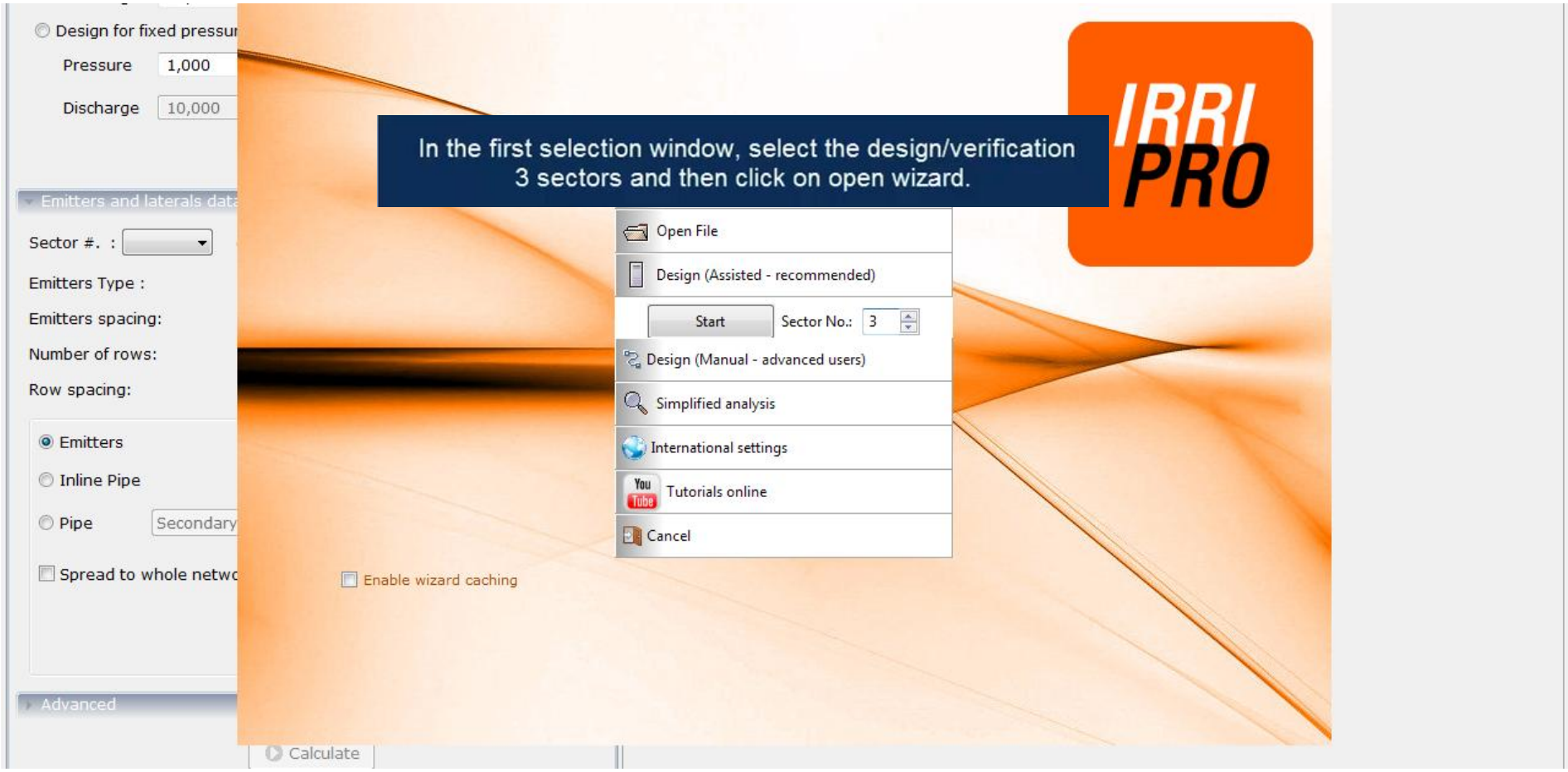
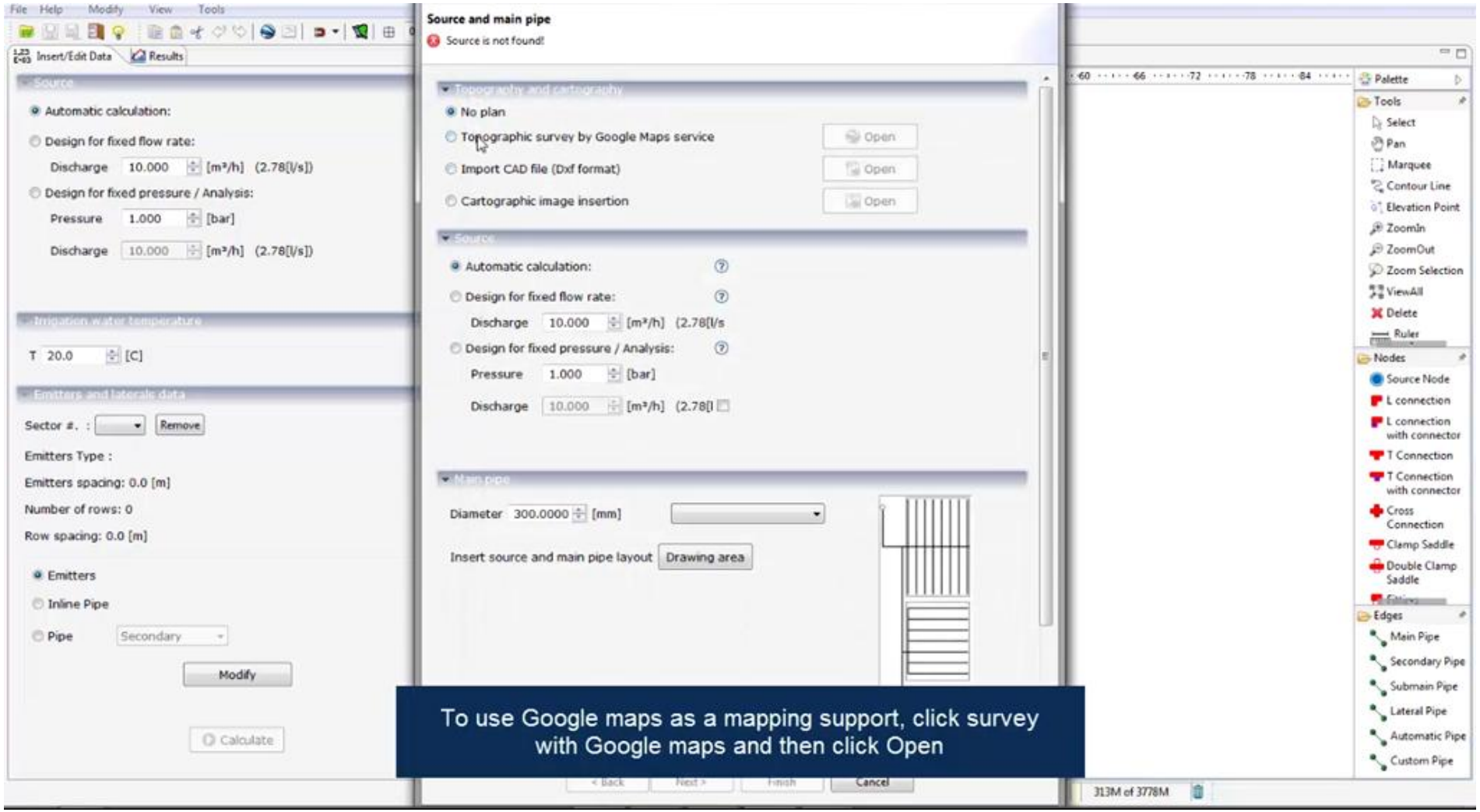
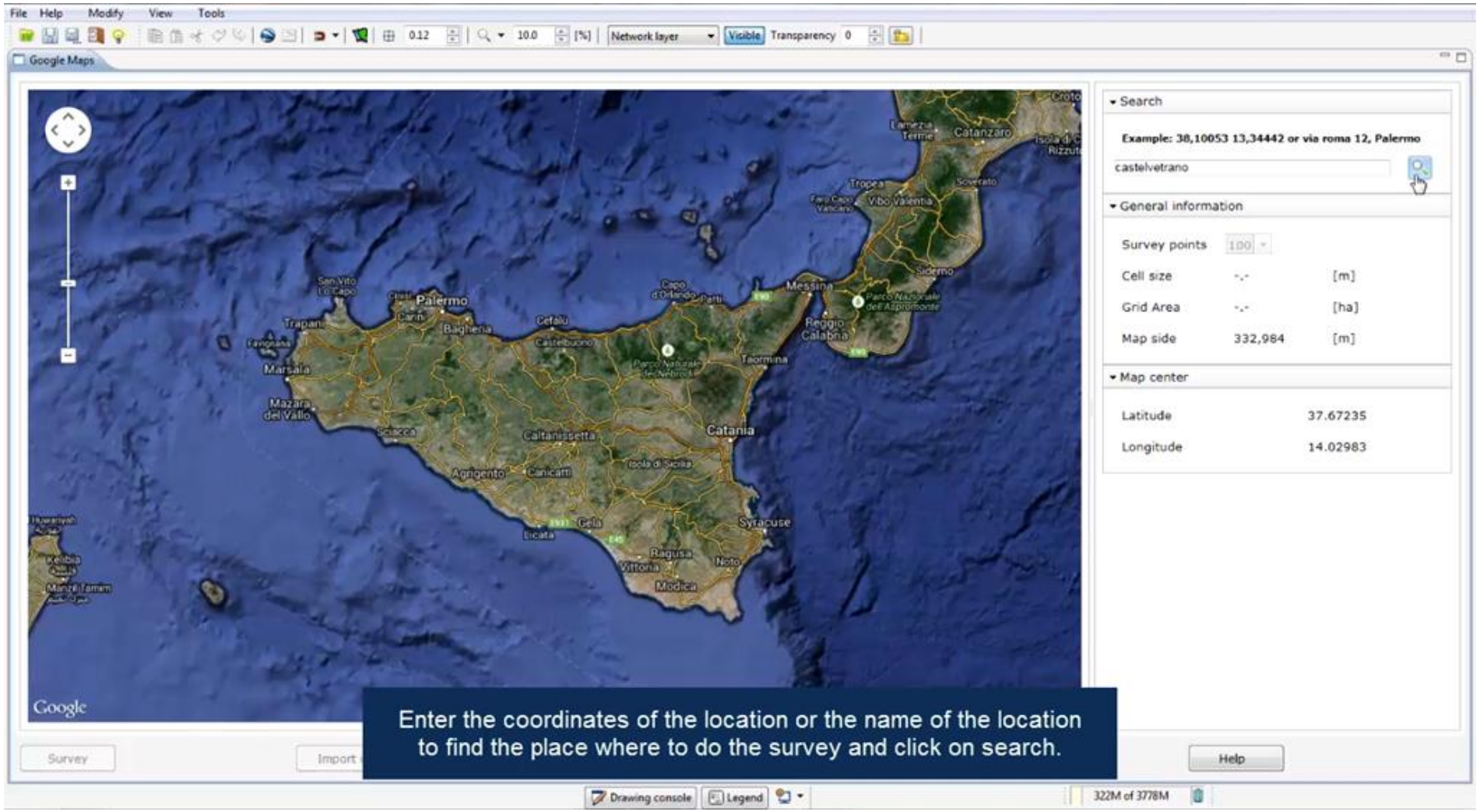
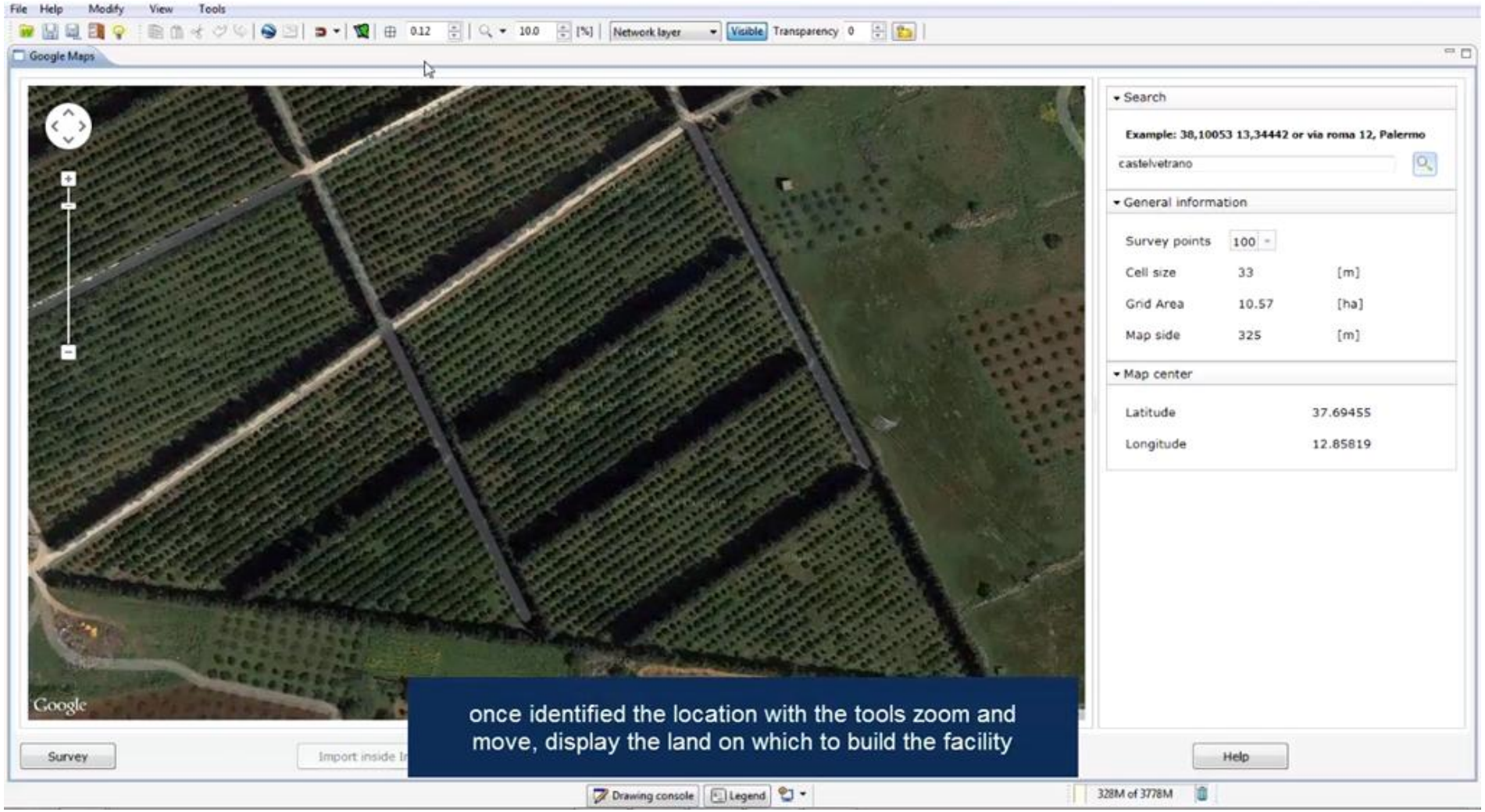
irriworks

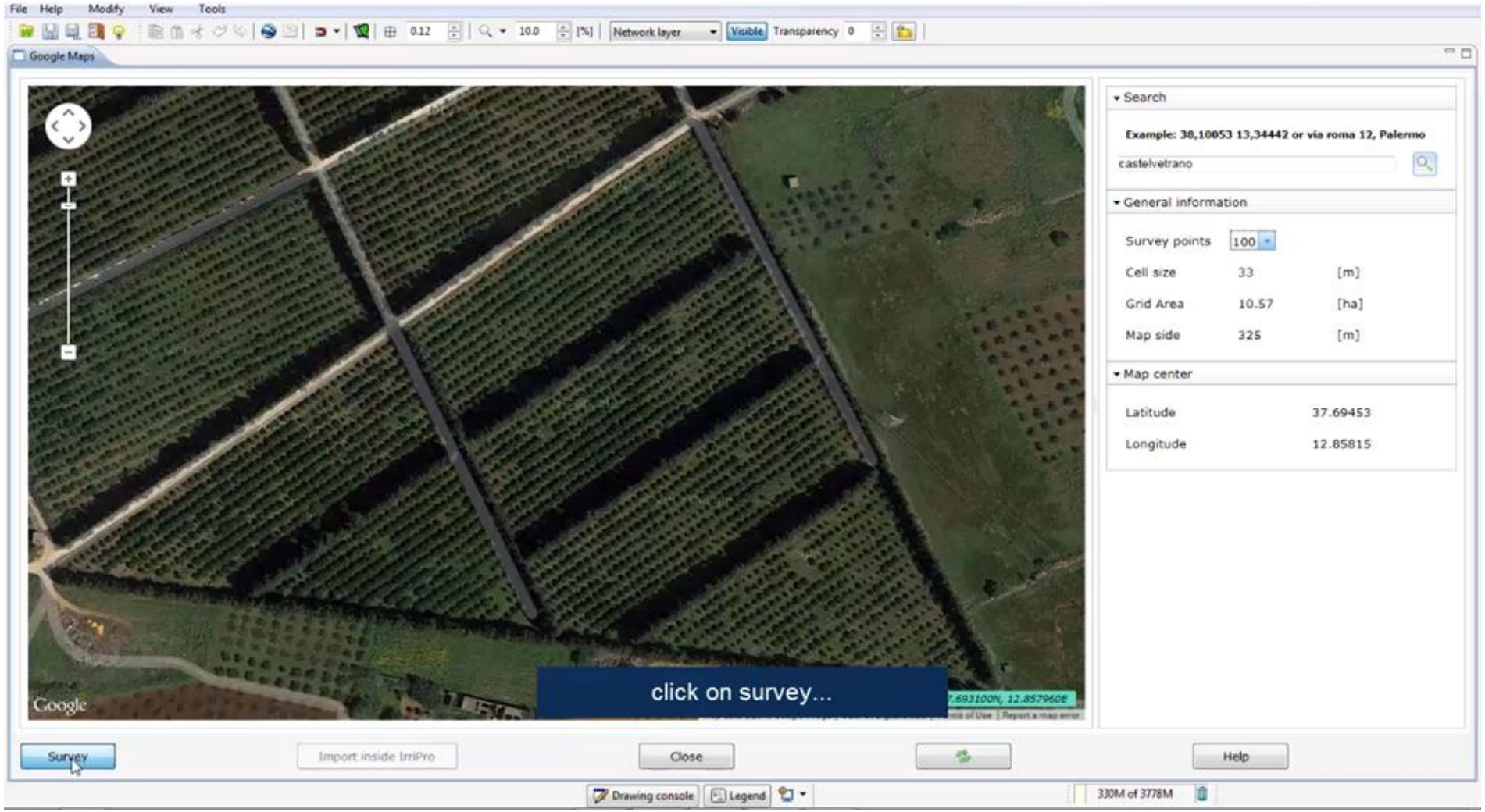
QUICK GUIDE

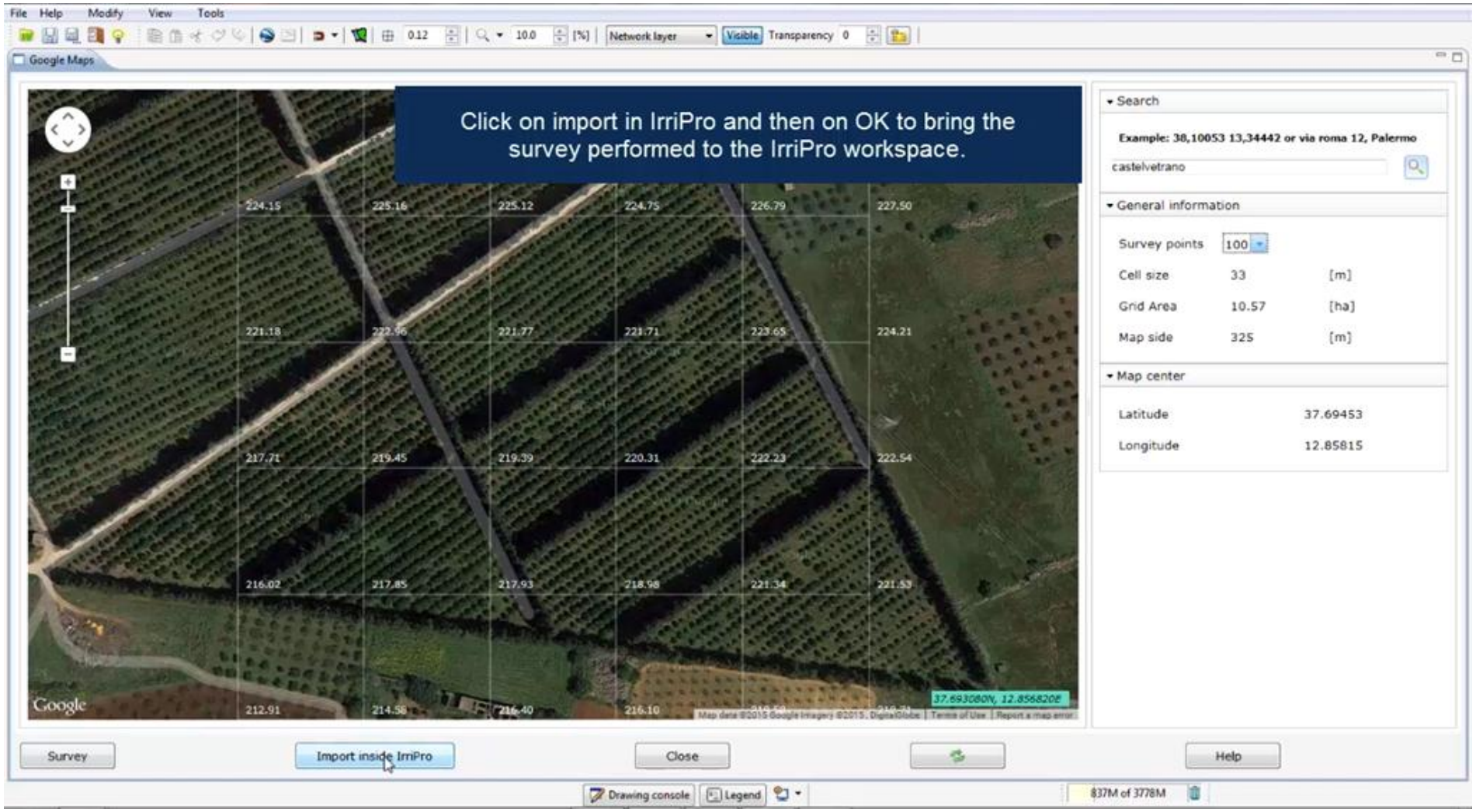

Design for fixed pressur
Pressure
1,000
Discharge
10,000
Emitters and laterals data
Sector #. :
Emitters Type :
Emitters spacing:
Number of rows:
Row spacing:
Emitters
Inline Pipe
Pipe
Secondary
Spread to whole netwo
Advanced
Calculate
In the first selection window, select the design/verification 3 sectors and then click on open wizard.
IRRI PRO
Open File
Design (Assisted - recommended)
Start
Sector No.:
3
Design (Manual - advanced users)
Simplified analysis
International settings
Tutorials online
Cancel
Enable wizard caching

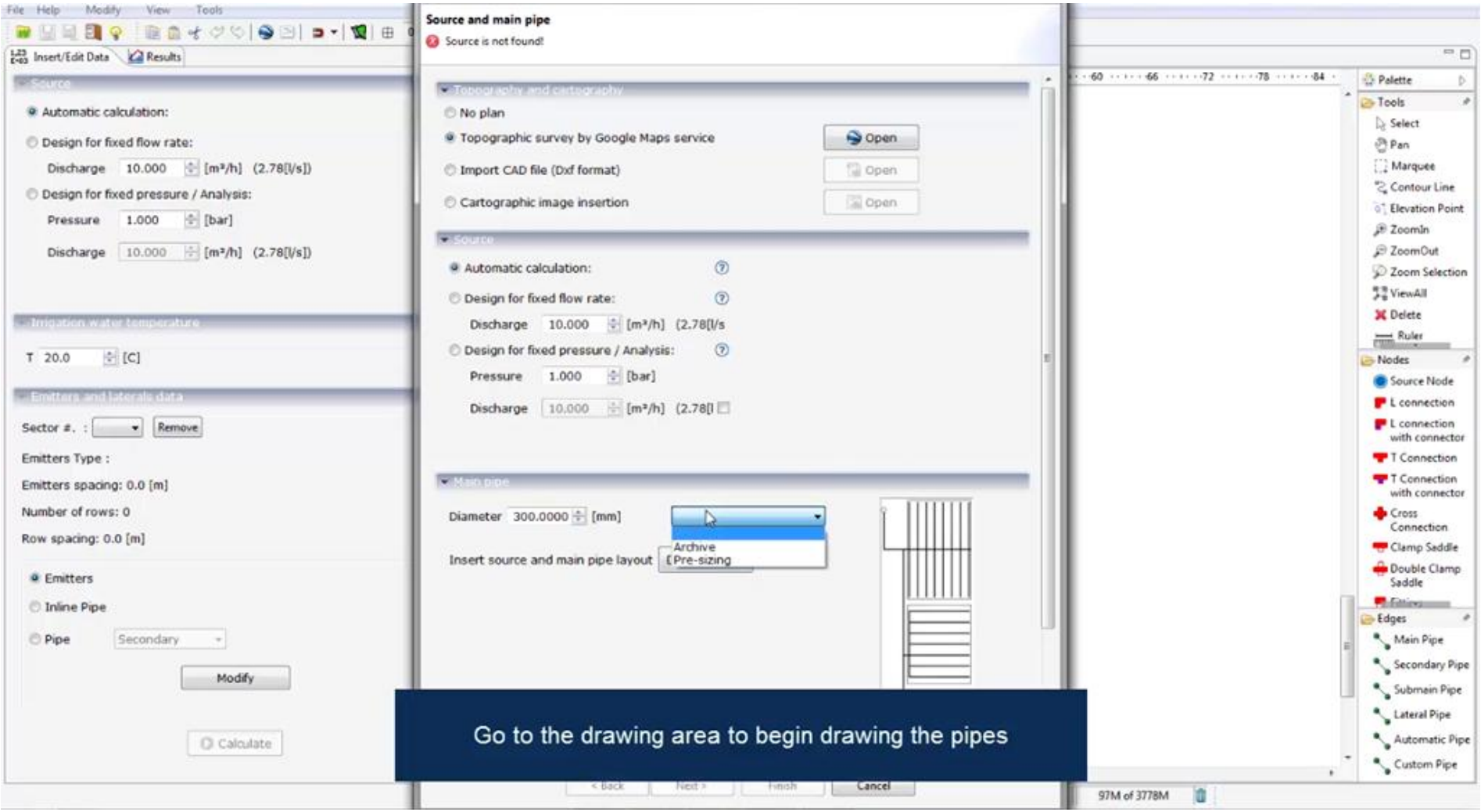

Source and main pipe
Source is not found!
No plan
Topographic survey by Google Maps service
Import CAD file (Dxf format)
Cartographic image insertion
Open
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Diameter 300.0000 [mm]
Insert source and main pipe layout
Drawing area
Cancel
To use Google maps as a mapping support, click survey with Google maps and then click Open

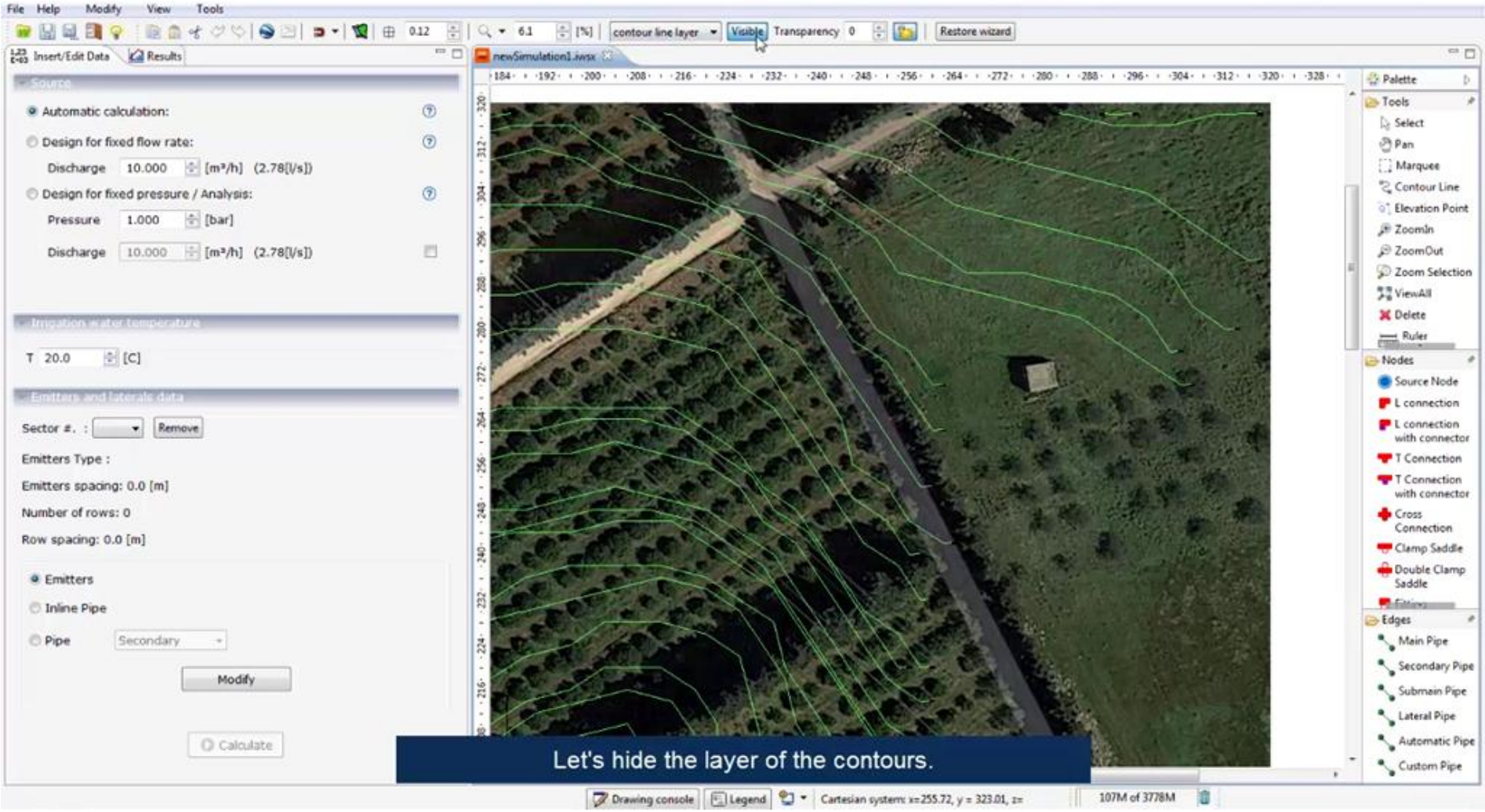

File Help Modify View Tools
Google Maps
Network layer
Visible
Transparency
Search
Example: 38,10053 13,34442 or via roma 12, Palermo
castelvetrano
General information
Survey points
Cell size
Grid Area
Map side
332,984
[m]
[ha]
Map center
Latitude
37.67235
Longitude
14.02983
Palermo
Catania
Messina
Reggio Calabria
Trapani
Marsala
Mazara del Vallo
Caltanissetta
Agrigento
Gela
Ragusa
Syracuse
Modica
Google
Enter the coordinates of the location or the name of the location to find the place where to do the survey and click on search.
Survey
Import
Help
Drawing console
Legend
322M of 3778M

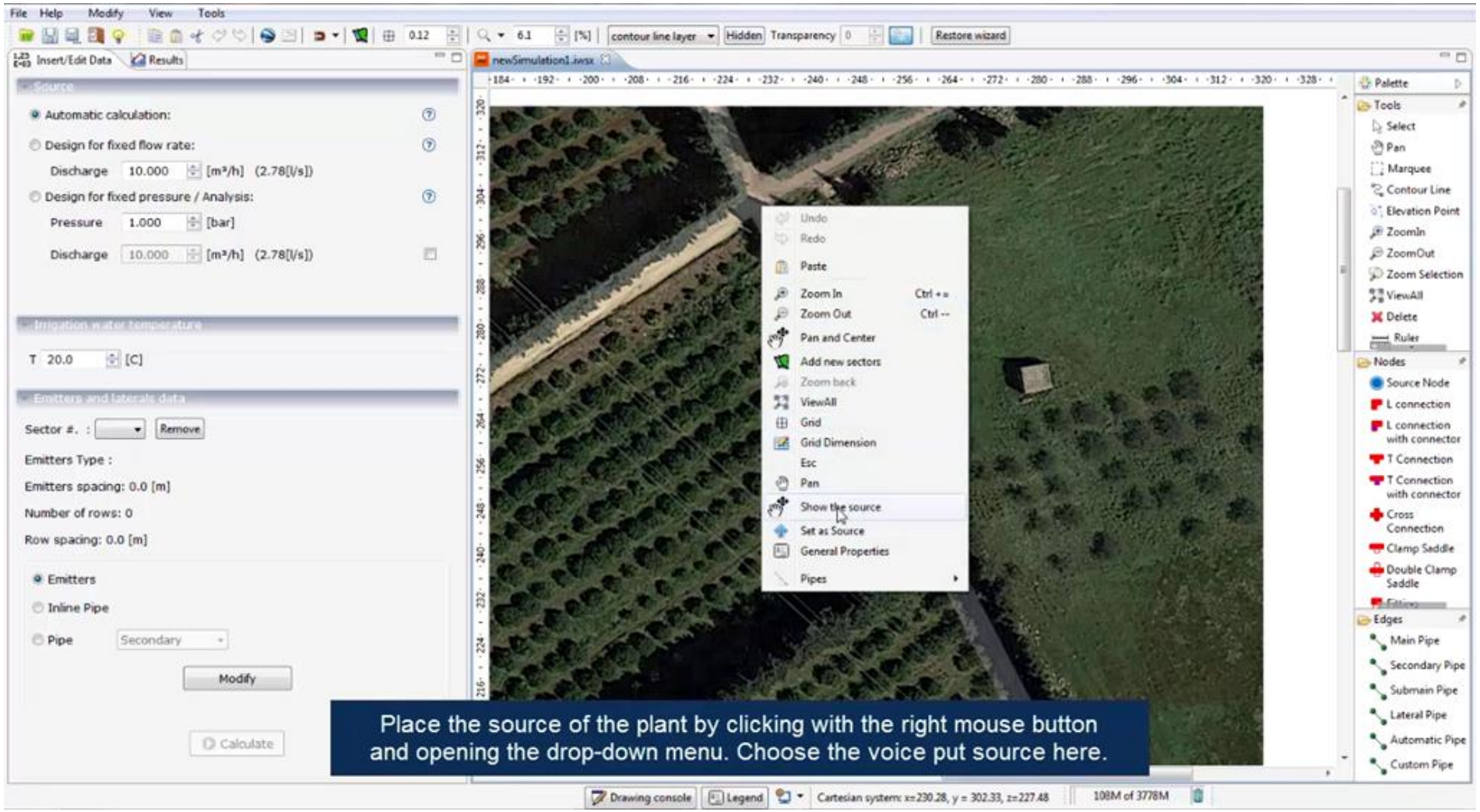

File Help Modify View Tools
Google Maps
Search
Example: 38,10053 13,34442 or via roma 12, Palermo
castelvetrano
General information
Survey points 100
Cell size 33 [m]
Grid Area 10.57 [ha]
Map side 325 [m]
Map center
Latitude 37.69455
Longitude 12.85819
Google
once identified the location with the tools zoom and move, display the land on which to build the facility
Survey
Help
Drawing console
Legend
328M of 3778M


File Help Modify View Tools
Google Maps
Network layer
Visible
Transparency
Search
Example: 38,10053 13,34442 or via roma 12, Palermo
castelvetrano
General information
Survey points 100
Cell size 33 [m]
Grid Area 10.57 [ha]
Map side 325 [m]
Map center
Latitude 37.69453
Longitude 12.85815
click on survey...
Google
Survey
Import inside IrriPro
Close
Help
Drawing console
Legend
330M of 3778M

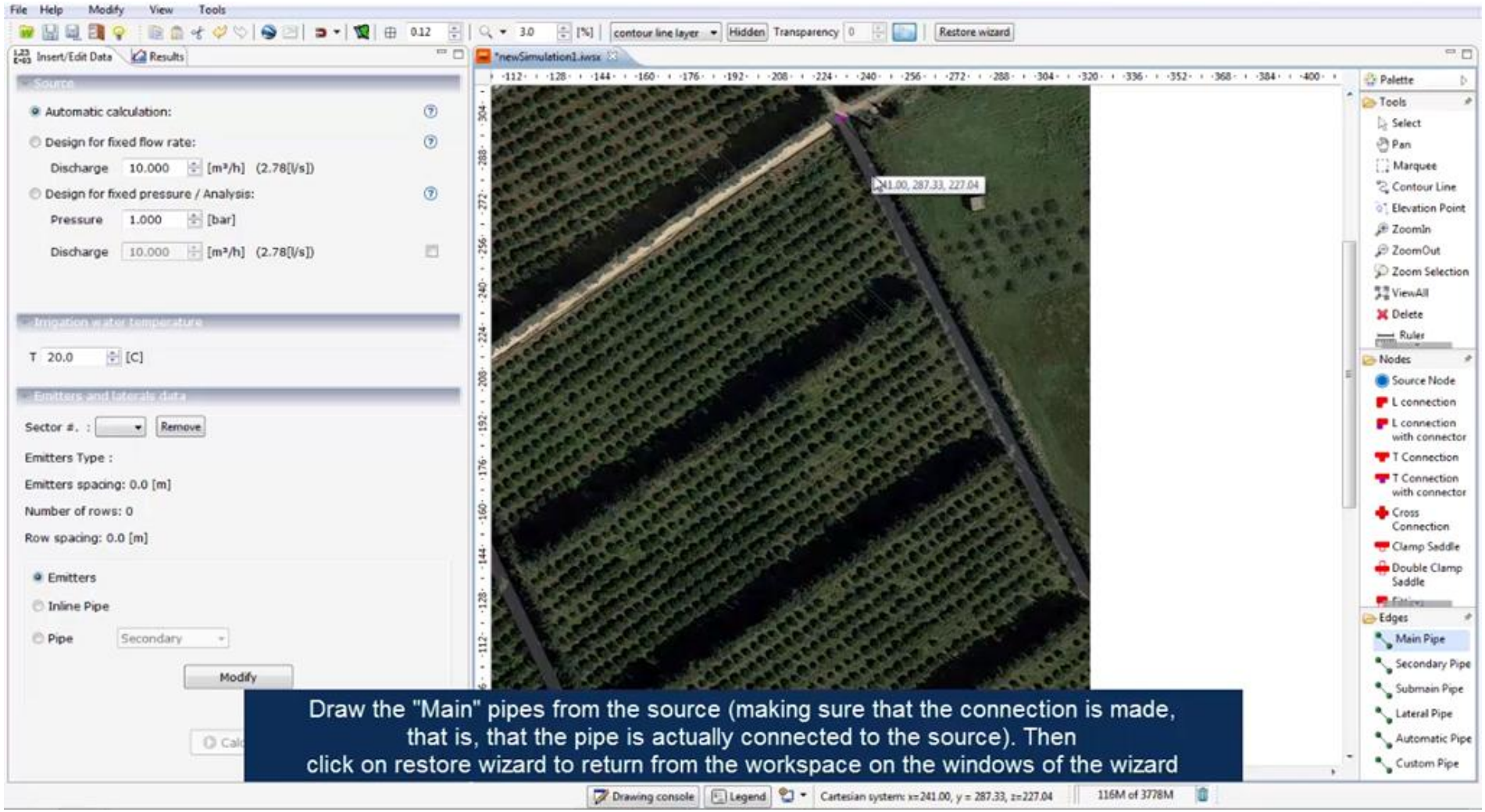

File Help Modify View Tools
Google Maps
Click on import in IrriPro and then on OK to bring the survey performed to the IrriPro workspace.
Search
Example: 38,10053 13,34442 or via roma 12, Palermo
castelvetrano
General information
Survey points 100
Cell size 33 [m]
Grid Area 10.57 [ha]
Map side 325 [m]
Map center
Latitude 37.69453
Longitude 12.85815
Survey
Import inside IrriPro
Close
Help
Drawing console
Legend
837M of 3778M


Source and main pipe
Source is not found!
Topography and cartography
No plan
Topographic survey by Google Maps service
Open
Import CAD file (Dxf format)
Open
Cartographic image insertion
Open
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l
Main pipe
Diameter 300.0000 [mm]
Insert source and main pipe layout
Archive
Pre-sizing
Go to the drawing area to begin drawing the pipes
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
Insert/Edit Data
Results
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
97M of 3778M

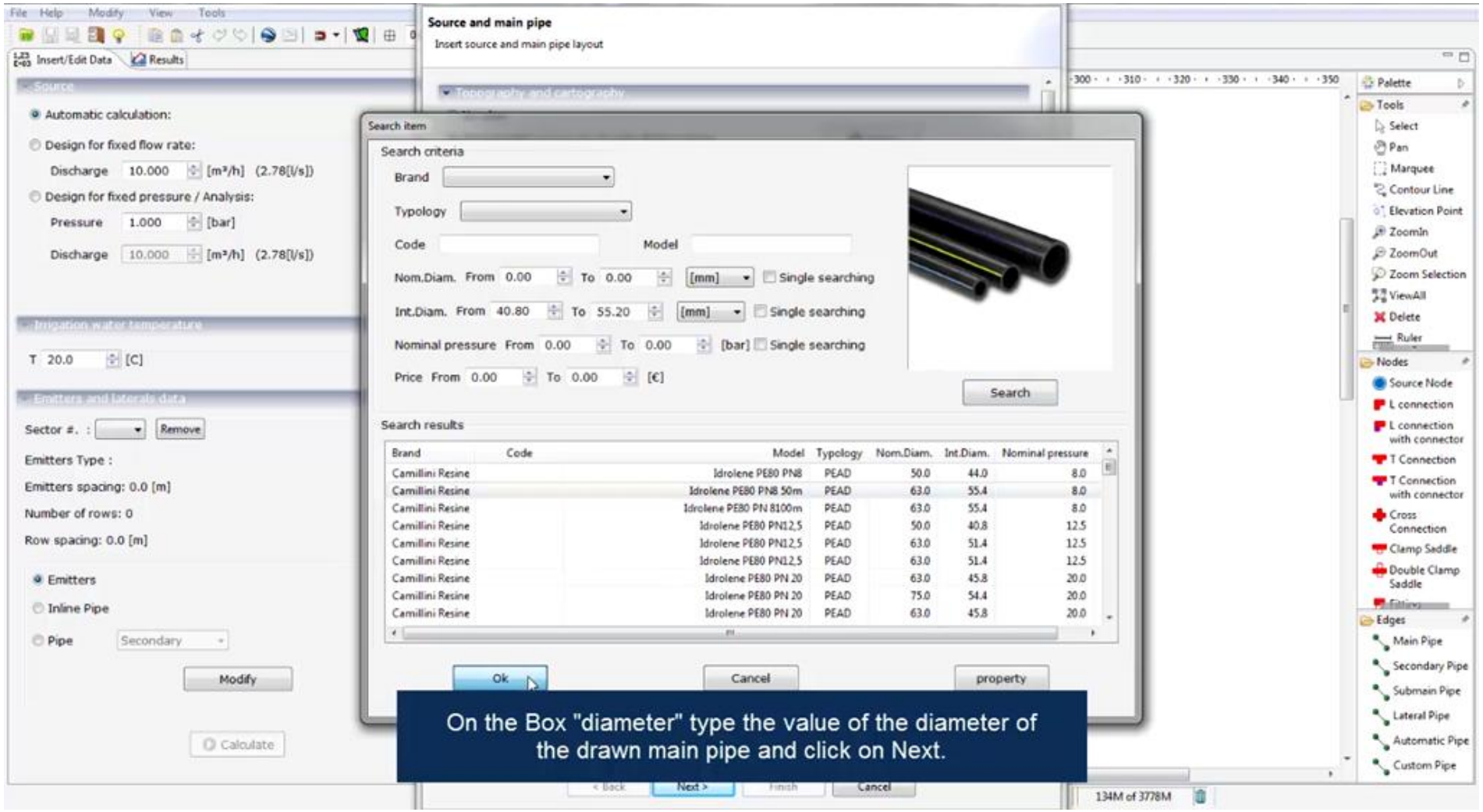

File Help Modify View Tools
contour line layer
Visible
Transparency
Restore wizard
Insert/Edit Data
Results
newSimulation1.iwsx
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
Let's hide the layer of the contours.
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
Drawing console
Legend
Cartesian system: x=255.72, y = 323.01, z=
107M of 3778M



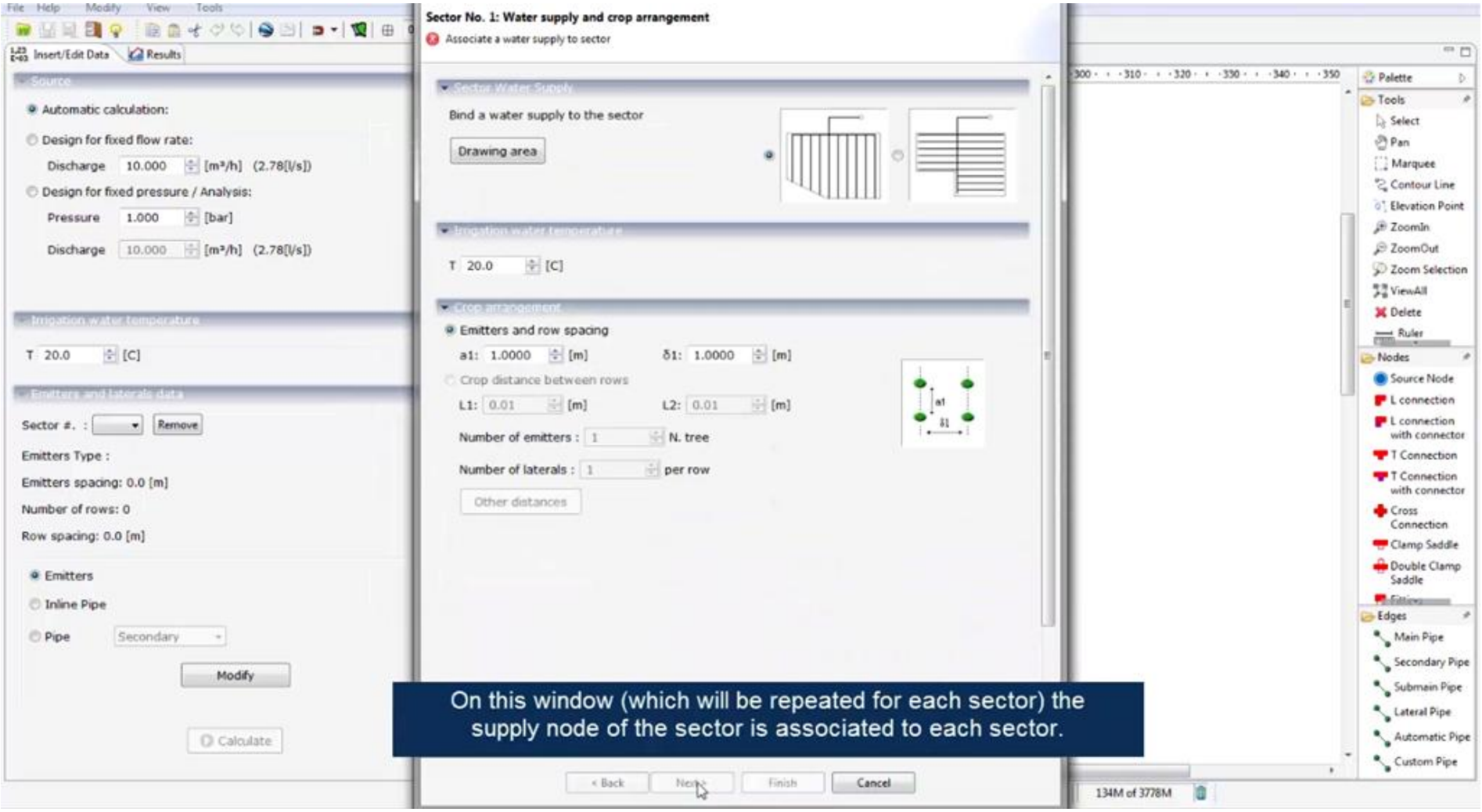
Place the source of the plant by clicking with the right mouse button and opening the drop-down menu. Choose the voice put source here.



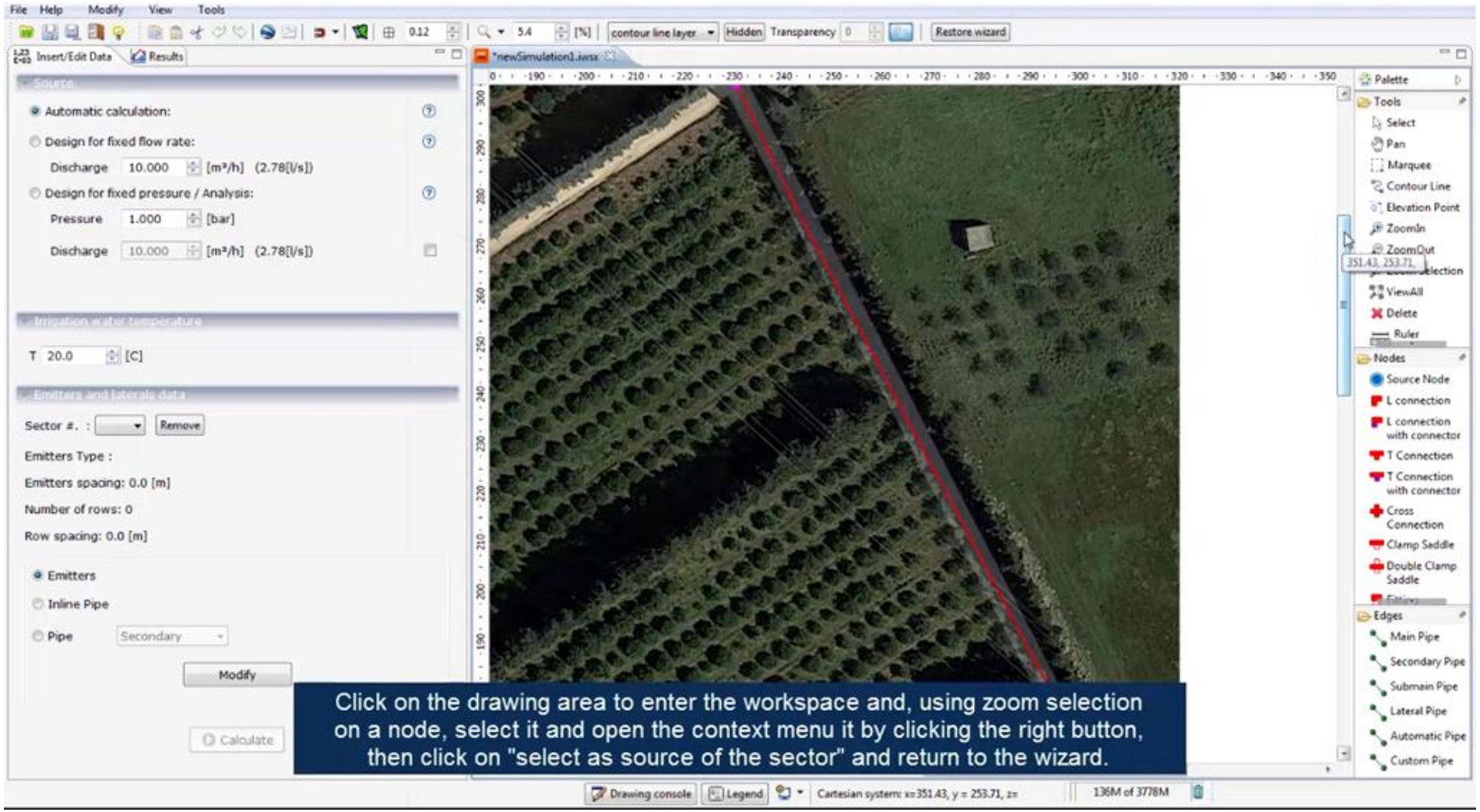
Draw the "Main" pipes from the source (making sure that the connection is made, that is, that the pipe is actually connected to the source). Then click on restore wizard to return from the workspace on the windows of the wizard



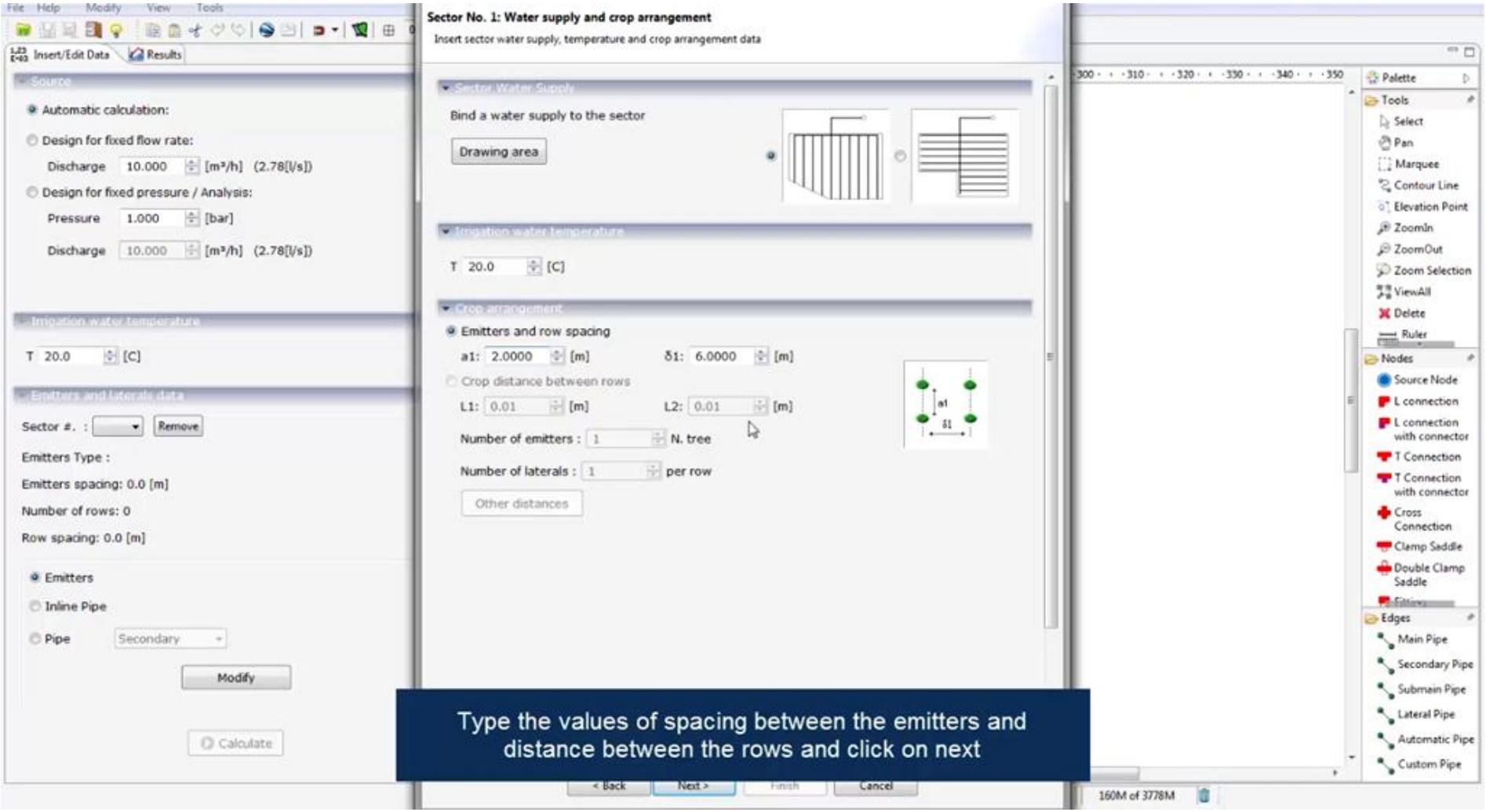
On the Box "diameter" type the value of the diameter of the drawn main pipe and click on Next.



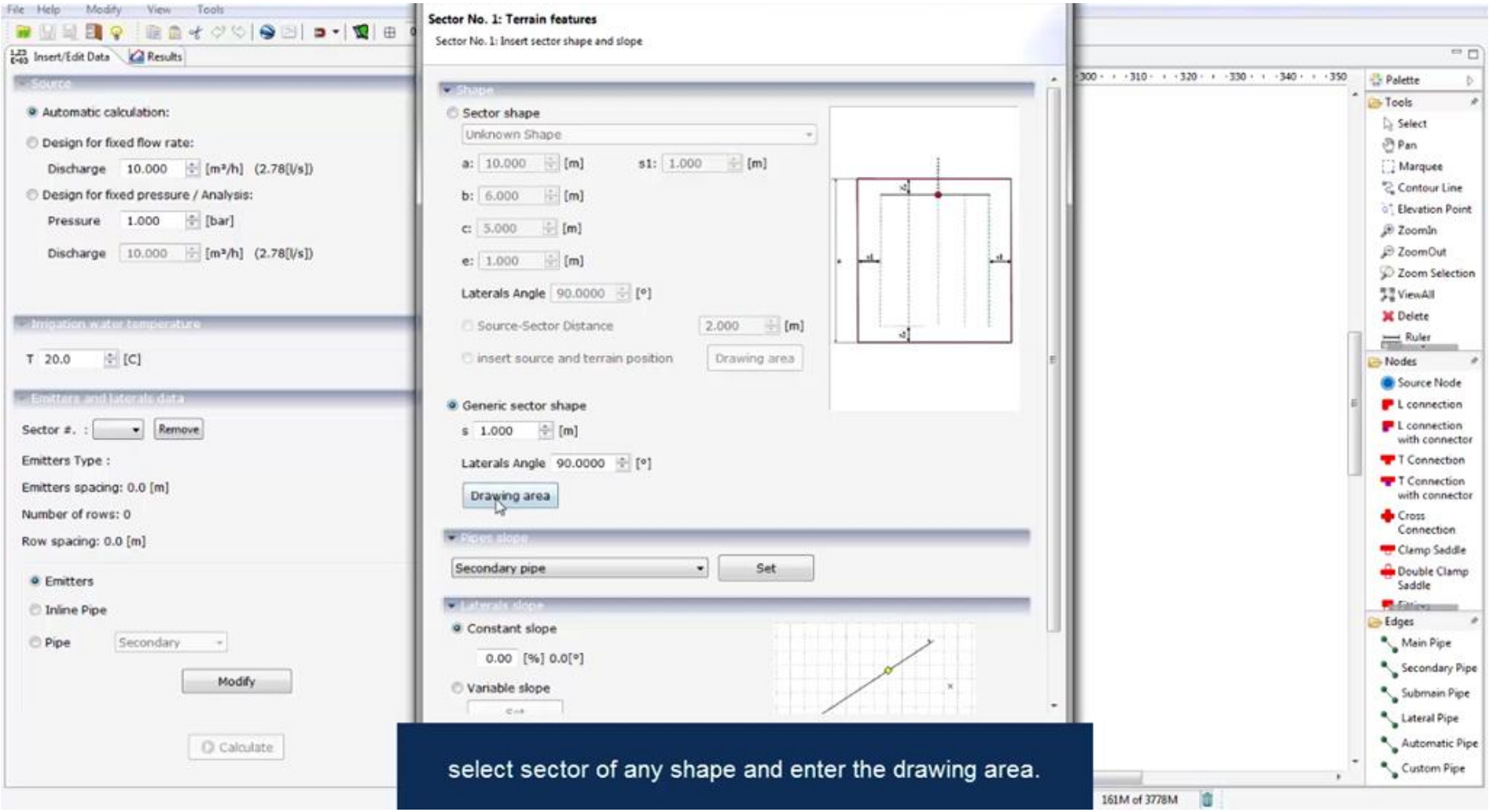
On this window (which will be repeated for each sector) the supply node of the sector is associated to each sector.



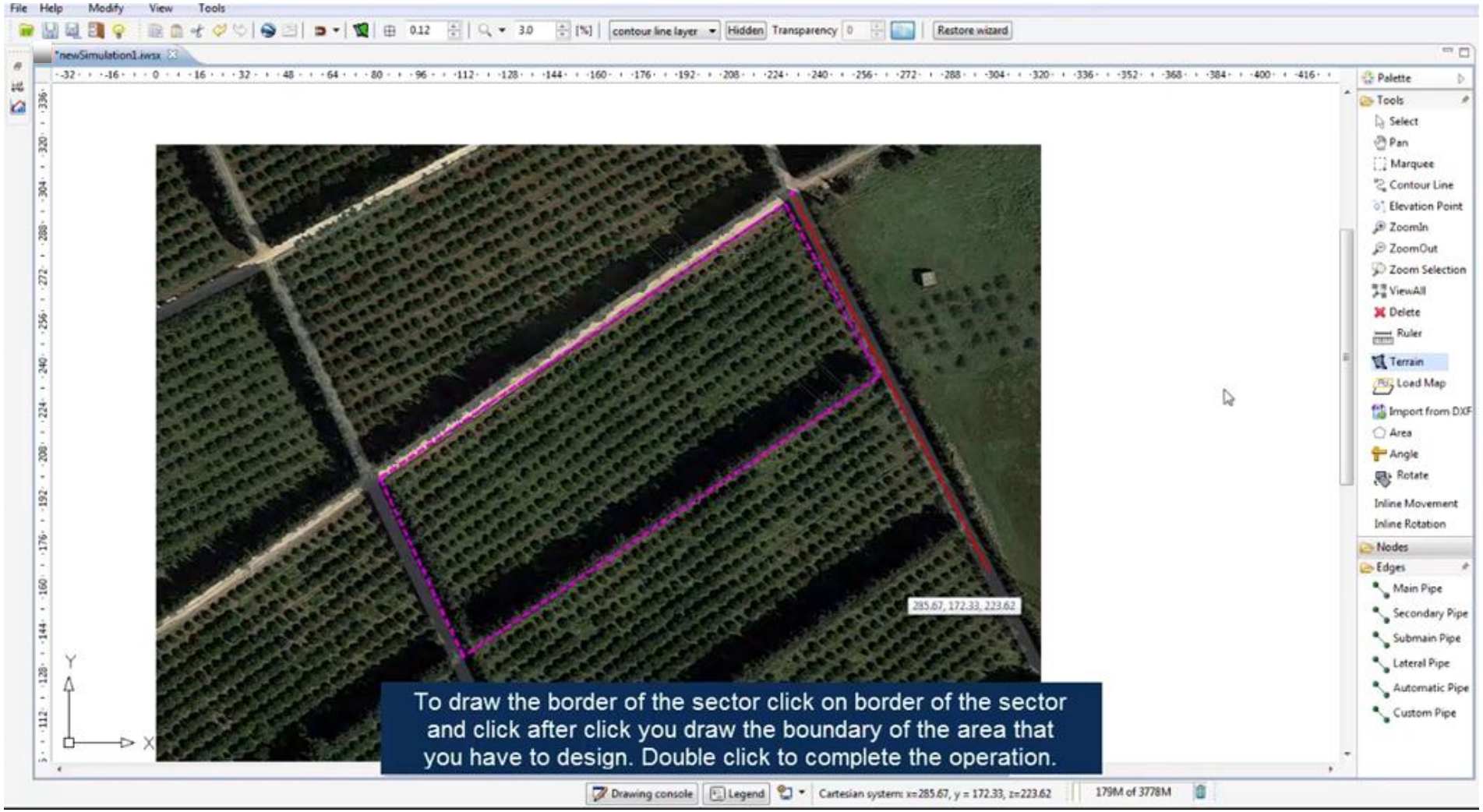
Click on the drawing area to enter the workspace and, using zoom selection on a node, select it and open the context menu it by clicking the right button, then click on "select as source of the sector" and return to the wizard.

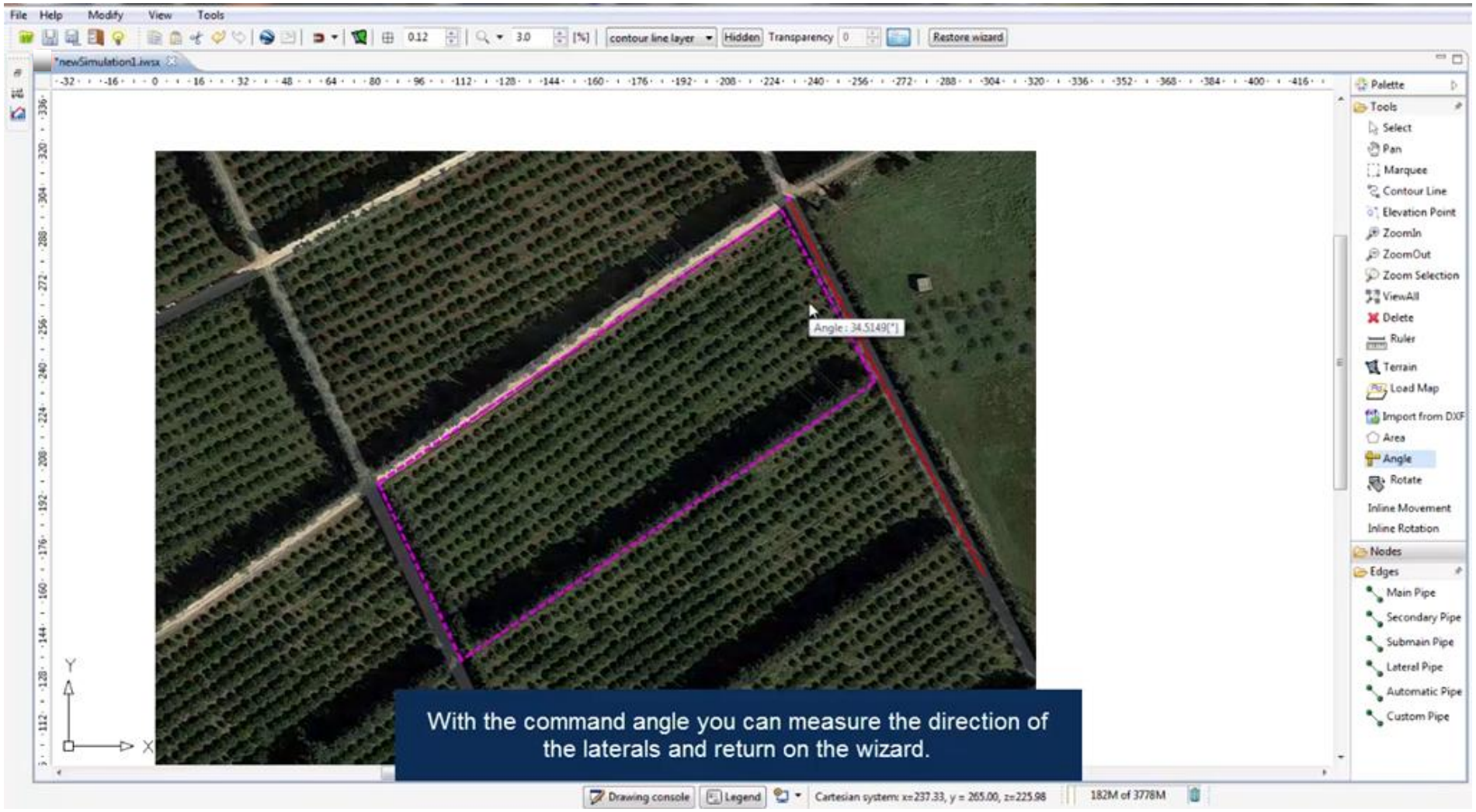


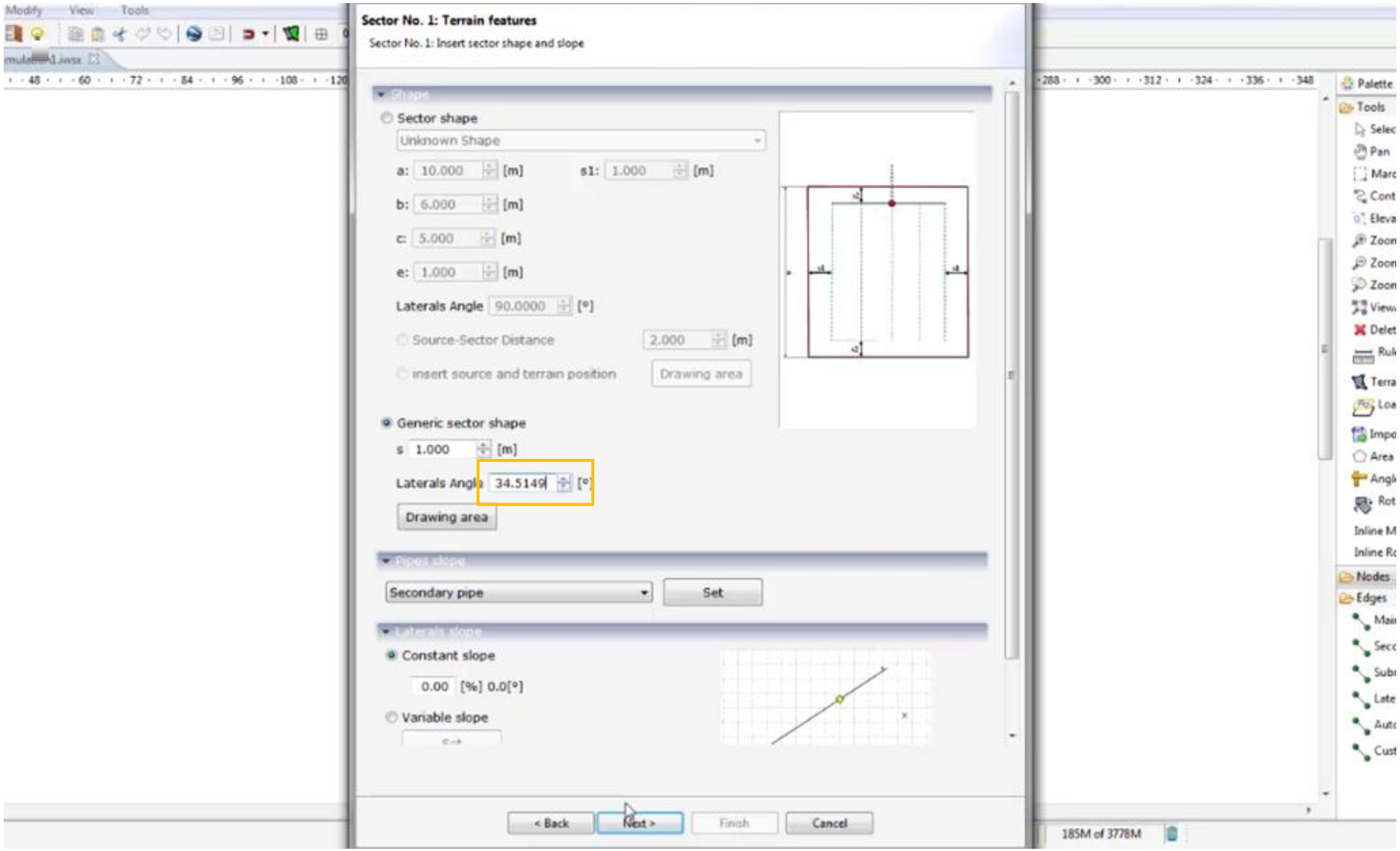
Type the values of spacing between the emitters and distance between the rows and click on next

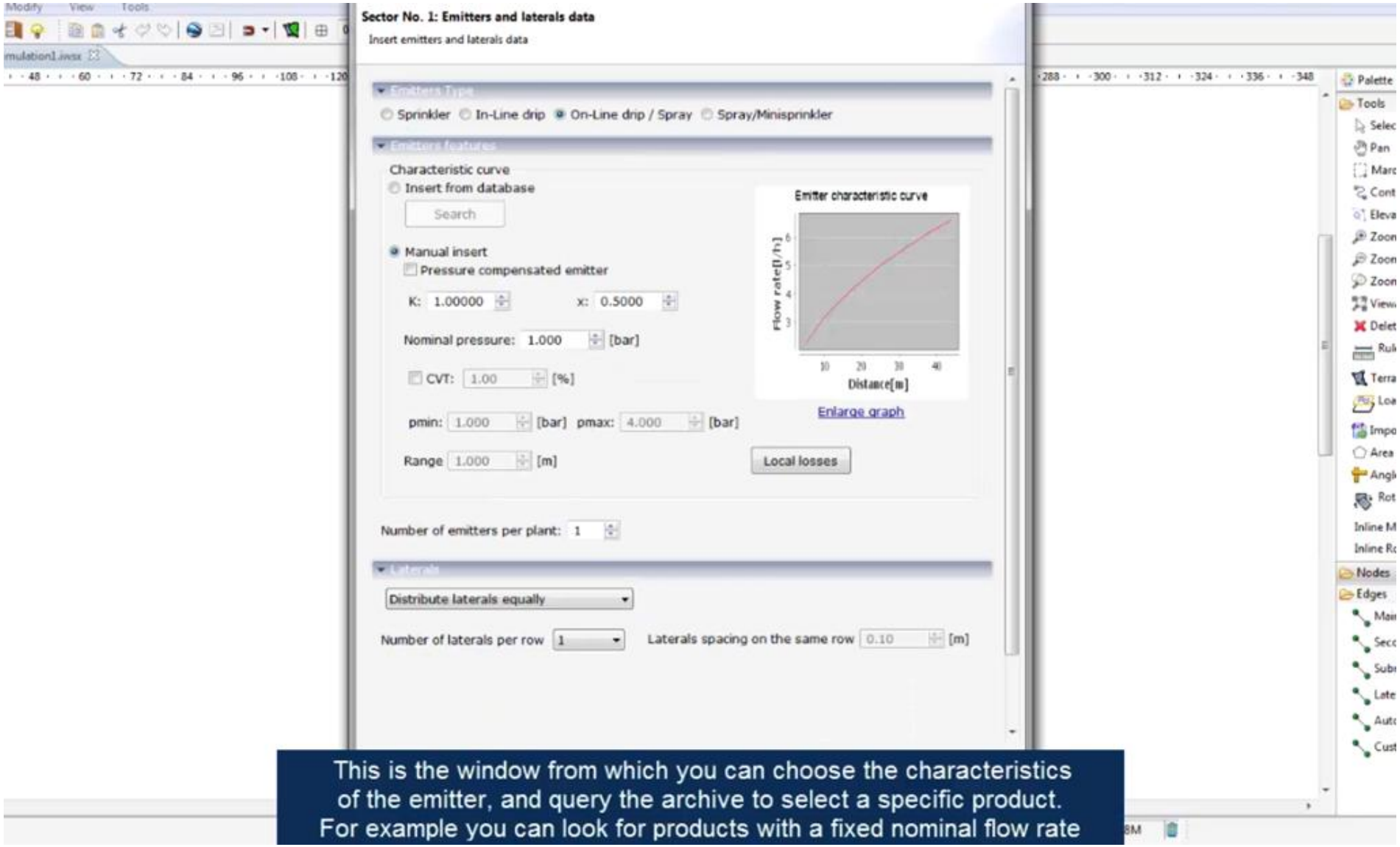


select sector of any shape and enter the drawing area.

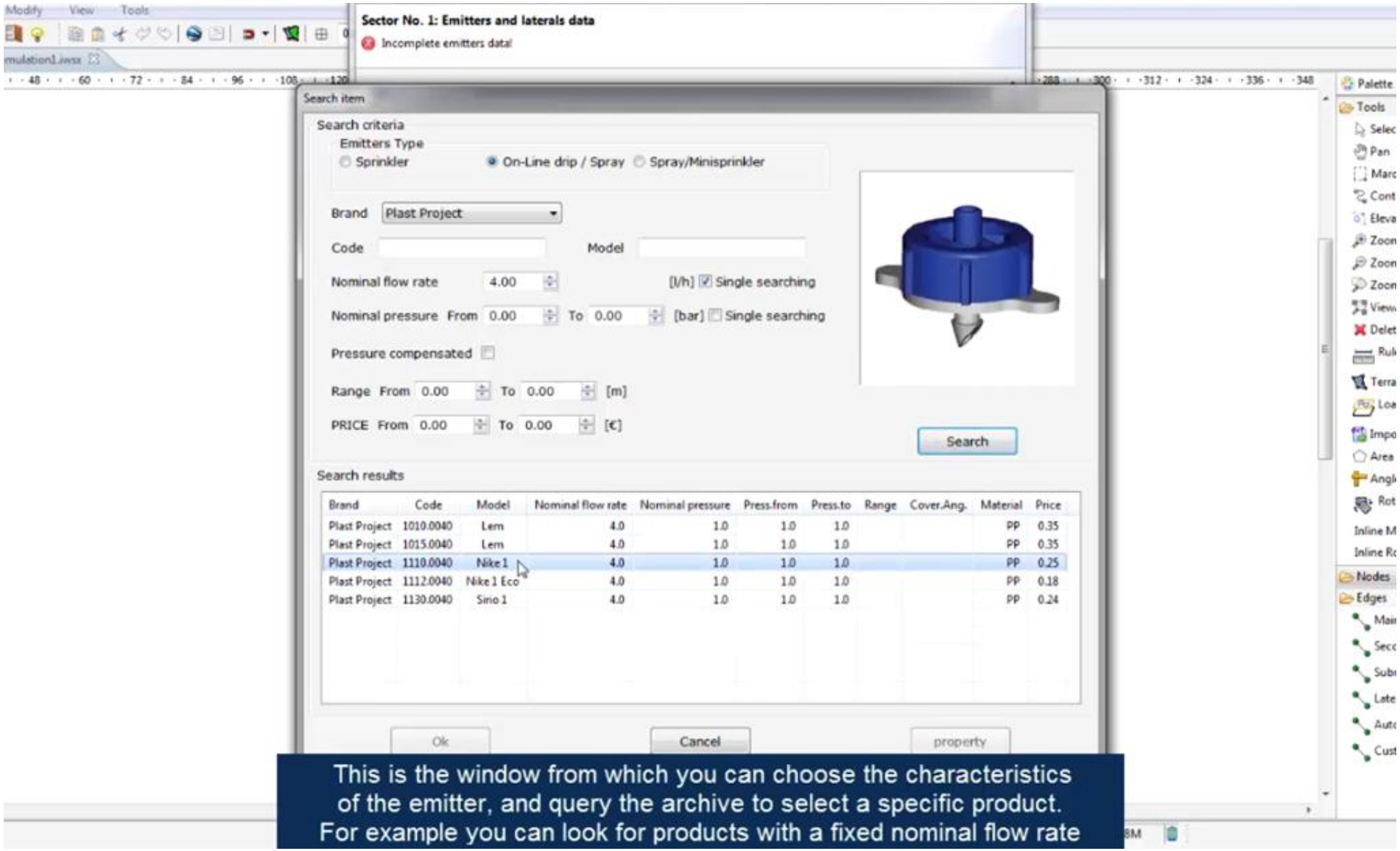

File Help Modify View Tools
contour line layer
Hidden
Transparency
Restore wizard
*newSimulation1.iwsx
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Terrain
Load Map
Import from DXF
Area
Angle
Rotate
Inline Movement
Inline Rotation
Nodes
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
285.67, 172.33, 223.62
To draw the border of the sector click on border of the sector and click after click you draw the boundary of the area that you have to design. Double click to complete the operation.
Drawing console
Legend
Cartesian system: x=285.67, y = 172.33, z=223.62
179M of 3778M


File
Help
Modify
View
Tools
contour line layer
Hidden
Transparency
Restore wizard
*newSimulation1.iwsx
Angle : 34.5149(°)
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Terrain
Load Map
Import from DXF
Area
Angle
Rotate
Inline Movement
Inline Rotation
Nodes
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
Y
X
With the command angle you can measure the direction of the laterals and return on the wizard.
Drawing console
Legend
Cartesian system: x=237.33, y = 265.00, z=225.98
182M of 3778M


Modify View Tools
Sector No. 1: Terrain features
Sector No. 1: Insert sector shape and slope
Shape
Sector shape
Unknown Shape
a: 10.000 [m]
s1: 1.000 [m]
b: 6.000 [m]
c: 5.000 [m]
e: 1.000 [m]
Laterals Angle 90.0000 [°]
Source-Sector Distance 2.000 [m]
insert source and terrain position
Drawing area
Generic sector shape
s 1.000 [m]
Laterals Angle 34.5149 [°]
Drawing area
Pipes slope
Secondary pipe
Set
Laterals slope
Constant slope
0.00 [%] 0.0[°]
Variable slope
< Back
Next >
Finish
Cancel
Palette
Tools
Nodes
Edges
185M of 3778M



This is the window from which you can choose the characteristics of the emitter, and query the archive to select a specific product. For example you can look for products with a fixed nominal flow rate



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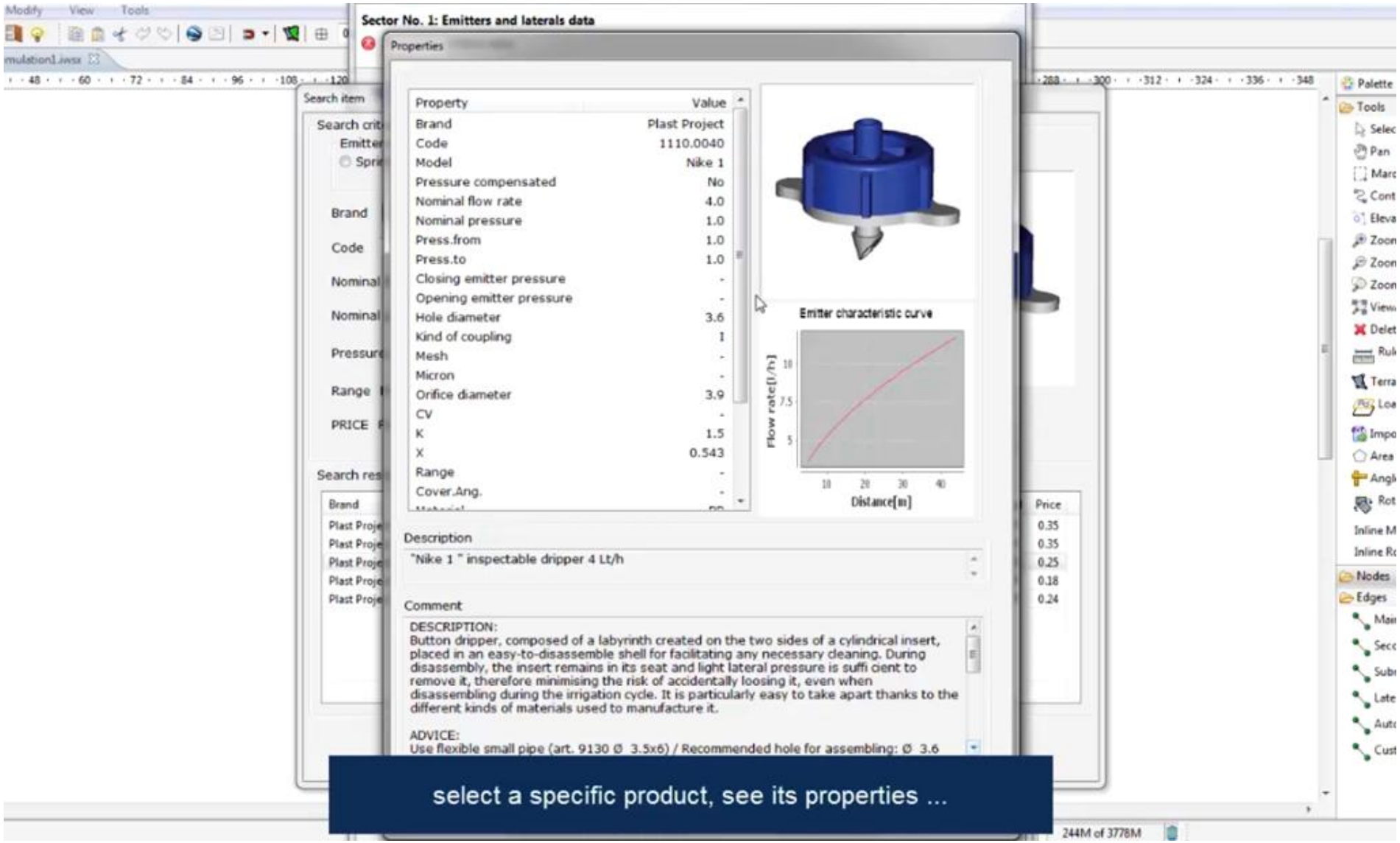
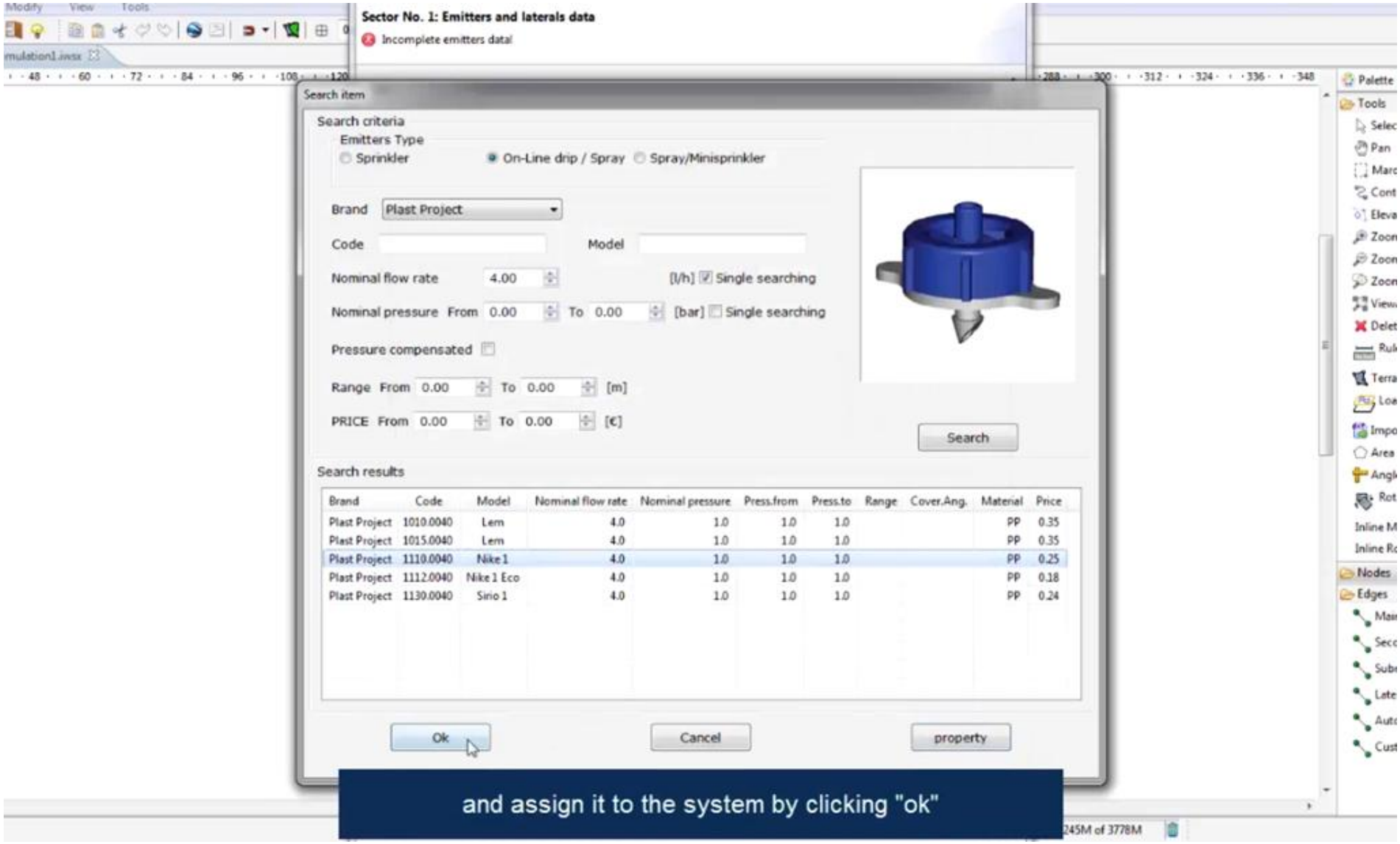
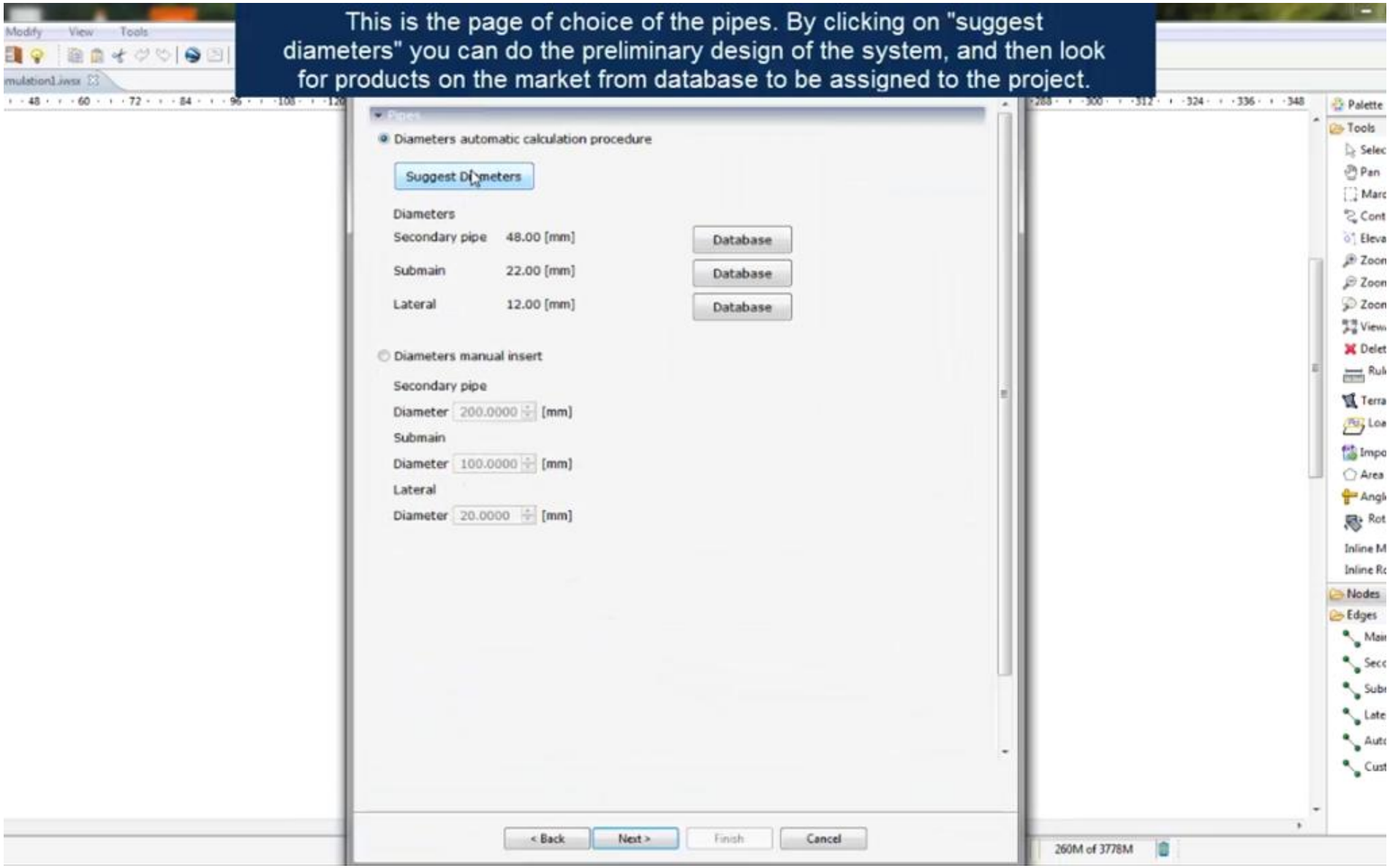


select a specific product, see its properties ...


Sector No. 1: Emitters and laterals data
Incomplete emitters data!
Search item
Search criteria
Emitters Type
Sprinkler
On-Line drip / Spray
Spray/Minisprinkler
Brand
Plast Project
Code
Model
Nominal flow rate
4.00
[l/h]
Single searching
Nominal pressure From 0.00 To 0.00 [bar]
Single searching
Pressure compensated
Range From 0.00 To 0.00 [m]
PRICE From 0.00 To 0.00 [€]
Search
Search results
Brand Code Model Nominal flow rate Nominal pressure Press.from Press.to Range Cover.Ang. Material Price
Plast Project 1010.0040 Lem 4.0 1.0 1.0 1.0 PP 0.35
Plast Project 1015.0040 Lem 4.0 1.0 1.0 1.0 PP 0.35
Plast Project 1110.0040 Nike 1 4.0 1.0 1.0 1.0 PP 0.25
Plast Project 1112.0040 Nike 1 Eco 4.0 1.0 1.0 1.0 PP 0.18
Plast Project 1130.0040 Sirio 1 4.0 1.0 1.0 1.0 PP 0.24
Ok
Cancel
property
and assign it to the system by clicking "ok"

This is the page of choice of the pipes. By clicking on "suggest diameters" you can do the preliminary design of the system, and then look for products on the market from database to be assigned to the project.



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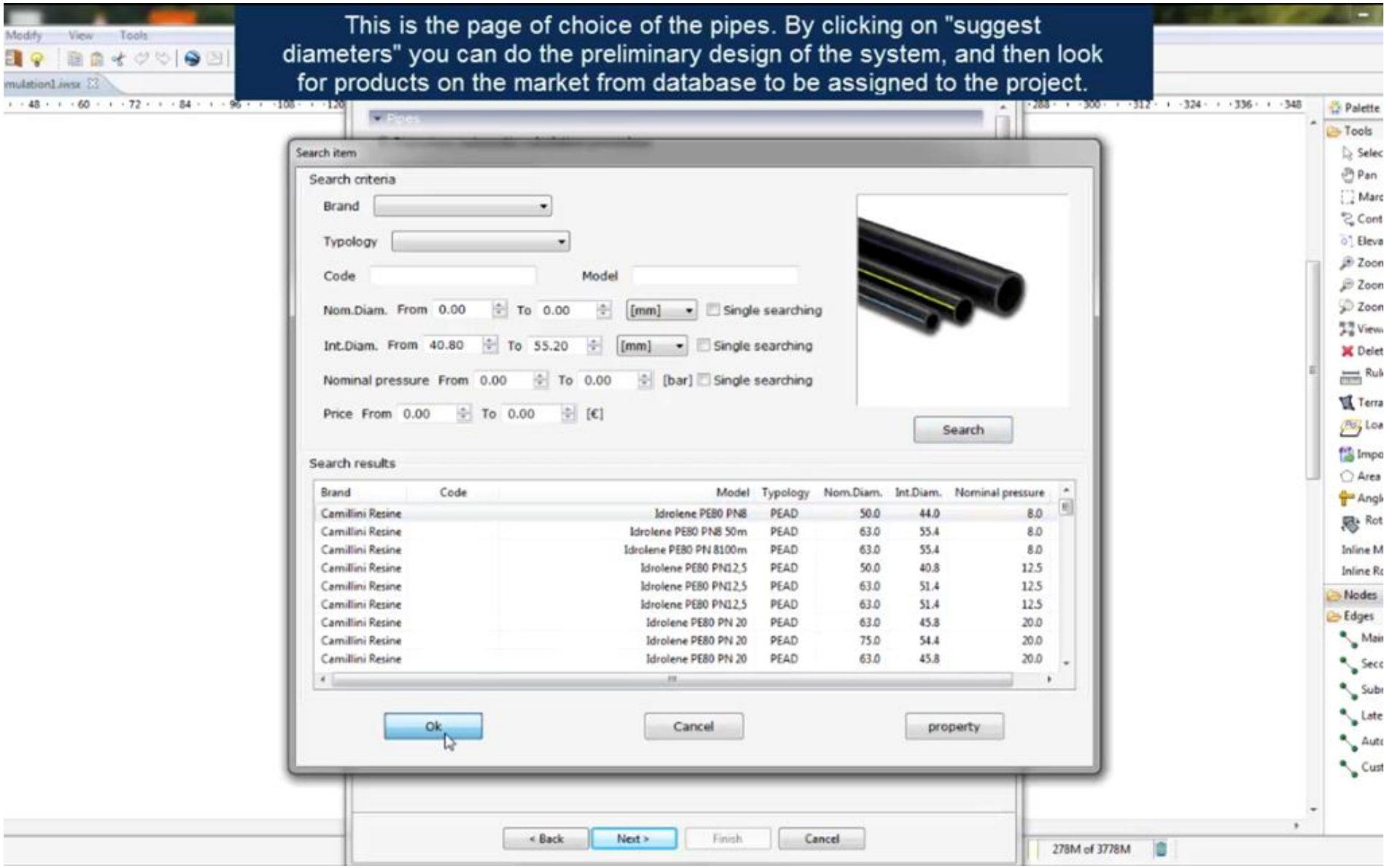
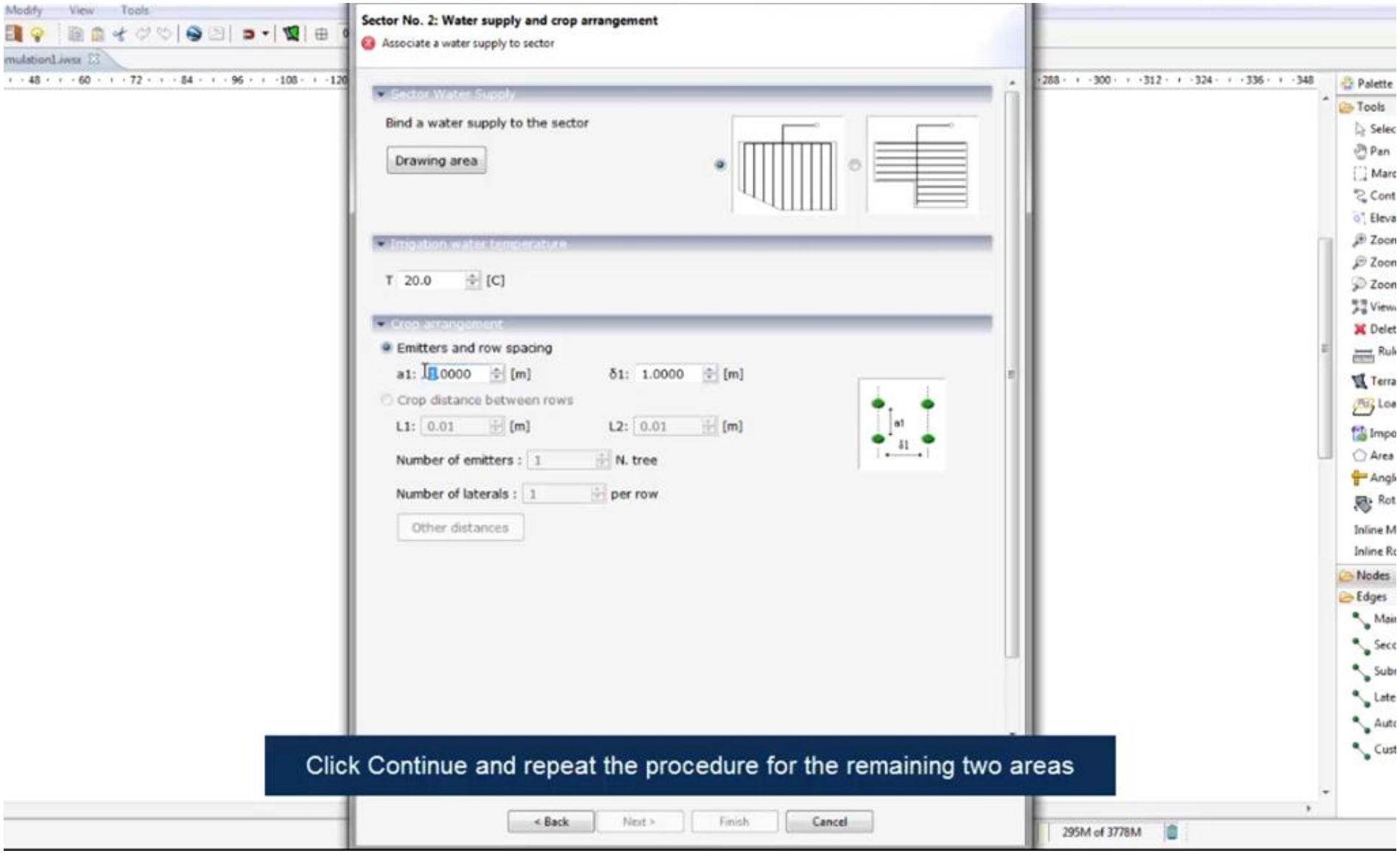
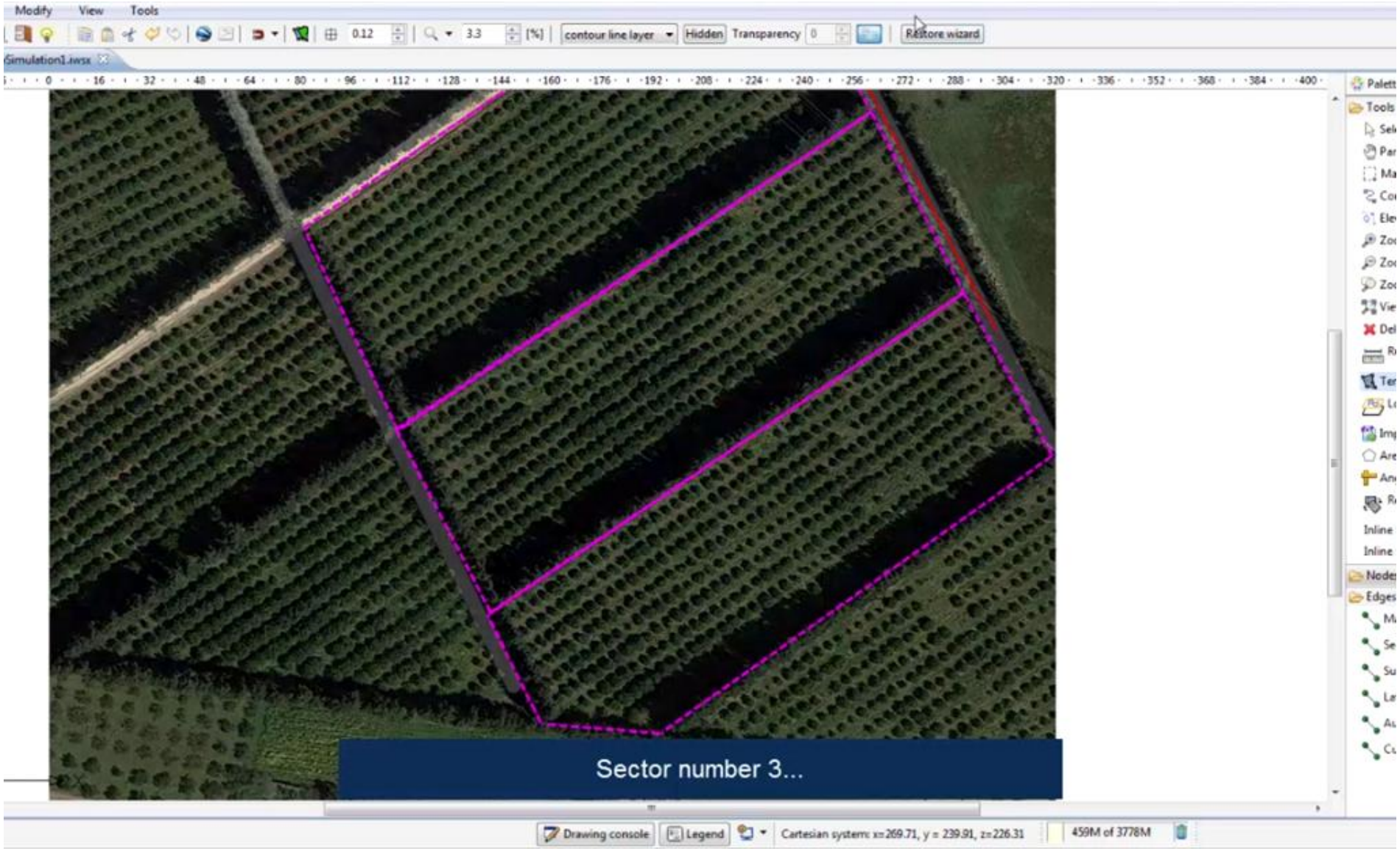
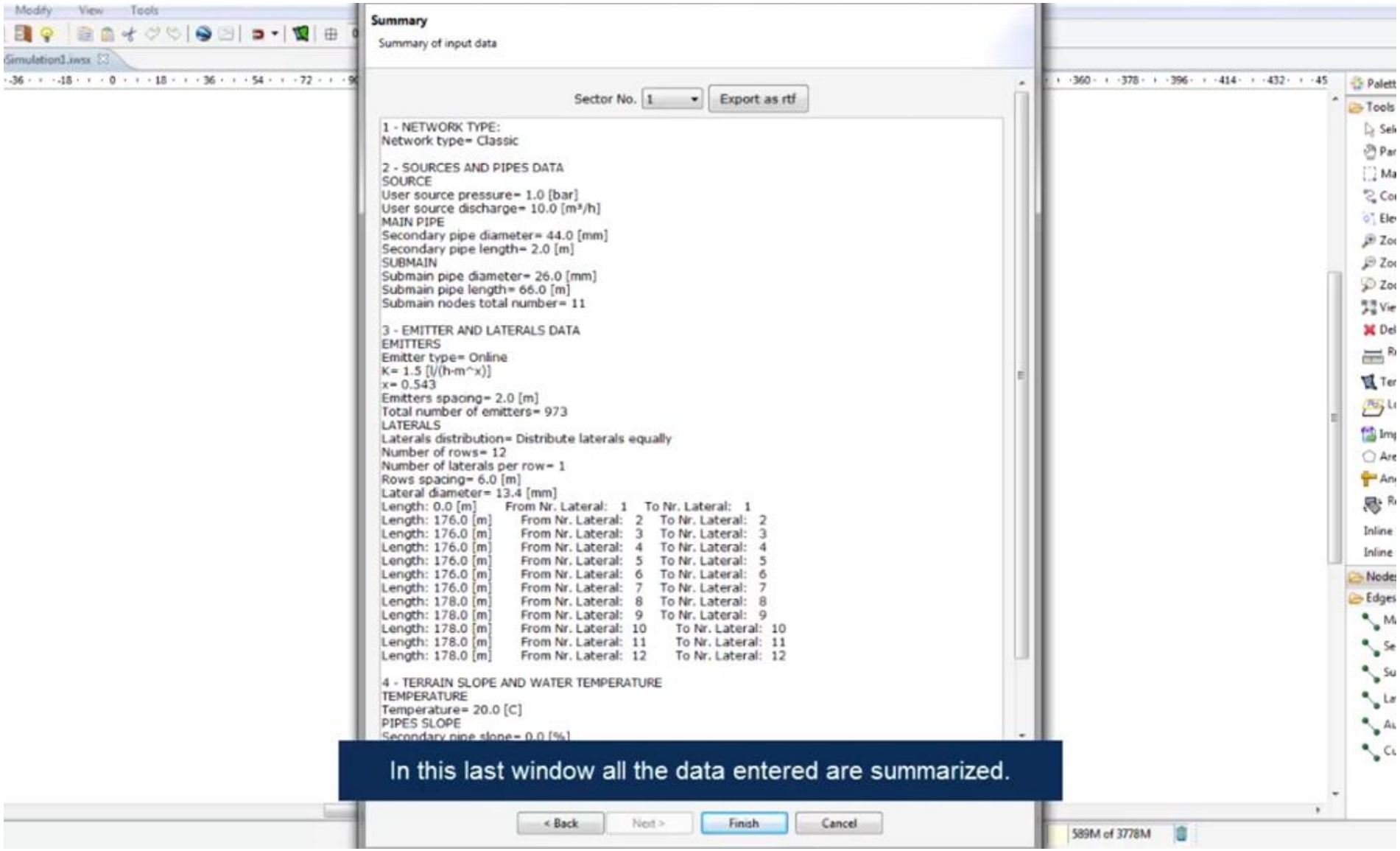
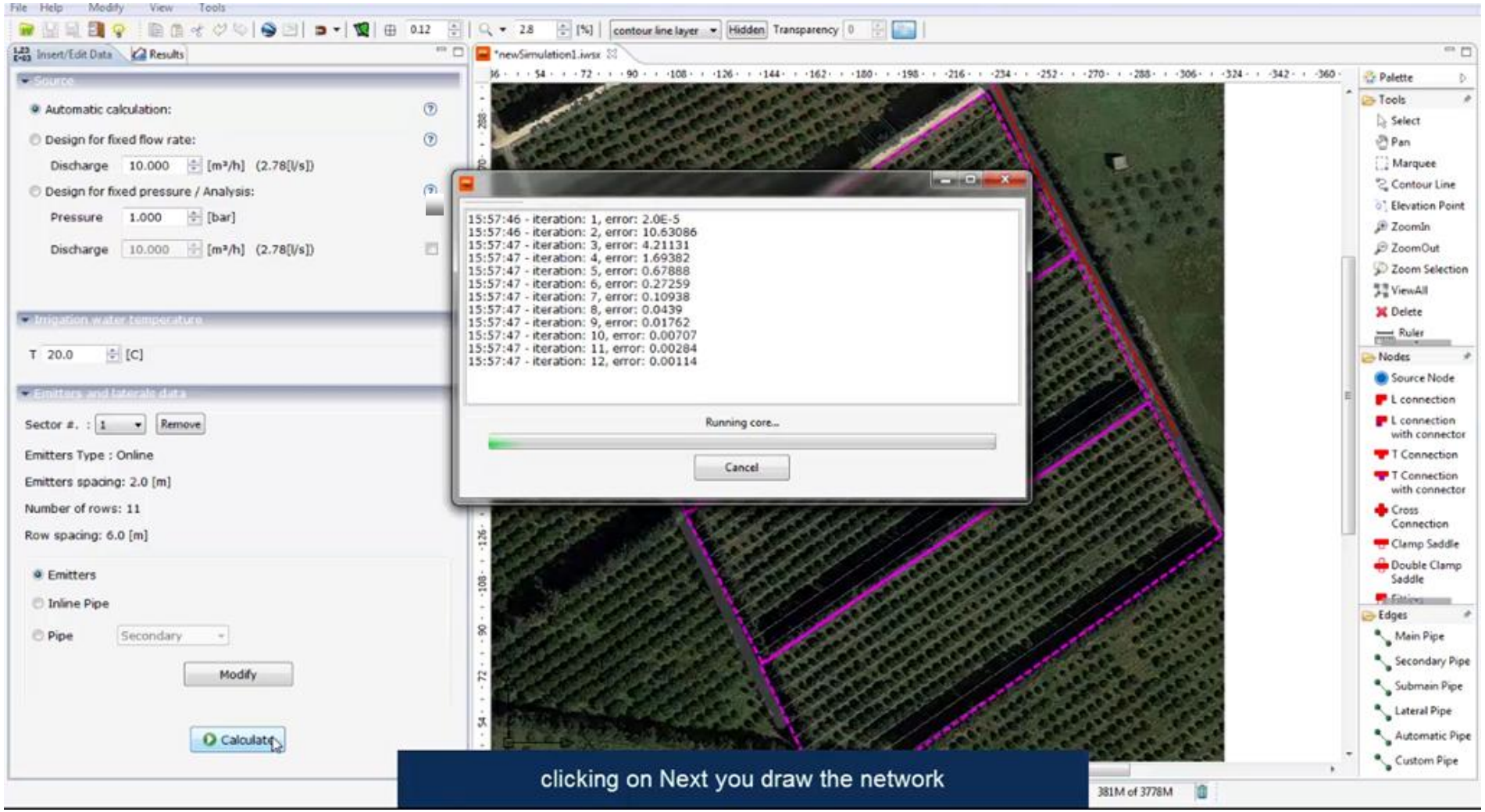




Click Continue and repeat the procedure for the remaining two areas

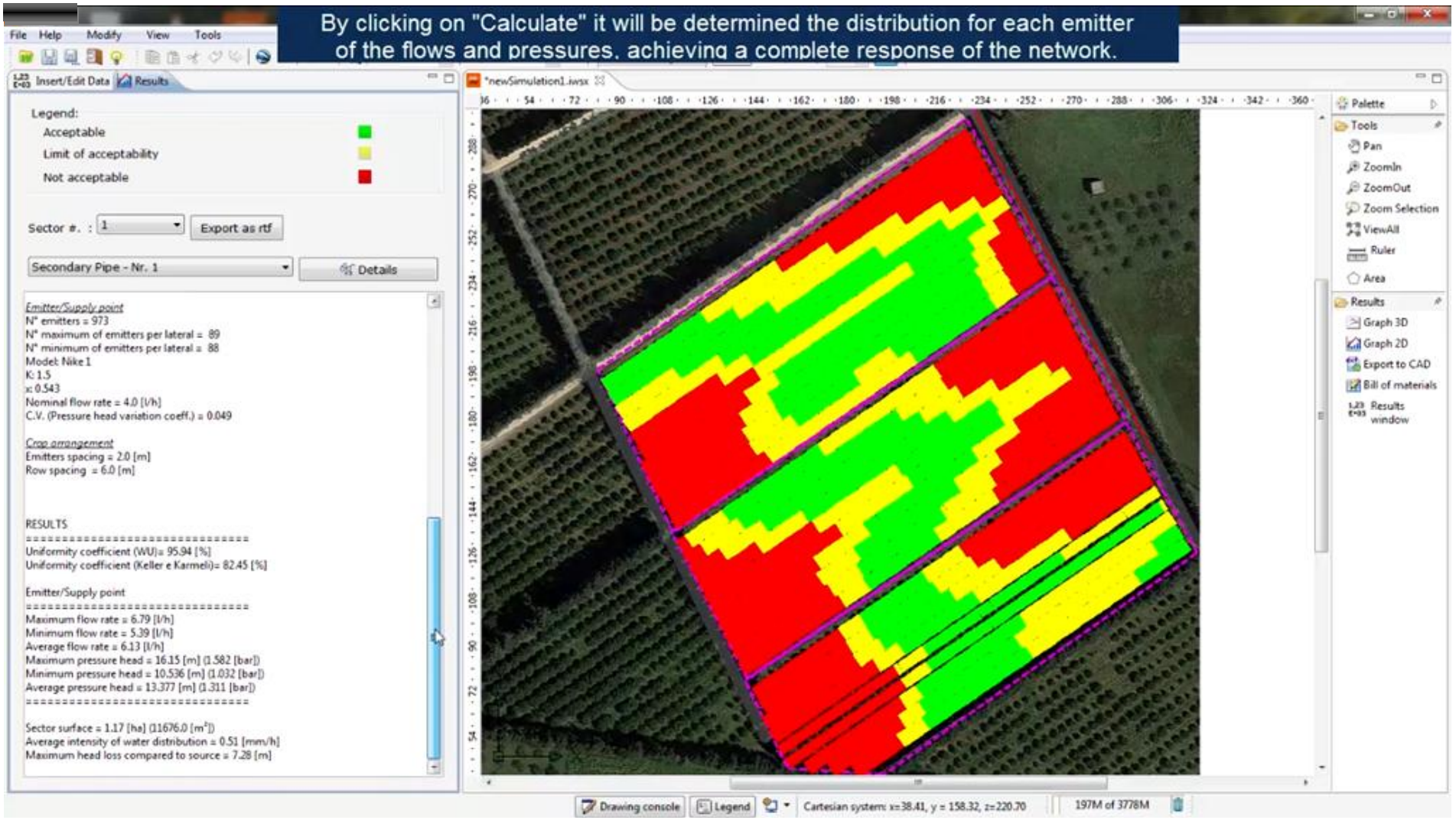

Modify
View
Tools
contour line layer
Hidden
Transparency
Restore wizard
Sector number 3...
Drawing console
Legend
Cartesian system: x=269.71, y = 239.91, z=226.31
459M of 3778M


Summary
Summary of input data
Sector No. 1
Export as rtf
1 - NETWORK TYPE:
Network type= Classic
2 - SOURCES AND PIPES DATA
SOURCE
User source pressure= 1.0 [bar]
User source discharge= 10.0 [m³/h]
MAIN PIPE
Secondary pipe diameter= 44.0 [mm]
Secondary pipe length= 2.0 [m]
SUBMAIN
Submain pipe diameter= 26.0 [mm]
Submain pipe length= 66.0 [m]
Submain nodes total number= 11
3 - EMITTER AND LATERALS DATA
EMITTERS
Emitter type= Online
K= 1.5 [l/(h·m^x)]
x= 0.543
Emitters spacing= 2.0 [m]
Total number of emitters= 973
LATERALS
Laterals distribution= Distribute laterals equally
Number of rows= 12
Number of laterals per row= 1
Rows spacing= 6.0 [m]
Lateral diameter= 13.4 [mm]
Length: 0.0 [m] From Nr. Lateral: 1 To Nr. Lateral: 1
Length: 176.0 [m] From Nr. Lateral: 2 To Nr. Lateral: 2
Length: 176.0 [m] From Nr. Lateral: 3 To Nr. Lateral: 3
Length: 176.0 [m] From Nr. Lateral: 4 To Nr. Lateral: 4
Length: 176.0 [m] From Nr. Lateral: 5 To Nr. Lateral: 5
Length: 176.0 [m] From Nr. Lateral: 6 To Nr. Lateral: 6
Length: 176.0 [m] From Nr. Lateral: 7 To Nr. Lateral: 7
Length: 178.0 [m] From Nr. Lateral: 8 To Nr. Lateral: 8
Length: 178.0 [m] From Nr. Lateral: 9 To Nr. Lateral: 9
Length: 178.0 [m] From Nr. Lateral: 10 To Nr. Lateral: 10
Length: 178.0 [m] From Nr. Lateral: 11 To Nr. Lateral: 11
Length: 178.0 [m] From Nr. Lateral: 12 To Nr. Lateral: 12
4 - TERRAIN SLOPE AND WATER TEMPERATURE
TEMPERATURE
Temperature= 20.0 [C]
PIPES SLOPE
Secondary pipe slope= 0.0 [%]
In this last window all the data entered are summarized.
< Back
Next >
Finish
Cancel

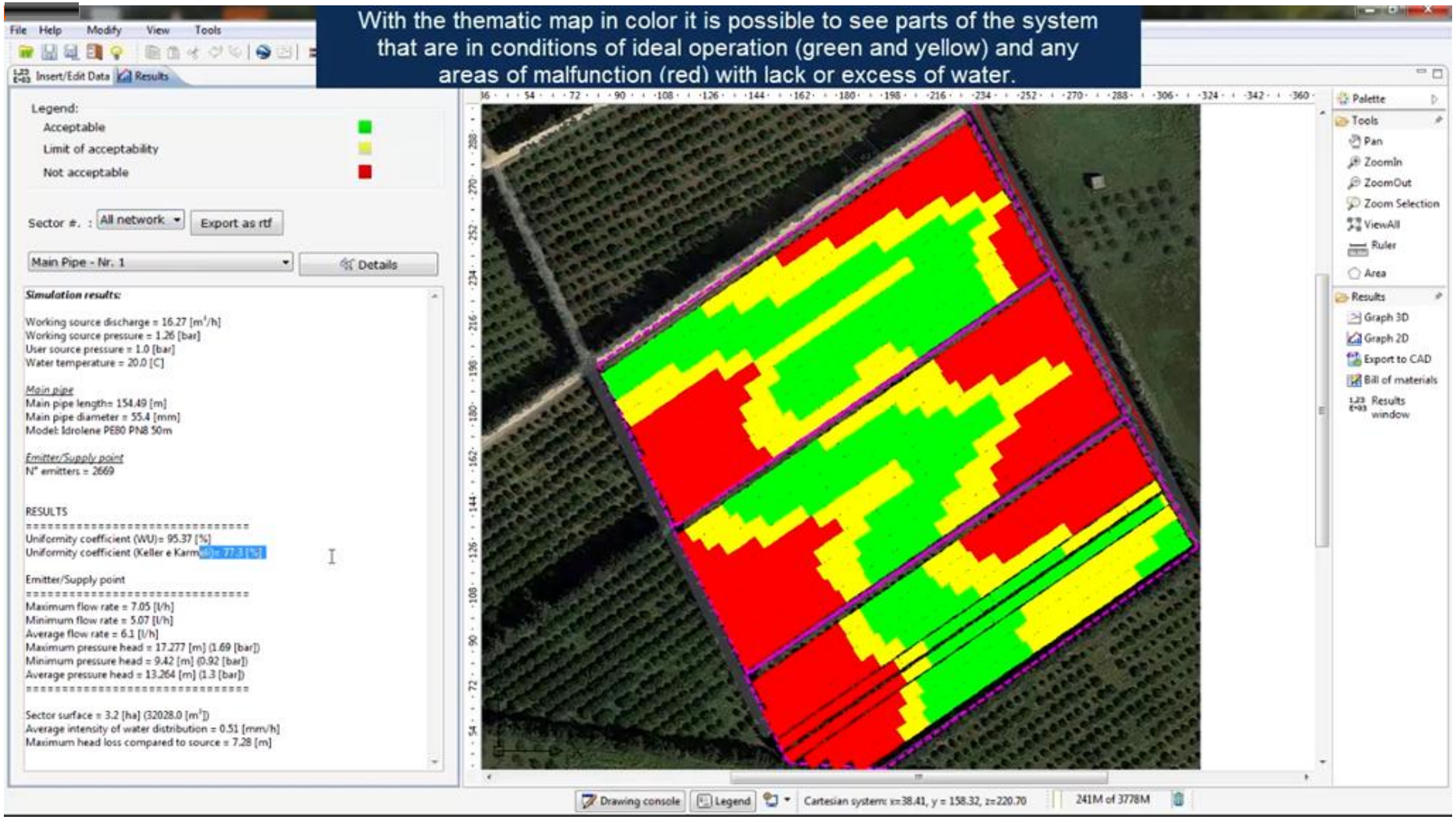


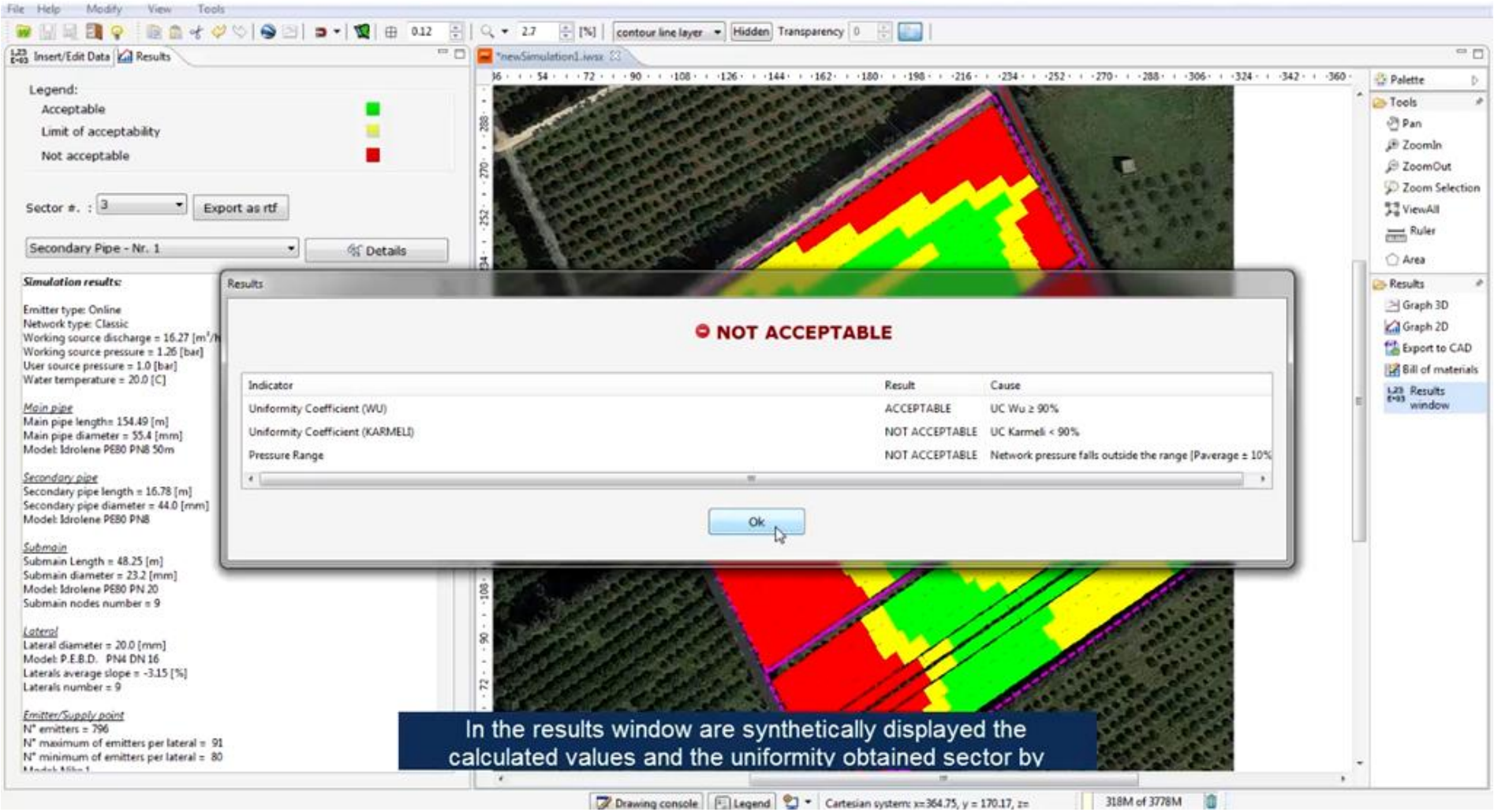
clicking on Next you draw the network

By clicking on "Calculate" it will be determined the distribution for each emitter of the flows and pressures, achieving a complete response of the network.

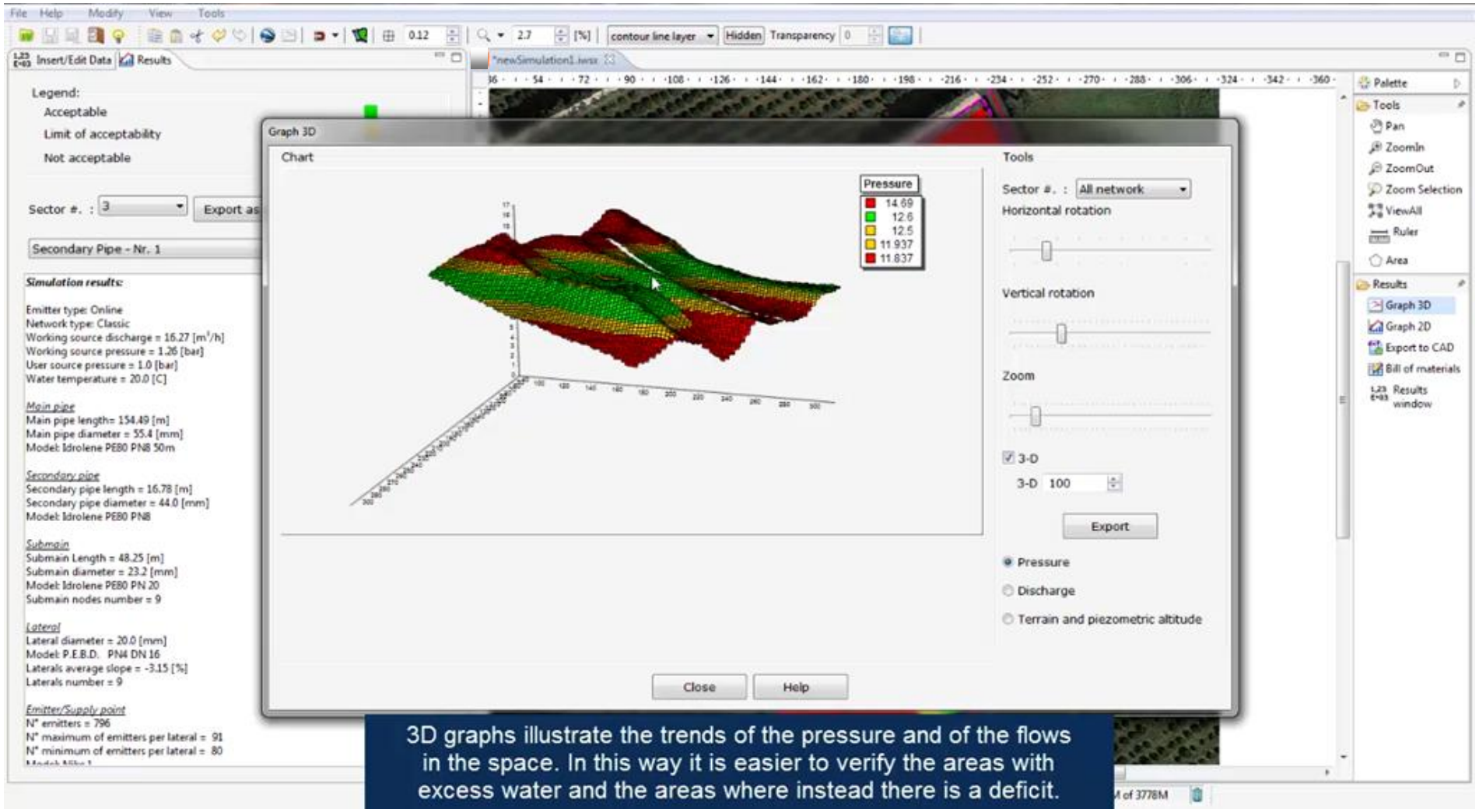


With the thematic map in color it is possible to see parts of the system that are in conditions of ideal operation (green and yellow) and any areas of malfunction (red) with lack or excess of water.



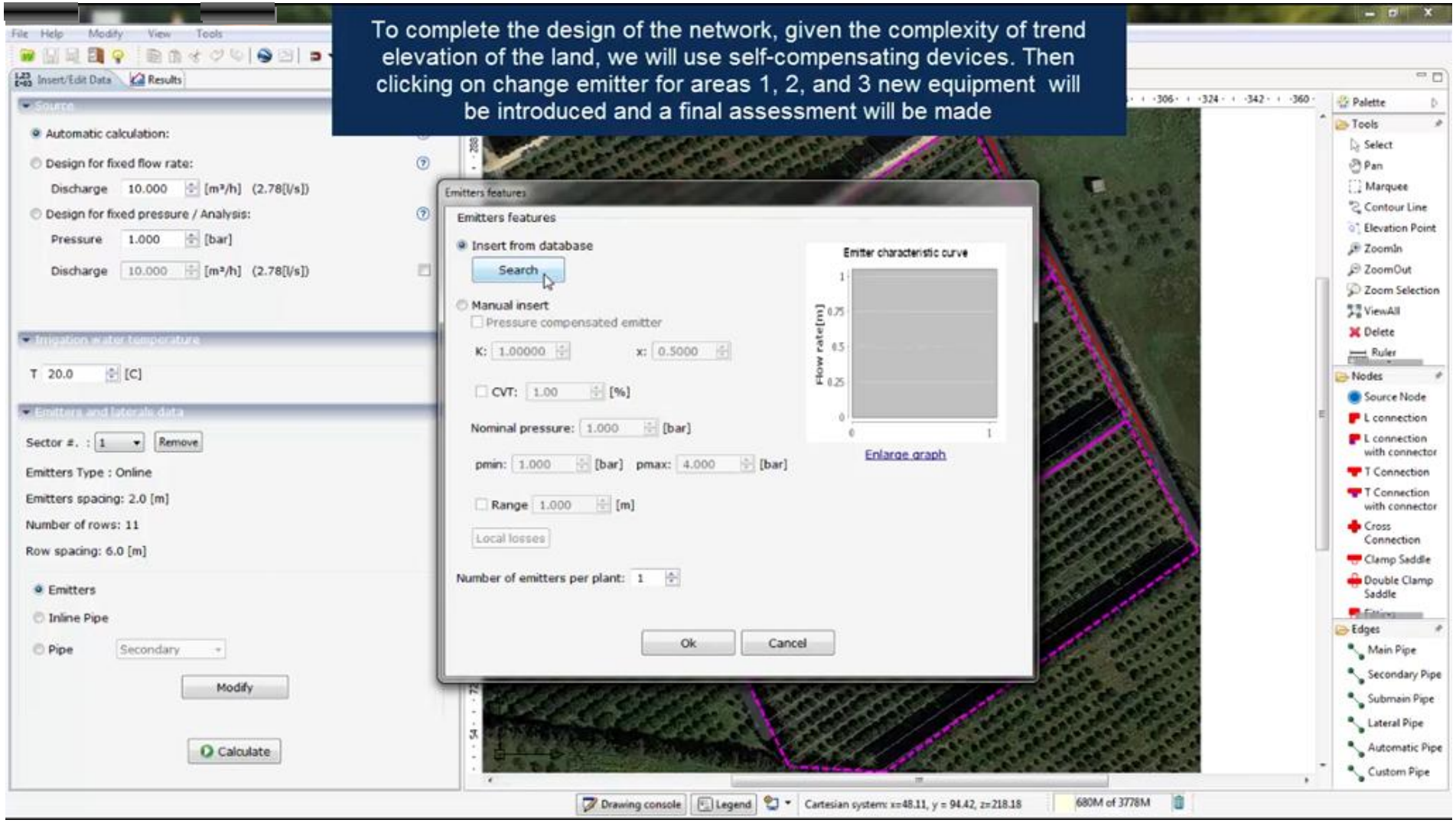


In the results window are synthetically displayed the calculated values and the uniformity obtained sector by



3D graphs illustrate the trends of the pressure and of the flows in the space. In this way it is easier to verify the areas with excess water and the areas where instead there is a deficit.

To complete the design of the network, given the complexity of trend elevation of the land, we will use self-compensating devices. Then clicking on change emitter for areas 1, 2, and 3 new equipment will be introduced and a final assessment will be made



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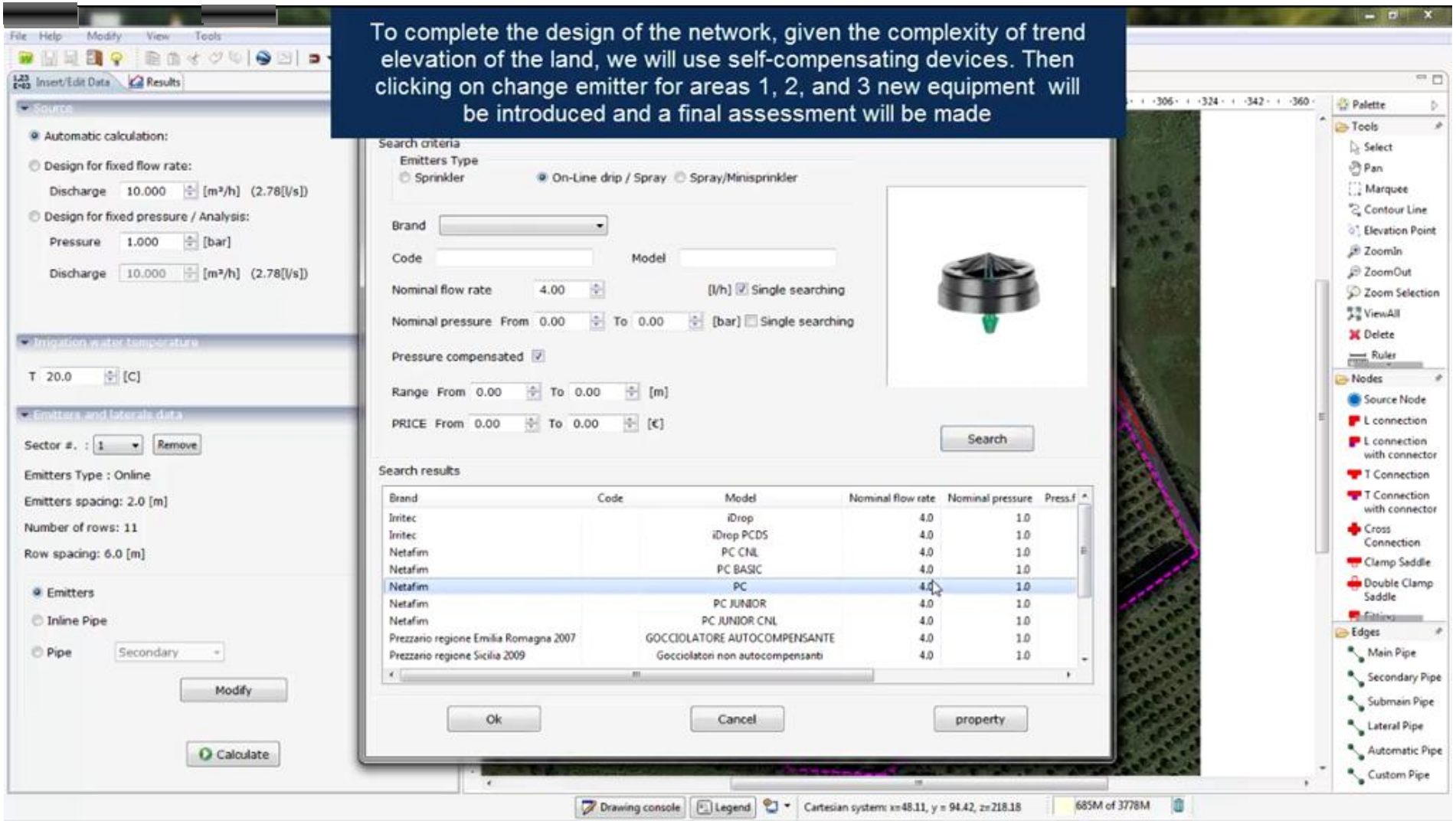
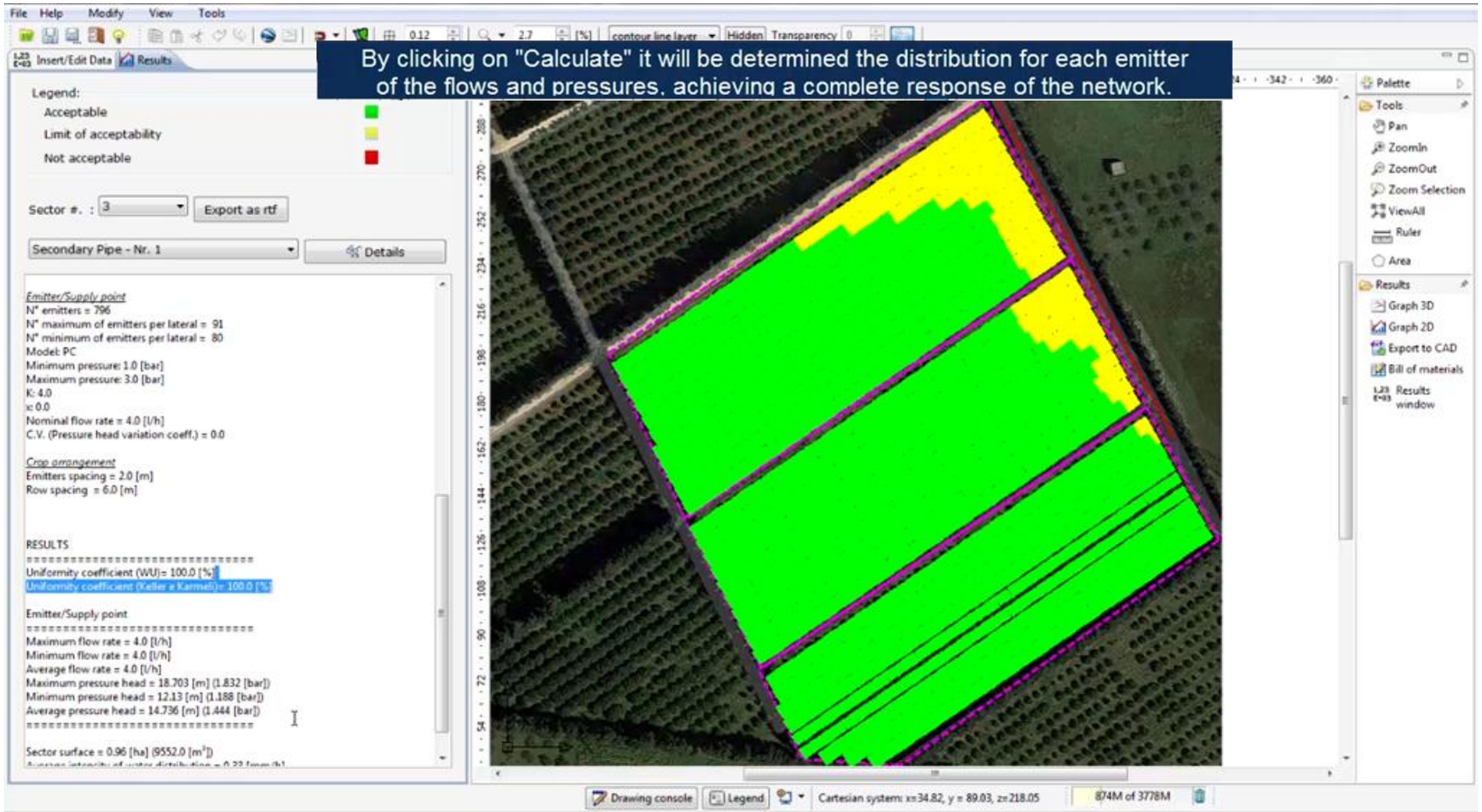
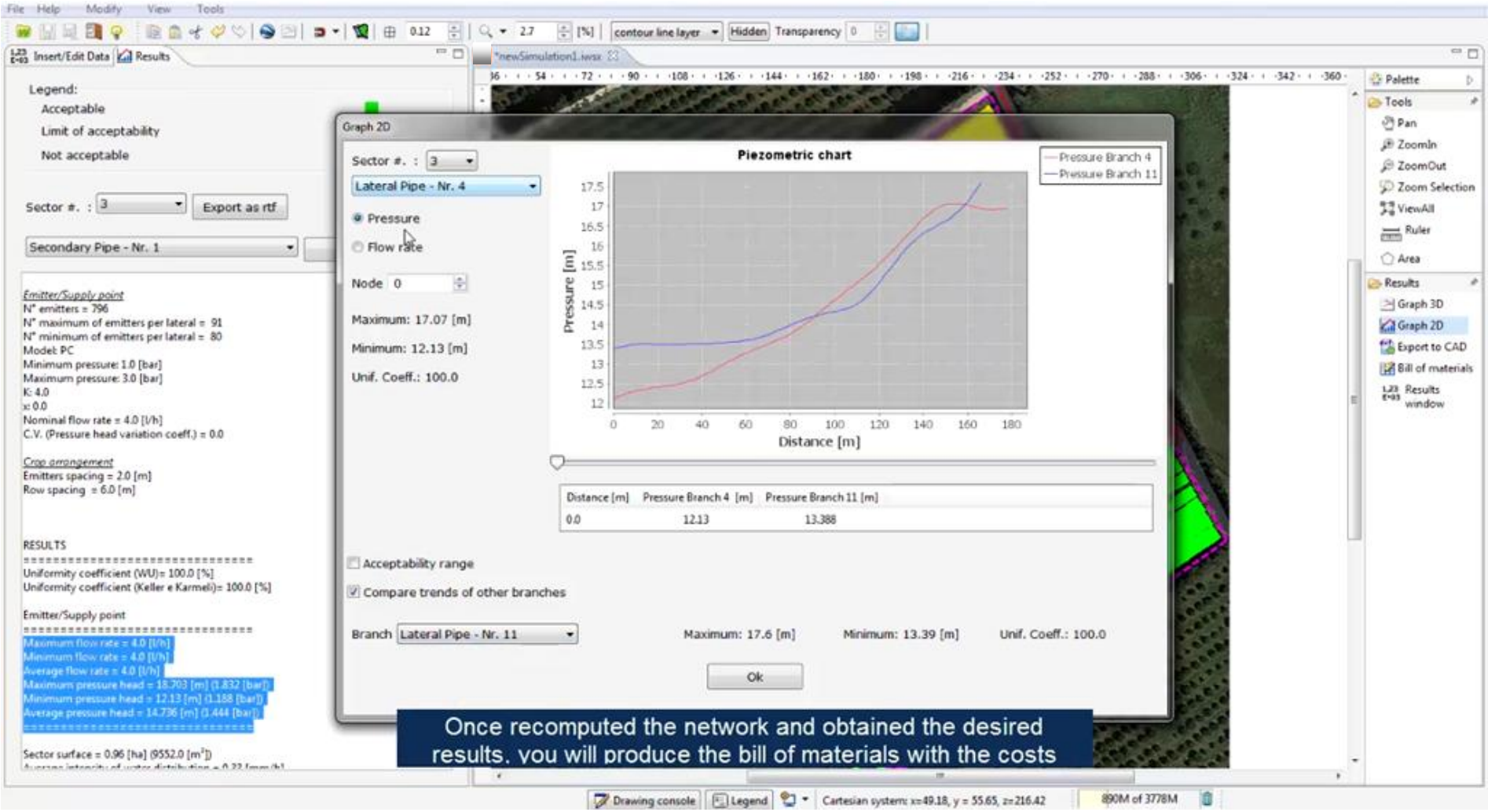



By clicking on "Calculate" it will be determined the distribution for each emitter of the flows and pressures, achieving a complete response of the network.
File Help Modify View Tools
Insert/Edit Data
Results
Legend:
Acceptable
Limit of acceptability
Not acceptable
Sector #. : 3
Export as rtf
Secondary Pipe - Nr. 1
Details
Emitter/Supply point
N° emitters = 796
N° maximum of emitters per lateral = 91
N° minimum of emitters per lateral = 80
Model: PC
Minimum pressure: 1.0 [bar]
Maximum pressure: 3.0 [bar]
K: 4.0
x: 0.0
Nominal flow rate = 4.0 [l/h]
C.V. (Pressure head variation coeff.) = 0.0
Crop arrangement
Emitters spacing = 2.0 [m]
Row spacing = 6.0 [m]
RESULTS
Uniformity coefficient (WU)= 100.0 [%]
Uniformity coefficient (Keller e Karmeli)= 100.0 [%]
Emitter/Supply point
Maximum flow rate = 4.0 [l/h]
Minimum flow rate = 4.0 [l/h]
Average flow rate = 4.0 [l/h]
Maximum pressure head = 18.703 [m] (1.832 [bar])
Minimum pressure head = 12.13 [m] (1.188 [bar])
Average pressure head = 14.736 [m] (1.444 [bar])
Sector surface = 0.96 [ha] (9552.0 [m²])
Palette
Tools
Pan
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Ruler
Area
Results
Graph 3D
Graph 2D
Export to CAD
Bill of materials
Results window
Drawing console
Legend
Cartesian system: x=34.82, y = 89.03, z=218.05
874M of 3778M



Once recomputed the network and obtained the desired results, you will produce the bill of materials with the costs

Once recomputed the network and obtained the desired results, you will produce the bill of materials with the costs of the project, considering the price list of the products.

File Help Modify View Tools

Results

Simulation results:

Working source discharge = 13.5 [m³/h]
Working source pressure = 0.87 [bar]
User source pressure = 1.0 [bar]
Water temperature = 20.0 [C]

Main pipe
Main pipe length= 207.12 [m]
Main pipe diameter = 66.0 [mm]
Model: PEAD PN4 DN75

Emitter/Supply point
N° emitters = 3374

RESULTS
==========
Uniformity coefficient (WU)= 100.0 [%]
Uniformity coefficient (Keller e Karmeli)= 100.0 [%]

Emitter/Supply point
==========
Maximum flow rate = 4.0 [l/h]
Minimum flow rate = 4.0 [l/h]
Average flow rate = 4.0 [l/h]
Maximum pressure head = 17.607 [m] (1.72 [bar])
Minimum pressure head = 8.274 [m] (0.81 [bar])
Average pressure head = 12.38 [m] (1.21 [bar])
==========

Sector surface = 3.37 [ha] (33740.0 [m²])
Average intensity of water distribution = 0.4 [mm/h]
Maximum head loss compared to source = 3.65 [m]

Back

Report

1 of 2 100%

BILL OF MATERIAL

12/07/2015 17.33.12

IRRI PRO

powered by irriworks

Pipes

N.	Code	Brand	Model	PN[bar]	DN / Dint.[mm]	Length [m]	QN[m³/h]	Spacing [m]	Number of coils/rods	Price[€]
1	PELAB07504100	Plast Project	PEAD PN4 DN75	4.0	75.0	207.12			3	1011.0
2	PELAB06304100	Plast Project	PEAD PN4 DN63	4.0	63.0	11.78			1	236.0
3	PELAB03204200	Plast Project	PEAD PN4 DN32	4.0	32.0	176.16			1	124.0
4	PELAB02004300	Plast Project	PEAD PN4 DN20	4.0	20.0	6785.85			23	2415.0

Adapters

N.	Code	Brand	Model	Type	D1[mm]	D2[mm]	D3[mm]	D4[mm]	Number	Price[€]
1	Generic	Generic	Generic	T Connection	75.0	75.0	63.0		3	

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Pag. 1 / 2

1 of 2

Drawing console | Legend | Cartesian system: x=354.23, y = 140.97, z=227.27 | 263M of 3778M