

**DETAILED DESCRIPTION OF THE SUBJECT MATTER OF THE CONTRACT
FOR THE SUPPLY OF SPECIALIZED SOFTWARE UNDER THE PROJECT NAMED:
"CENTER FOR SUSTAINABLE MANAGEMENT OF MINERALS AND ENERGY"**

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DIVIDED INTO PARTS

This document is a detailed description of the subject matter of the contract for the purchase of specialist software. The Ordering Party has divided the contract into parts. Detailed description of the subject matter of the contract, within the scope of each part, has been defined by the Ordering Party individually for each program.

NOTICE:

The Ordering Party informs that the object of its activity is to conduct scientific research in the fields of technical sciences, earth sciences and economic sciences on the broadly understood management of mineral resources and energy management, and to disseminate the results of this research. The Ordering Party is authorized to confer the degree of Doctor of Technical Sciences in the discipline of mining and engineering geology. The Ordering Party, as a scientific unit, is not a commercial entity.

I. Subject matter of the contract

Part:

1. MATLAB

The subject matter of the contract is the delivery of MATLAB software. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery item	License type	Number of positions/ number of licenses
1	MATLAB/ modules	Academic Use Concurrent Perpetual	6
	Simulink	Academic Use Concurrent Perpetual	2
	Curve Fitting Toolbox	Academic Use Concurrent Perpetual	3
	Database Toolbox	Academic Use Concurrent Perpetual	1
	Deep Learning Toolbox	Academic Use Concurrent Perpetual	3

Econometrics Toolbox	Academic Use Concurrent Perpetual	3
Financial Toolbox	Academic Use Concurrent Perpetual	3
Global Optimization Toolbox	Academic Use Concurrent Perpetual	3
Mapping Toolbox	Academic Use Concurrent Perpetual	2
MATLAB Compiler	Academic Use Concurrent Perpetual	1
Optimization Toolbox	Academic Use Concurrent Perpetual	3
Parallel Computing Toolbox	Academic Use Concurrent Perpetual	3
Partial Differential Equation Toolbox	Academic Use Concurrent Perpetual	3
Signal Processing Toolbox	Academic Use Concurrent Perpetual	2
SimEvents	Academic Use Concurrent Perpetual	1
Spreadsheet Link	Academic Use Concurrent Perpetual	2
Statistics and Machine Learning Toolbox	Academic Use Concurrent Perpetual	3
Symbolic Math Toolbox	Academic Use Concurrent Perpetual	1

No	Delivery item	Requirements
1.	MATLAB	<p>MATLAB with add-ons / modules:</p> <ul style="list-style-type: none"> • Simulink • Curve Fitting Toolbox • Database Toolbox • Deep Learning Toolbox • Econometrics Toolbox • Financial Toolbox • Global Optimization Toolbox • Mapping Toolbox • MATLAB Compiler • Optimization Toolbox • Parallel Computing Toolbox • Partial Differential Equation Toolbox • Signal Processing Toolbox • SimEvents • Spreadsheet Link • Statistics and Machine Learning Toolbox • Symbolic Math Toolbox <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution under a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by

		<p>the user (for perpetual/lifetime licenses - valid indefinitely).</p> <ul style="list-style-type: none"> • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. • The description of the equivalent solution should contain at least the parameters and functionalities for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) enables the control of data processing activities for the needs of multi-core architecture of processors, graphics processors and computing classes,
- b) allows to perform financial analyses and calculations (fixed income planning, bond yield studies, cash flow calculations, interest rate calculations),
- c) enables analysis of geographical information and display of maps with the possibility of access to external geographical sources,
- d) has a set of functions for symbolic calculations,
- e) has a set of functions for the numerical solution of partial differential equations by the finite element method,
- f) includes applications and functions for fitting curves and surfaces to data and a set of tools for performing exploratory data analysis, pre- and post-processing data, comparing candidate models and removing outliers,
- g) provides functions and applications for analysis, preprocessing and feature extraction from uniformly and unevenly sampled signals and has a set of tools for designing and analyzing

filters, resampling, smoothing, detrending and estimating the power spectrum of the analyzed signals.

2. CorelDraw

The subject matter of the contract is the delivery of CorelDraw program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	CorelDraw	educational use individual licence	10

No	Delivery Item	Requirements
1.	CorelDraw	<p>CorelDraw:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution under a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. • The description of the equivalent solution should contain at least the parameters and functionalities for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party.

		<ul style="list-style-type: none"> The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to open and edit files with extension .cdr.
- b) ability to open and edit basic, most popular graphic file formats.

3. Grapher

The subject matter of the contract is the delivery of Grapher program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery item	License Type	Number of positions/ number of licenses
1.	Grapher v. 19 or higher	Concurrent Use Commercial License	3

No	Delivery Item	Requirements
1.	Grapher v. 19 or higher.	<p>Grapher v. 19 or higher.</p> <ul style="list-style-type: none"> A license authorizing the use of the software on an unlimited number of devices at a single institution under a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. The description of the equivalent solution should contain at least the parameters and functionalities

		<p>for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party.</p> <ul style="list-style-type: none"> • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to construct advanced 2D and 3D charts, including bar, triaxial, pie, candlestick and 3D bubble charts,
- b) ability to build two - and three-dimensional contour maps of surfaces,
- c) ability to digitize graphs from image files,
- d) ability to open and edit files with the extension *.grf.

4. Surfer

The subject matter of the contract is the delivery of Surfer program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Surfer v.23 or higher	Concurrent Use Commercial License	3

No	Delivery Item	Requirements
1.	Surfer v.23 or higher	<p>Surfer v.23 or higher</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date

		<p>of installation by the user (the moment of installation corresponding to the date of supply).</p> <ul style="list-style-type: none"> • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. • The description of the equivalent solution should contain at least the parameters and functionalities for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) possibility of construction and advanced editing of 2D and 3D maps,
- b) possibility of using advanced algorithms of data interpolation on the basis of which it is possible to construct and analyze maps in detail,
- c) availability of map digitization features,
- d) ability to support different types of cartographic projections, which allows you to match data and grid files from different coordinate systems,
- e) ability to create three-dimensional volumetric charts,
- f) read, edit and write support for files with extensions such as *.grd, *.shp and *.srf.

5. Voxler

The subject matter of the contract is the delivery of Voxler program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Voxler v. 4 or higher	2 Single User Commercial Licenses	2

No	Delivery Item	Requirements
1.	Voxler v. 4 or higher	<p data-bbox="699 282 943 315">Voxler v. 4 or higher</p> <ul style="list-style-type: none"> <li data-bbox="746 365 1356 633">• A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). <li data-bbox="746 645 1356 913">• The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). <li data-bbox="746 925 1356 1037">• If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. <li data-bbox="746 1048 1356 1160">• A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. <li data-bbox="746 1171 1356 1440">• The description of the equivalent solution should contain at least the parameters and functionalities for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. <li data-bbox="746 1451 1356 1563">• The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to create three-dimensional volumetric charts,
- b) ability to construct streamline plots, scatter plots and cutplane plots,
- c) ability to create a uniform three-dimensional grid using the inverse distance method and local polynomial for XYZ data with scatter, and allows you to calculate various metrics within a given search radius, including minimum, maximum and mean, quartiles, standard deviation, variance, power, density and distance to nearest or farthest point,

- d) ability to import and visualize data from boreholes,
- e) ability to open and edit files with extension .voxb.

6. Mathcad Prime

The subject matter of the contract is the delivery of Mathcad Prime program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Mathcad Prime 7.x.x.x	2 single user professional licenses	2

No	Delivery Item	Requirements
1.	Mathcad Prime 7.x.x.x	<p>Mathcad Prime minimum version 7.0.0.0, with add-ons:</p> <p style="padding-left: 40px;">a)file converter of older program versions to the newest version (standard MathCad Prime 7.0.0.0 add-on).</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence.

		<ul style="list-style-type: none"> • A contractor offering an equivalent solution is obliged to include a description of equivalent software in the offer. • The description of the equivalent solution should contain at least the parameters and functionalities for the equivalent software as defined above. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to open and edit files with extension "xmcd", worksheets use external data files and user libraries,
- b) possibility of using units of measurement allowing for their free use including defining your own, non-standard units of measurement,
- c) checking the correctness of the entered calculation formulas in terms of the correctness of the used units of measurement (ifor example it will not allow to add Watts to Joule),
- d) possibility to programming using basic loops (while, if, for, etc.),
- e) fully functional converter for MathCad files in versions older than MathCad Prime 7 in particular from MathCad 14 version to MathCad Prime 7 version.

7. General Algebraic Modelling System (GAMS)

The subject matter of the contract is the delivery of General Algebraic Modelling System (GAMS) program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	General Algebraic Modelling System (GAMS)	Commercial License for Single User (x86_64 system)	2

		+ Academic License in MUD version for a maximum of 5 concurrent users (x86_64 system)	
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No	Delivery Item	Requirements
1.	General Algebraic Modelling System (GAMS)	<ul style="list-style-type: none"> • Commercial License (for Single User) algebraic modelling system – General Algebraic Modelling System (GAMS) – with Solvers, including: <ul style="list-style-type: none"> ○ GAMS Base Module, ○ GAMS/CPLEX solver, ○ GAMS/DECIS solver (version to connect with CPLEX solver). • Academic License (MUD type, for a maximum of 5 concurrent users) algebraic modelling system – General Algebraic Modelling System (GAMS) – with solvers and with add-ons including: <ul style="list-style-type: none"> ○ GAMS Base Module, ○ GAMS/CPLEX solver, ○ GAMS/DECIS solver (version to connect with CPLEX solver), ○ GAMS/GUROBI Solver-Link. • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows for the possibility of offering software equivalent to the software mentioned above. By equivalent software the Ordering Party shall understand software which will have all of the following features fulfilled:

- a) ensuring compatibility with mathematical models built and developed at the Division of Energy Economics IGSMiE PAN saved in .gms (enabling opening, editing, saving, compiling and

- executing in the provided system, and consequently obtaining the numerical solution of the model) and .gpr format,
- b) ability to open, edit, and save files in .gdx format, ability to directly import data from .gdx format into the modeling system,
 - c) ability to display, edit and compile the formatted syntax of models saved in .gms,
 - d) ability to hint at potential syntax errors in the compiled model saved in .gms format,
 - e) ability to import data into models saved in .gms format from .xlsx spreadsheets,
 - f) ability to export the results of the numerical solution of models saved in .gms format to .xlsx spreadsheets,
 - g) enabling the solution of large-scale linear mathematical programming problems (linear programming), quadratic (quadratic programming), integer (integer programming) and mixed-integer linear (mixed-integer linear programming),
 - h) enabling the solution of large-scale stochastic programming problems using MonteCarlo sampling.

8. Itasca FLAC3D

The subject matter of the contract is the delivery of Itasca FLAC3D program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Itasca FLAC3D version 7.0 - updating a currently held key FLAC3D version 5.0	academic network license (Dynamic, Creep, Thermal Options + Network License)	1

No	Delivery Item	Requirements
1.	Itasca FLAC3D version 7.0 - updating a currently held key FLAC3D version 5.0 <ul style="list-style-type: none"> • key number (Key 13143) 	Itasca FLAC3D with add-ons: <ul style="list-style-type: none"> • dynamic option, • creep option, • thermal option, • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of

		<p>installation by the user (the moment of installation corresponding to the date of supply).</p> <ul style="list-style-type: none"> • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- availability of a calculation scheme based on the finite volume method (Finite Volume Method),
- the possibility of modeling the nonlinear behavior of the analyzed material,
- built-in programming language that allows editing and supports the operation of basic commands,
- ability to model the three-dimensional propagation of seismic waves in the time domain,
- ability to model associated thermal and mechanical processes and interactions in the time domain,
- ability to open files with extension .f3sav, .f3prj.

9. Itasca 3DEC

The subject matter of the contract is the delivery of Itasca 3DEC program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Itasca 3DEC version 7.0	Academic Network License (Dynamic Option, Thermal)	1

		Option, Structure Option + Network License)	
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No	Delivery Item	Requirements
1.	Itasca 3DEC version 7.0	<p>Itasca 3DEC with add-ons:</p> <ul style="list-style-type: none"> a) dynamic option, b) thermal option, c) structure option. <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to simulate three-dimensional response of discontinuous media (such as interconnected rock or masonry structures) that are subject to static or dynamic loading,

- b) an explicit scheme of the distinct elements method for computation is available,
- c) possibility to analyze separate elements/blocks that are not deformable (rigid) or can be deformed, and allows you to specify separate models for the behavior of the connections between these blocks],
- d) built-in FISH scripting language,
- e) three-dimensional, fully dynamic wave propagation simulation capability for earthquake, explosion, impulse loading and shock analysis,
- f) ability to simulate transient heat conduction in materials and the development of thermally induced displacements and stresses,
- g) ability to open and edit files with extension .3dsav, .3dprj.

10. Itasca Griddle (+Rhinoceros) & BlockRanger

The subject matter of the contract is the delivery of Itasca Griddle & BlockRanger program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Itasca Griddle (+Rhinoceros) version 2.0 BlockRanger	Academic Network License (Itasca Griddle (+Rhinoceros) & BlockRanger + Network License)	1

No	Delivery Item	Requirements
1.	Itasca Griddle (+Rhinoceros) version 2.0 <ul style="list-style-type: none"> • Version owned: Kubrix_v12, key (Key 10552) 	Itasca Griddle (+Rhinoceros) & BlockRanger with additivies: a) BlockRanger. <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply).

		<ul style="list-style-type: none"> • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) possibility of constructing complex computational meshes for numerical calculation programs with an option to implement and introduce discontinuities of irregular geometry,
- b) possibility to export the constructed calculation grid to formats supported by programs: FLAC3D, 3DEC, NASTRAN, ABAQUS, ANSYS, RS-DYNA, VRML.

11. Itasca PFC Suite

The subject matter of the contract is the delivery of Itasca PFC Suite program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Itasca PFC Suite version 7.0	academic network license (Itasca PFC Suite + Network License)	1

No	Delivery Item	Requirements
1.	Itasca PFC Suite version 7.0	Itasca PFC Suite: <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution

		<p>within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely).</p> <ul style="list-style-type: none"> • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to simulate the behavior of synthetic granular materials represented as single rigid particles (disks or convex polygons in 2D, spheres or convex polyhedrons in 3D) or their collection with variable size),
- b) using the discrete element method for calculations,
- c) built-in FISH scripting programming language and the ability to construct, analyze, and interpret a numerical model through the use of the PYTHON programming language,
- d) embedded models of particle behavior on contact i.e. Linear, Linear Contact Bond, Linear Parallel Bond, Hertz, Hysteretic, Smooth Joint, Flat Joint, Rolling Resistance Linear, Generic Adhesive Contact Model, Burger's, Soft Bond,
- e) ability to open and edit files with extension .sav, .prj.

12. Reflexw complete 2D/3D

The subject matter of the contract is the delivery of Reflexw complete 2D/3D program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Reflexw complete 2D/3D	commercial network license	1

No	Delivery Item	Requirements
1.	Reflexw complete 2D/3D	<p>Reflexw complete 2D/3D:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to process interpretations and modeling of two- and three-dimensional geo-radar and seismic data,
- b) seismic refraction, seismic reflection, geo-radar profiling, ultrasonic and inter-borehole data processing capabilities,
- c) ability to import data saved in formats: SEG Y, SEG2 and from seismic and geo-radar systems GSSI, RAMAC, PULSE-EKKO, ABEM, IDS, UTSI, OYO,
- d) possibility of using GPS data for positioning the processed measurement data.

13. Geogiga

The subject matter of the contract is the delivery of Geogiga program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Geogiga – additional modules (add-ons) to an existing license	academic network license (Geogiga with Optional Features: G3-VSP, G3-PS Log + Network dongle to replace 5 individual dongles)	1

No	Delivery Item	Requirements
1.	Geogiga additional modules (add-ons) to an existing license: S-GTC150170, S-GTC150171, S-GTC150172, S-GTC150180, S-GTC150181	Geogiga with add-ons: <ol style="list-style-type: none"> a) G3-VSP, b) G3-PS Log. <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence.

		<ul style="list-style-type: none"> • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to process and interpret zero-offset and offset vertical borehole seismic logging data,
- b) ability to analyze the results of vertical offset seismic profiling measurements taken in an inclined borehole,
- c) possibility of effective processing of data from measurements of velocity of seismic waves in boreholes and, in particular, calculations of interval velocity, average velocity, Poisson's ratio, modulus of elasticity (shear modulus, Young's modulus, bulk modulus) and angle of internal friction.

14. FEFLOW FMH3

The subject matter of the contract is the delivery of FEFLOW FMH3 program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	FEFLOW FMH3 v. 7.2 or higher	commercial network license	1

No	Delivery Item	Requirements
1.	FEFLOW FMH3 v. 7.2 or higher	FEFLOW FMH3 v. 7.2 or higher

		<ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) possibility of 3-dimensional modeling of transient groundwater flow and heat transport in porous media, in particular modeling of geothermal reservoirs,
- b) solving systems of equations based on the finite element method,
- c) includes thermodynamic parameters of water (such as density and dynamic viscosity) are determined as a function of temperature,
- d) ability to model contaminant transport in porous media,
- e) ability to use and create unstructured meshes to represent fault surfaces, among other things,
- f) possibility to calibrate the model using PEST software,
- g) ability to simulate borehole heat exchangers (OWC) - single as well as a set of multiple OWC (Borehole Thermal Energy Storage technology),
- h) graphical user interface for model building, running simulations and visualizing results,
- i) ability to analyze the flow balance within the limits of the computational model,

- j) ability to edit and execute scripts written in the Python 3.x programming language
- k) support shapefile files (*.shp) and FeFlow (*.fem) files.

15. PetraSim

The subject matter of the contract is the delivery of PetraSim program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	PetraSim Core Module + PetraSim TOUGH2/T2VOC Interface	commercial network license	1

No	Delivery Item	Wymagania
1.	PetraSim Core Module	<p>PetraSim Core Module with add-ons:</p> <p>a) PetraSim TOUGH2/T2VOC Interface.</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that

		<p>the software offered as equivalent meets the requirements specified by the Ordering Party.</p> <ul style="list-style-type: none"> • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to simulate mass and heat transport in 3-dimensional porous media,
- b) accessible graphical user interface for model building, assigning boundary and initial conditions, running simulations and visualizing results,
- c) support for computational simulators of the TOUGH family, i.e. TOUGH2 and TOUGH3.

16. iTOUGH2

The subject matter of the contract is the delivery of iTOUGH2 program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	iTOUGH2 – executable files	commercial single user license	1

No	Delivery Item	Wymagania
1.	iTOUGH2 – executable files	<p>iTOUGH2 – executable files</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply).

		<ul style="list-style-type: none"> • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- possibility of inverse modeling (so-called iverse modeling) of mass and heat transport processes in 3-dimensional porous media based on TOUGH2 or TOUGH3 calculation code,
- possibility of statistical evaluation of the obtained models,
- ability to perform a sensitivity assessment of the models to a change in the value of the input parameters,
- uses the PEST protocol to calibrate models.

17. TRNSYS

The subject matter of the contract is the delivery of TRNSYS program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	TRNSYS v. 18 or higher	commercial network license	1

No	Delivery Item	Requirements
1.	TRNSYS v. 18 or higher	TRNSYS v. 18 or newer with add-ons:

„Centrum Zrównoważonej Gospodarki Surowcami i Energią” – projekt współfinansowany ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Regionalnego Programu Operacyjnego Województwa Małopolskiego na lata 2014-2020

		<ul style="list-style-type: none"> a) TESS Geothermal Heat Pump (GHP) Component Library, b) TESS Electrical Component Library, c) TESS Optimization Component Library, d) TESS Solar Collector Component Library, e) ESS Storage Tank Component Library, f) TESS Cogeneration (CHP) Component Library. <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to simulate transient/dynamic energy systems,
- b) graphical programming environment for the construction and simulation of energy systems, in particular those related to heat transfer,
- c) built-in component database for power system simulation,

- d) module is available to simulate the operation of a set of borehole heat exchangers based on g-functions applicable to the modeling of BTES technology (Borehole Thermal Energy Storage),
- e) module is available to simulate the operation of solar collectors,
- f) module is available to simulate heat pump operation,
- g) module is available to simulate the operation of buffer heat tanks,
- h) ability to load and handle climate data,
- i) available functionality to search for the optimal solution.

18. Aquachem

The subject matter of the contract is the delivery of Aquachem program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Aquachem v. 10 or higher	commercial network license	1

No	Delivery Item	Requirements
1.	Aquachem v. 10 or higher	<p>Aquachem v. 10 or higher</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality.

		<ul style="list-style-type: none"> • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) fully integrated package designed for graphical and numerical analysis and modeling of water quality data,
- b) extensive database of geochemical coefficients, which allows for comprehensive interpretation, visualization, and modeling of chemical composition data for groundwater samples,
- c) built-in analytical tools include many equations and formulas to interpret and describe geochemical water data,
- d) range of functions including basic unit transformations and load balances, as well as more complex statistical analyses and geothermal calculations,
- e) possibility to compare parameters using bar graphs,
- f) available spatial analysis,
- g) adding text annotations to the chart,
- h) ability to import and export files to MS Excel 2007 and MS Access 2007,
- i) supported project file types: Advanced Demo Project i Database Template,
- j) numerical and graphical geochemical analysis of water available,
- k) water quality data modeling,
- l) possibility of calculating geochemical parameters of water: total anions, cations, charge balance, hardness, alkalinity, dissolved minerals,
- m) available statistical calculations: mean value, dispersion, linear correlation matrix,
- n) possibility of indicating results that exceed water quality standards,
- o) ability to report laboratory testing of groundwater samples,
- p) analysis and management of water laboratory data along with control of water quality data from contaminated areas,
- q) creation of graphs and reports enabling precise visualization of data, in particular diagrams: Piper, Stiff, Durov, Langelier-Ludwig, Schoeller, triangle diagram, and pie charts, scatter, cake, frequency histograms, geothermal charts and more,
- r) ability to geochemically model properties such as saturation indices, Ph, Eh and load them back into the program database.

19. Aquifer Test Pro

The subject matter of the contract is the delivery of Aquifer Test Pro program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Aquifer Test Pro v. 11.0 or higher	commercial network license	1

No	Delivery Item	Requirements
1.	Aquifer Test Pro v. 11.0 or higher	<p>a) Aquifer Test Pro v. 11.0 or higher</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) ability to analyze pumping results for horizontal wells,
- b) ability to analyze the “slug” tests - flooding the holes,
- c) possibility of determining the size of the wall effect "skin effect",
- d) ability to open files with extension “HYT”.

20. TOUGHREACT

The subject matter of the contract is the delivery of TOUGHREACT program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	TOUGHREACT 4.13-OMP version	academic noncommercial license executable version	1

No	Delivery Item	Requirements
1.	TOUGHREACT 4.13-OMP version	<p>a) TOUGHREACT 4.13-OMP</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality.

		<ul style="list-style-type: none"> • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- possibility to simulate in a transient state geochemical processes, i.e. reaction of a reservoir fluid (water, brine, CO₂) with surrounding rocks in 3-dimensional porous media in which mass and heat transport takes place (geothermal systems),
- ability to calculate permeability and porosity changes in a geothermal reservoir caused by dissolution or precipitation reactions of minerals,
- is compatible with input and output files generated by TOUGH2 or TOUGH3 program.

21. Oracle DB

The subject matter of the contract is the delivery of Oracle DB program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Oracle DB database	per user	14

No	Delivery Item	Requirements
1.	Oracle DB database	<p>Oracle DB base:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of

		<p>delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely).</p> <ul style="list-style-type: none"> • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) availability The RDBMS should use SQL query language and have a built-in internal language for creating stored procedures,
- b) availability of software for the following operating systems: Linux, MS Windows. Identical database server functionality on the above platforms,
- c) the licenses provided must not limit the number of end users using the software or the number of documents, files, records, requests, etc. processed or stored. Licenses may not be time limited,
- d) the proposed license set should be uniform. Delivery of software certified for compatibility with each other is required,
- e) availability of database migration tools between platforms on the physical (copy / convert data files) and logical (export / import tools) level.
- f) client software to connect to the database must be available on multiple hardware and system platforms (minimum range of platforms as for the database server software).

22. VENTSIM DESIGN (Advanced)

The subject matter of the contract is the delivery of VENTSIM DESIGN (Advanced) program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	VENTSIM DESIGN (Advanced)	commercial single user license	1

No	Delivery Item	Requirements
1.	VENTSIM DESIGN (Advanced)	<p>VENTSIM DESIGN (Advanced) program:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) 3D design modeling, simulation and optimization of ventilation systems in underground mines,
- b) available 3D graphics environment with smooth rotation, zooming and panning,
- c) possibility to model real dimensions and shapes of ventilation workings,
- d) ability to model heat and moisture with the surrounding mountain,
- e) ability to model cooling or heating of the air,
- f) airflow simulation and fan modeling capabilities,
- g) ability to simulate the spread of contaminants,
- h) ability to simulate emergency situations,
- i) air flow animation available,
- j) ability to import pit designs (axes, solids) from the mining planning packages Deswik Datamine,
- k) possibility to import DXF files.

23. Leapfrog Geo

The subject matter of the contract is the delivery of Leapfrog Geo program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Leapfrog Geo	1 academic network license	1

No	Delivery Item	Requirements
1.	Leapfrog Geo	<p>Leapfrog Geo program:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of

		<p>installation by the user (the moment of installation corresponding to the date of supply).</p> <ul style="list-style-type: none"> • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) possibility of three-dimensional geological modeling and visualization of deposits using implicit modelling (implicit modelling),
- b) modeling of reservoir structure and quality,
- c) creation of geological models from borehole data, structural geological data, CAD data (points, polylines and grids),
- d) analyze source data using statistical tools (dot plots, Q-Q plots, box plots, histograms),
- e) surface and solid modeling,
- f) modeling of vein deposits,
- g) modeling of stratigraphic sequences,
- h) defining the chronology of geologic surfaces,
- i) modeling of fold structures,
- j) fault modeling including relationships between fault systems,
- k) interpolation of geological data in domains with anisotropy consideration,
- l) creation, visualization and export of iso-surfaces and solids,
- m) creation of 3D block models,
- n) reservoir resource estimation,
- o) creating geologic cross sections through a geologic model,
- p) create and render scenes and animations based on the geological model,
- q) automatic updating of the model when new source data is entered,
- r) automatic updating of dependent models when changes are made to the reference model.

24. EDN

The subject matter of the contract is the delivery of EDN program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	EDN	commercial single user license	1

No	Delivery Item	Requirements
1.	EDN	<p>EDN Program</p> <ul style="list-style-type: none">• A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely).• The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply).• If an equivalent solution is offered the Contractor is required to demonstrate its equivalence.• The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality.• Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party.• The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) prediction of mining area deformation using Budryk-Knothe theory,
- b) spatio-temporal modeling of mining operations taking into account the time lag of revealed impacts,
- c) consideration of the slope of the decks,
- d) consideration of the impact of the mining fringe,
- e) consideration of distant influences,
- f) to take into account the activation of the old doves,
- g) determination of extreme deformations over time,
- h) determination of effective extreme deformations over time,
- i) creation of contour maps with mining area category boundaries.

25. ModelRisk

The subject matter of the contract is the delivery of ModelRisk program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	ModelRisk Complete Edition 7.xxx or higher	commercial network license (with college discount)	3

No	Delivery Item	Requirements
1.	ModelRisk	<p>ModelRisk Complete Edition Program:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence.

		<ul style="list-style-type: none"> • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) Monte Carlo sampling available,
- b) available time series forecasting,
- c) ability to create empirical probability distributions,
- d) ability to match theoretical probability distributions to empirical data,
- e) ability to correlate probability distributions, including using copulas,
- f) parametric and non-parametric bootstrap available,
- g) working in the Windows operating system,
- h) cooperation with excel 32-bit and 64-bit 2003 or newer,
- i) SixSigma available,
- j) ability to convert models to the @Risk and Crystall Ball standards,
- k) possibility of error analysis.

26. @RISK Pro

The subject matter of the contract is the delivery of @RISK program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	@RISK Pro	Single user license Desktop Subscription (with college discount if possible)	3

No	Delivery Item	Requirements
1.	@RISK Pro	<p>@RISK Pro:</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for at least 3 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.

The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

1. probabilistic modeling and risk analysis capabilities,
2. Monte Carlo and Hypercube sampling available,
3. available time series forecasting,
4. available multi-criteria optimization,
5. creating empirical probability distributions,
6. ability to match theoretical probability distributions to empirical data,
7. correlating probability distributions including using copulas,
8. working in the Windows operating system,
9. cooperation with 32-bit or 64-bit excel 2007 or newer,
10. Goal Seek available,

11. Stress Analysis available,
12. conversion to Crystall Ball.

27. Oracle Crystal Ball

The subject matter of the contract is the delivery of Oracle Crystal Ball program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	Oracle Crystal Ball	network license/ (network or single user) (Faculty/ academic Edition)	3

No	Delivery Item	Requirements
1.	Oracle Crystal Ball	<p>Oracle Crystal Ball</p> <ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that

		<p>the software offered as equivalent meets the requirements specified by the Ordering Party.</p> <ul style="list-style-type: none"> • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) Monte Carlo sampling available,
- b) available time series forecasting,
- c) ability to create empirical probability distributions,
- d) ability to match theoretical probability distributions to empirical data,
- e) ability to correlate probability distributions, including using copulas,
- f) parametric and non-parametric bootstrap available,
- g) working in the Windows operating system,
- h) cooperation with 32-bit or 64-bit excel 2007 or newer,
- i) SixSigma available.

28. OFFICE 365

The subject matter of the contract is the delivery of OFFICE 365 program. The Ordering Party requires the delivery of the software in accordance with the following requirements.

No	Delivery Item	License Type	Number of positions/ number of licenses
1.	OFFICE 365	network licence/ (network or single user) (Faculty Edition)	14

No	Delivery Item	Requirements
1.	OFFICE 365	<p>OFFICE 365 with add-ons:</p> <ol style="list-style-type: none"> a) MS Excel b) MS Word c) MS Power Point d) MS Outlook.

		<ul style="list-style-type: none"> • A license authorizing the use of the software on an unlimited number of devices at a single institution within a defined license type and a defined number of workstations, valid for 5 years from the time of delivery/installation by the user (for perpetual/lifetime licenses - valid indefinitely). • The ability to download, install and use, free of charge, patches and updates issued for the supplied software by the software producer for a minimum period of 12 months from the date of installation by the user (the moment of installation corresponding to the date of supply). • If an equivalent solution is offered the Contractor is required to demonstrate its equivalence. • The contractor offering an equivalent solution is obliged to include in the offer a detailed description of equivalent software and a practical demonstration of meeting the required functionality. • Description of an equivalent solution should include at least a description of the required parameters and functionalities for equivalent software. The description should clearly state that the software offered as equivalent meets the requirements specified by the Ordering Party. • The use of an equivalent solution will not require any additional action on the part of the Ordering Party.
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The Ordering Party allows the possibility to offer software equivalent to the software mentioned above. By equivalent software the Ordering Party means software that will have the following features:

- a) per user licensing,
- b) ability to work with online applications,
- c) ability to synchronize files offline as well,
- d) within the license, the ability to install on multiple devices, including mobile devices,
- e) presence of standard MS Office suite applications (minimum: word processor: spreadsheet, presentation creation, email correspondence applications),
- f) ability to share files in the cloud,
- g) advanced text editor,
- h) compatibility with older versions of MS Office,
- i) availability of communicator,
- j) availability of exchange service for email, calendar and contact synchronization,

k) Compatible with Windows, macOS, iOS and Android.