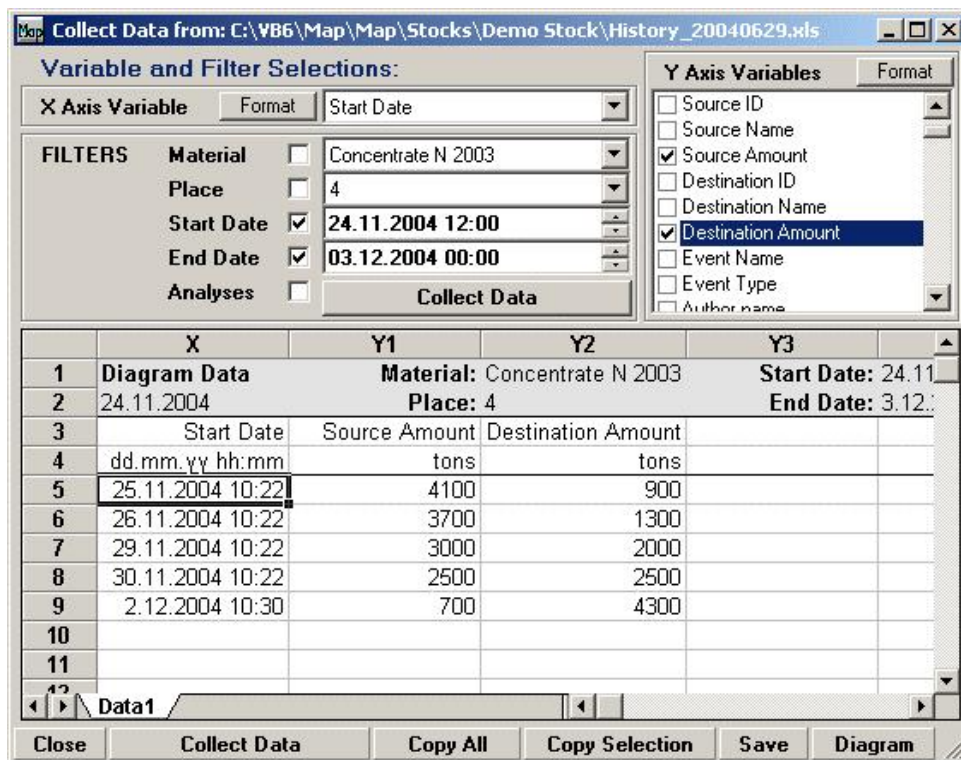


Fig 37. Diagram Data have been specified and collected.

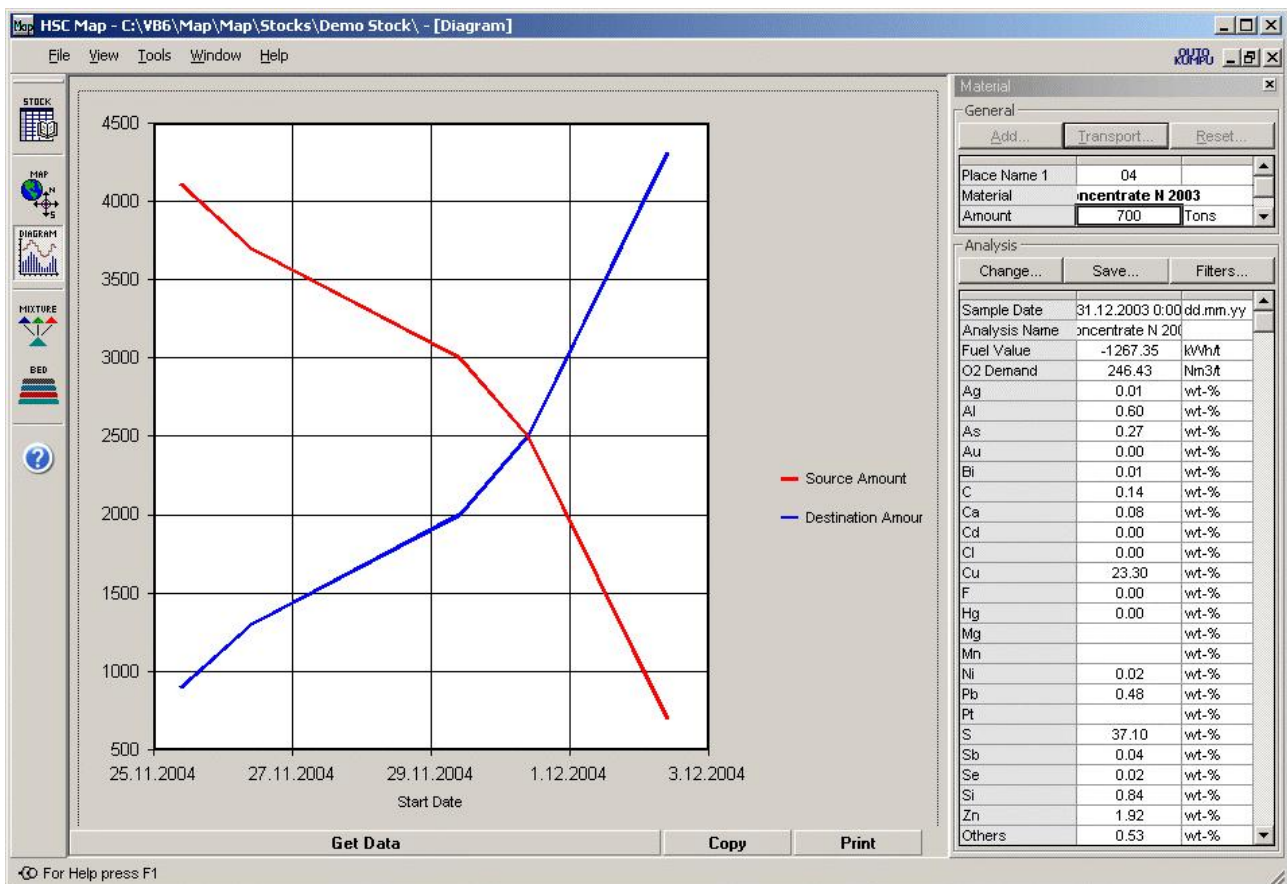


Fig 38. Final Diagram with the specifications shown in Fig. 37.

54.18 Map View Mode

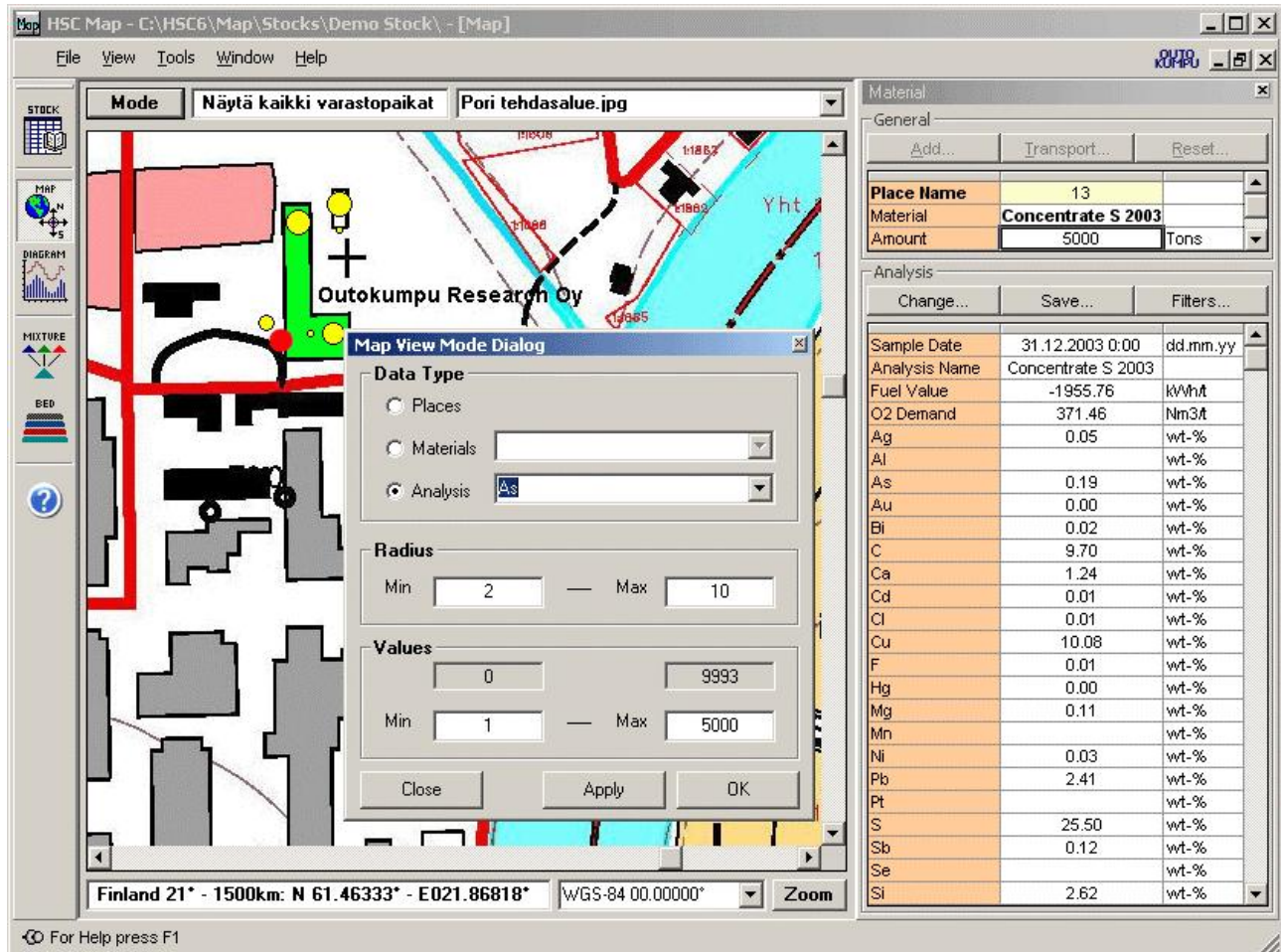


Fig 39. Map View Mode.

The Map View Mode dialog makes it possible to specify the data type which is used to draw the place points to the map. The **Mode** button is used to open this dialog. Three types of data may be drawn on the map:

1. **Place:** This shows all places. The diameter of the point illustrates the amount of material in this place.
2. **Materials:** This will show the places which contain selected material. The diameter of the point illustrates the amount of the material.
3. **Analysis:** This selection may be used to find the places which contain a lot of silver, copper, sulfur or any of the available analysis properties.

The **Radius** range specifies the size of the smallest and largest point. The **Values** range specifies the smallest and largest value used to draw the points. For example, if the value is larger than the specified maximum value the point radius gets the maximum value.

In the next HSC Map version a lot of new properties may well be added to the Map View Mode Dialog according to user feedback.