

# Supplementary Material to “Towards a common understanding of raw materials education worldwide – An international Qualification Framework for Raw Materials”

DOI: 10.5281/zenodo.4736908

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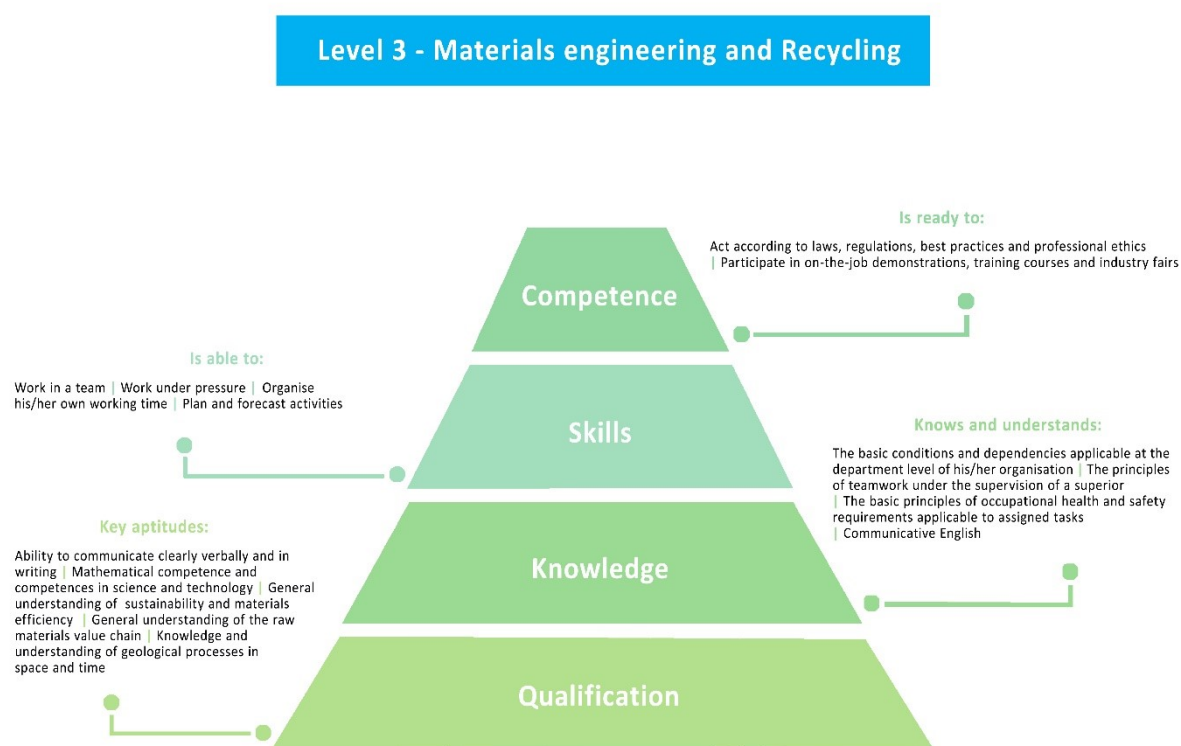
## Acknowledgements

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement No 776642.

## Description

This document contains supplementary material to the above mentioned paper, detailing the level descriptors for all topical areas mentioned in the manuscript both graphically and as tables.

# Materials engineering and recycling



Annex - Fig 1: Graphical representation of Level 3 Materials Handling and Recycling.

Level 3 –Materials engineering and Recycling
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the basic conditions and dependencies applicable at the department level of his/her organisation;</li> <li>the principles of teamwork under the supervision of a superior;</li> <li>the basic principles of occupational health and safety requirements applicable to assigned tasks.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>work in a team;</li> <li>work under pressure;</li> <li>organise his/her own working time;</li> <li>plan and forecast activities.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>act according to laws, regulations, best practices and professional ethics;</li> <li>participate in on-the-job demonstrations, training courses and industry fairs.</li> </ul>
<b>OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b>

- basic principles of metal production and recycling;
- elementary arithmetic;
- the basic principles of sustainability;
- the concept of raw materials value chain;
- safety principles within the scope of assigned tasks.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- work without risk or harm to self and others;
- perform assigned tasks in metal production and recycling operations, in due time and compliance with relevant regulations;
- use correct materials and tools;
- care for the materials and equipment used;
- plan for and notify of needed materials and tools.

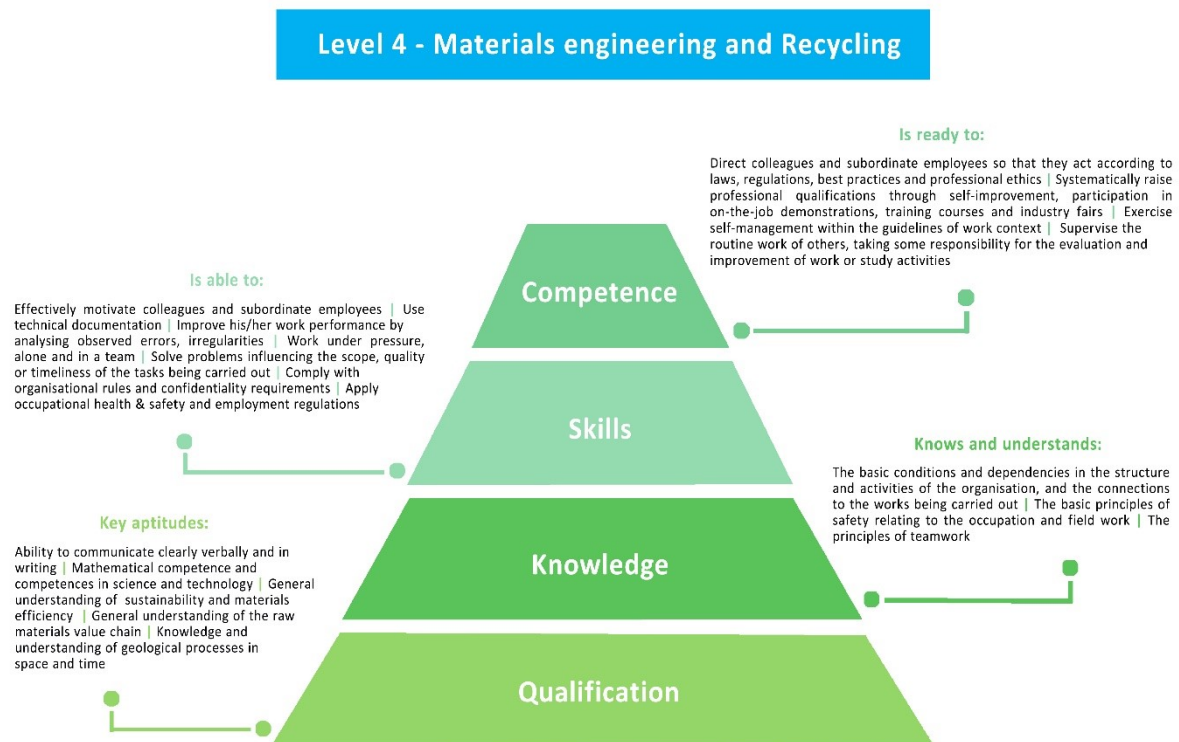
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility for assigned tasks in metal production and recycling operations;
- maintain good interpersonal relations with colleagues, customers and subcontractors;
- comply with work and occupational health and safety regulations applicable in metal production and recycling operations.

The holder of an SQF-RM Level 3 qualification works, for the most part, in the following areas:

- Metals' sorting and scrapping;
- Recycling;
- Smelting.

Example positions requiring qualifications at this level: Operations Assistant; Equipment Operator Assistant; Recycling Labourer; Sorter.



Annex - Fig 2: Graphical representation of Level 4 Materials Handling and Recycling.

Level 4 – Materials engineering and Recycling
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the basic conditions and dependencies in the structure and activities of the organisation, and the connections to the works being carried out;</li> <li>the basic principles of safety relating to the occupation and field work;</li> <li>the principles of teamwork.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>effectively motivate colleagues and subordinate employees;</li> <li>use technical documentation;</li> <li>improve his/her work performance by analysing observed errors, irregularities;</li> <li>work under pressure, alone and in a team;</li> <li>solve problems influencing the scope, quality or timeliness of the tasks being carried out;</li> <li>comply with organisational rules and confidentiality requirements;</li> <li>apply occupational health &amp; safety and employment regulations.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>direct colleagues and subordinate employees so that they act according to laws, regulations, best practices and professional ethics;</li> <li>systematically raise professional qualifications through self-improvement, participation in on-the-job demonstrations, training courses and industry fairs;</li> <li>exercise self-management within the guidelines of work context;</li> <li>supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.</li> </ul>

**OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:**

- elementary geometry, algebra and trigonometry;
- elementary physics and chemistry;
- the basics of metal production and recycling cycles;
- the raw materials value chain and the core principles of sustainability;
- health and safety requirements within the scope of assigned tasks, including plant rescue operations;
- the rules and procedures of quality assurance/quality control systems;
- the provisions and standards in force in metal production and recycling.

**OCCUPATIONAL SKILLS – IS ABLE TO:**

- use office software (spreadsheet, word processing, email) and IT equipment to organise and report activities;
- perform assigned tasks in metal production and recycling effectively, promptly and in compliance with relevant regulations;
- implement and advance initiatives aiming to safeguard environmental values and ecological services, save energy and water, and manage waste according to best practice;
- assign tasks to subordinate employees diligently and proactively and enforce their timely and suitable performance;
- cooperate with subcontractors;
- plan for and notify of needed materials and tools.

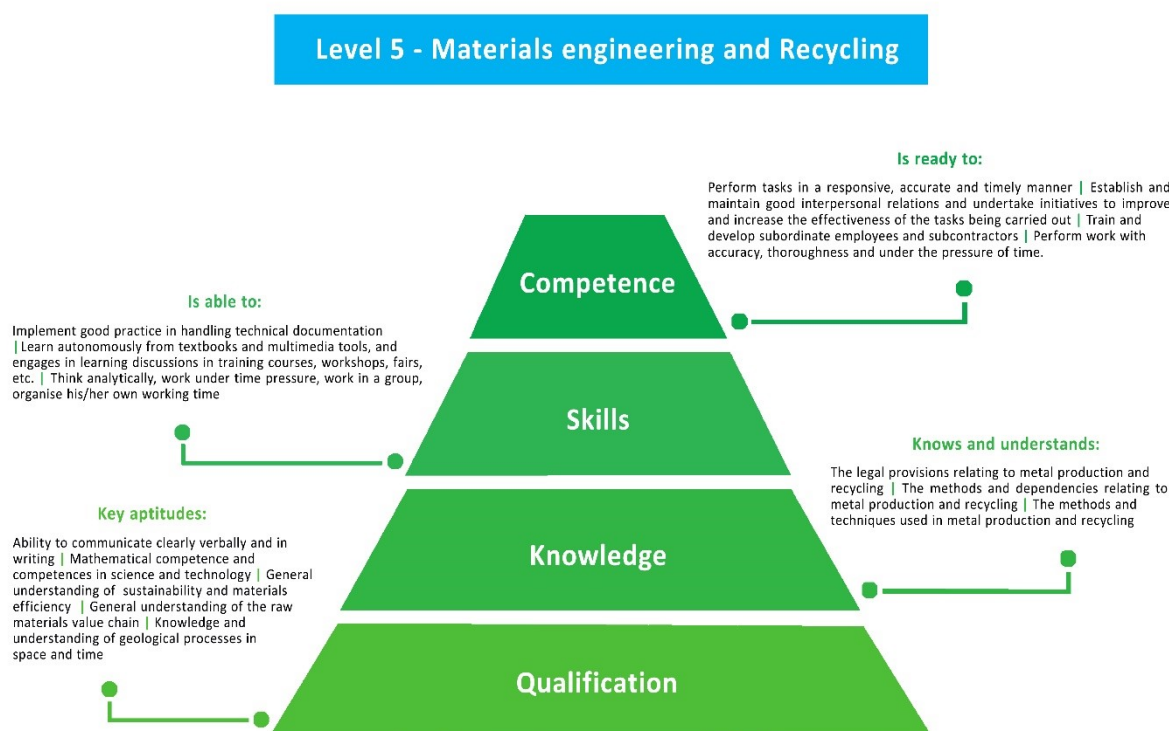
**OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:**

- assume responsibility for assigned tasks in metal production and recycling works, in compliance with applicable standards and best practice;
- observe and enforce occupational health and safety regulations;
- keep materials and equipment in a good state of repair and cleanliness;
- establish and maintain good interpersonal relations with subordinate employees, customers and subcontractors.

The holder of an SQF-RM Level 4 qualification works, for the most part, in the following areas:

- Metals' sorting and scrapping;
- Recycling;
- Smelting.

Example positions requiring qualifications at this level: Equipment Operator; Steel Mill Operator; Baler Operator; Loader Operator.



Annex - Fig 3: Graphical representation of Level 5 Materials Handling and Recycling.

Level 5 – Materials engineering and Recycling
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the legal provisions relating to metal production and recycling;</li> <li>the methods and dependencies relating to metal production and recycling;</li> <li>the methods and techniques used in metal production and recycling.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>implement good practice in handling technical documentation;</li> <li>learn autonomously from textbooks and multimedia tools, and engages in learning discussions in training courses, workshops, fairs, etc.;</li> <li>think analytically, work under time pressure, work in a group, organise his/her own working time.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>perform tasks in a responsive, accurate and timely manner;</li> <li>establish and maintain good interpersonal relations and undertake initiatives to improve and increase the effectiveness of the tasks being carried out;</li> <li>train and develop subordinate employees and subcontractors;</li> <li>perform work with accuracy, thoroughness and under the pressure of time.</li> </ul>
<b>OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the grounds of metal production and recycling methods;</li> <li>the factors that affect the outcome of metal production and/or recycling;</li> <li>the legal provisions relating to metal production and/or recycling;</li> </ul>

- environmental and social best practice in the implementation of metal production and/or recycling activities;
- occupational health and safety regulations applicable to metal production and/or recycling.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform tasks following the standard procedures of metal production and/or recycling methods and techniques;
- use IT equipment and metal production and/or recycling documentation software;
- develop and update the technical (e.g. activity planning) and economic outline (e.g. budget) of metal production and/or recycling activities.

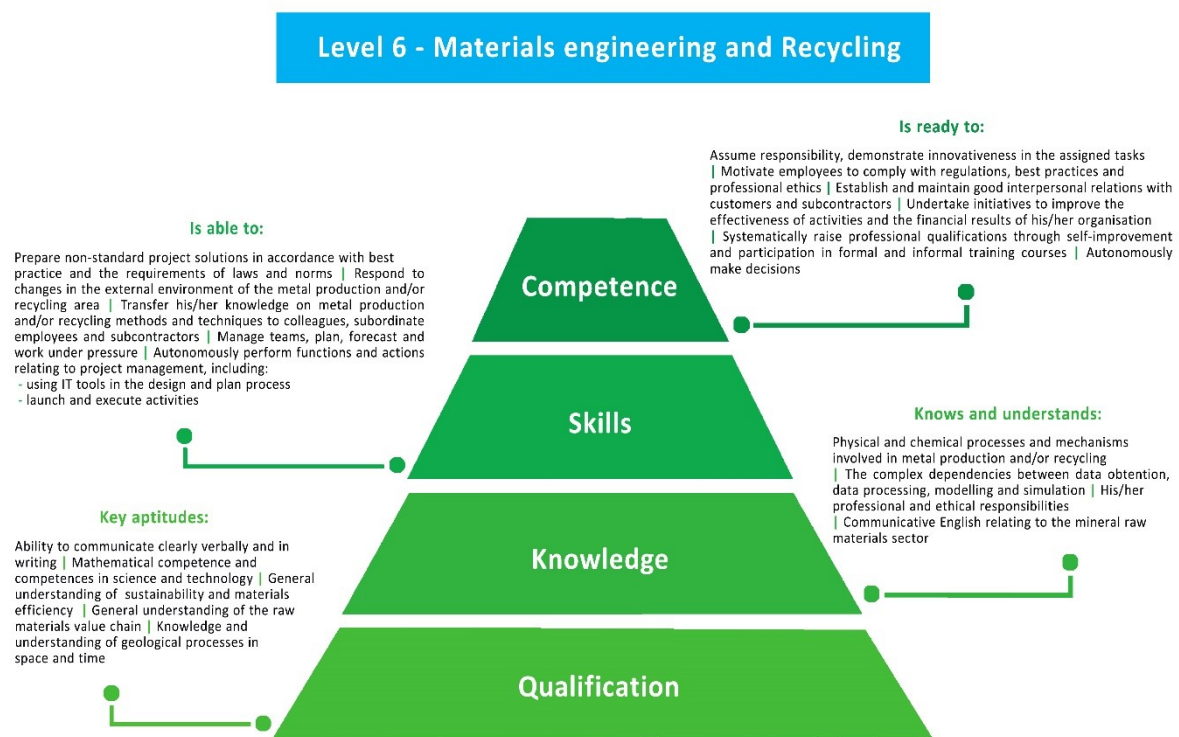
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- file and maintain technical records and documentation of metal production and/or recycling activities in a timely and consistent manner and ensure its good quality;
- comply with regulations, standards and instructions relating to metal production and/or recycling activities;
- systematically raise his/her qualifications by participating in different forms of formal and informal training (autonomous learning included).
- engage with communities, reinforcing mutual trust, respect and effective communication between his/her team and the communities affected by metal production and/or recycling works.

The holder of an SQF-RM Level 5 qualification works, for the most part, in the following areas:

- Metals' sorting and scrapping;
- Recycling;
- Smelting.

Example of a position requiring qualifications at this level: Foreman; Operations Planner; Tracking Coordinator; Welder; Mechanic; Electrician; Senior Laboratory Technician.



Annex - Fig 4::Graphical representation of Level 6 Materials Handling and Recycling.

Level 6 – Materials engineering and Recycling
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>Physical and chemical processes and mechanisms involved in metal production and/or recycling;</li> <li>the complex dependencies between data obtention, data processing, modelling and simulation;</li> <li>his/her professional and ethical responsibilities;</li> <li>communicative English relating to the mineral raw materials sector.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>prepare non-standard project solutions in accordance with best practice and the requirements of laws and norms;</li> <li>respond to changes in the external environment of the metal production and/or recycling area;</li> <li>transfer his/her knowledge on metal production and/or recycling methods and techniques to colleagues, subordinate employees and subcontractors;</li> <li>manage teams, plan, forecast and work under pressure;</li> <li>autonomously perform functions and actions relating to project management, including: <ul style="list-style-type: none"> <li>using IT tools in the design and plan process,</li> <li>launch and execute activities.</li> </ul> </li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>assume responsibility, demonstrate innovativeness in the assigned tasks;</li> <li>motivate employees to comply with regulations, best practices and professional ethics;</li> <li>establish and maintain good interpersonal relations with customers and subcontractors;</li> </ul>



- undertake initiatives to improve the effectiveness of activities and the financial results of his/her organisation;
- systematically raise professional qualifications through self-improvement and participation in formal and informal training courses;
- autonomously make decisions.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the principles of site and property management, and the corresponding environmental and social obligations;
- the specialised requirements in metal production and/or recycling relating to the applied methods, technologies and standards.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform technical functions in metal production and/or recycling, including:
  - supervising smelter operations and/or recycling works;
  - validating smelter/recycling operations;
- coordinate, monitor and validate the work of subcontractors engaged in project implementation;
- identify and select new subcontractors;
- obtain and manage new work orders.

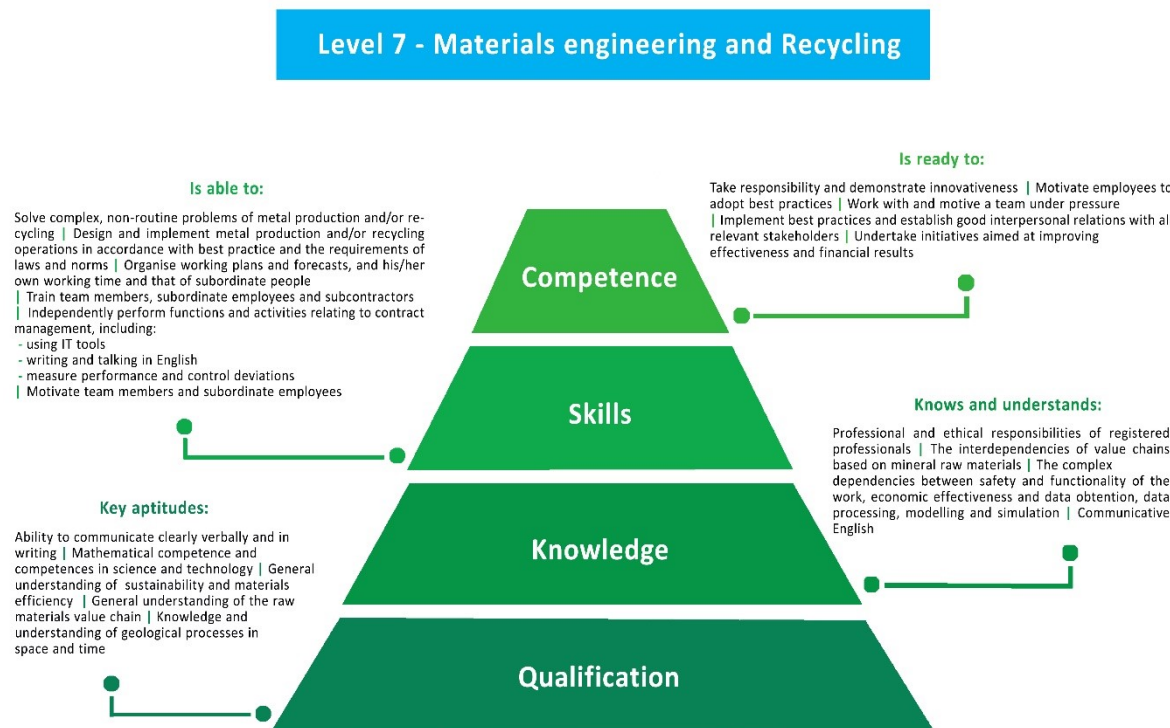
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility and demonstrate innovativeness in the design and implementation of smelter operations and/or recycling activities;
- apply the legal provisions related to smelter operations and/or recycling recommendations and best practices;
- seeking, listening to and considering community feedback that may be useful in his/her decision-making process;
- assume responsibility for the proper implementation of projects.

The holder of an SQF-RM Level 6 qualification works, for the most part, in the following areas:

- Recycling;
- Smelting.

Example of a position requiring qualifications at this level: Metallurgical Engineer; Materials Engineer; Health & Safety Manager; Recycling Centre Manager.



Annex - Fig 5: Graphical representation of Level 7 Materials Handling and Recycling.

Level 7 – Materials engineering and Recycling
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>• professional and ethical responsibilities of registered professionals;</li> <li>• the interdependencies of value chains based on mineral raw materials;</li> <li>• the complex dependencies between safety and functionality of the work, economic effectiveness and data obtention, data processing, modelling and simulation;</li> <li>• communicative English.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>• solve complex, non-routine problems of metal production and/or recycling;</li> <li>• design and implement metal production and/or recycling operations in accordance with best practice and the requirements of laws and norms;</li> <li>• organise working plans and forecasts, and his/her own working time and that of subordinate people;</li> <li>• train team members, subordinate employees and subcontractors;</li> <li>• independently perform functions and activities relating to contract management, including: <ul style="list-style-type: none"> <li>○ using IT tools,</li> <li>○ writing and talking in English;</li> <li>○ measure performance and control deviations;</li> </ul> </li> <li>• motivate team members and subordinate employees.</li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>• take responsibility and demonstrate innovativeness;</li> <li>• motivate employees to adopt best practices;</li> </ul>

- work with and motivate a team under pressure;
- implement best practices and establish good interpersonal relations with all relevant stakeholders;
- undertake initiatives aimed at improving effectiveness and financial results.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the regulations applicable to metal production and/or recycling activities;
- the specific norms and requirements of site and property management applicable in the scope of metal production and/or recycling, and the corresponding environmental and social obligations.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- combining different methods and technologies of metal production and/or recycling activities, in a manner consistent with budget and client's goals and requirements;
- manages, controls and assesses metal production and/or recycling activities;
- prepare reports on metal production and/or recycling in a manner consistent with existing reporting codes and norms.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- manage metal production and/or recycling activities;
- organise the participation of persons with relevant knowledge, qualifications and competence in preparing contracts;
- fully use his/her specialised knowledge and skills in the design, implementation and follow up of metal production and/or recycling activities;
- assume responsibility for metal production and/or recycling activities;
- properly assess opportunities and counteract threats in the implementation of metal production and/or recycling activities.

The holder of an SQF-RM Level 7 qualification works, for the most part, in the following areas:

- Recycling;
- Smelting.

Example of a position requiring qualifications at this level: Senior Metallurgical Engineer; Senior Materials Engineer, Environmental Coordinator; Recycling Centre Coordinator, Smelting Inspector.

# Mineral exploration



Annex - Fig 6: Graphical representation of Level 4 Mineral Exploration

Level 4 – Mineral Exploration
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>the basic conditions and dependencies in the structure and activities of the organisation, and the connections to the works being carried out;</li> <li>the basic principles of safety relating to the occupation and field work;</li> <li>the principles of teamwork.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>effectively motivate colleagues and subordinate employees;</li> <li>use technical documentation;</li> <li>improve his/her work performance by analysing observed errors, irregularities;</li> <li>work under pressure, alone and in a team;</li> <li>organise his/her own working time;</li> <li>plan and forecast activities;</li> <li>solve problems influencing the scope, quality or timeliness of the tasks being carried out;</li> <li>comply with organisational rules and confidentiality requirements;</li> <li>apply occupational health &amp; safety and employment regulations.</li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p>

- direct colleagues and subordinate employees so that they act according to laws, regulations, best practices and professional ethics;
- systematically raise professional qualifications through self-improvement, participation in on-the-job demonstrations, training courses and industry fairs;
- exercise self-management within the guidelines of work context;
- supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the guiding principles for geoscientific investigations, and the Principles of Geology;
- elementary geometry, algebra and trigonometry;
- principles of mapping and navigation and use of global positioning systems and equipment;
- the raw materials value chain and the core principles of sustainability;
- health and safety requirements within the scope of assigned tasks;
- the rules and procedures of quality assurance/quality control systems;
- the provisions and standards in force in mineral exploration.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- use office software (spreadsheet, word processing, email) and IT equipment to organise and report activities;
- perform assigned tasks in mineral exploration programmes effectively, promptly and in compliance with relevant regulations;
- implement and advance initiatives aiming to safeguard environmental values and ecological services, save energy and water, and manage waste according to best practice;
- assign tasks to subordinate employees diligently and proactively and enforce their timely and suitable performance;
- cooperate with subcontractors;
- plan for and notify of needed materials and tools.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility for assigned tasks in mineral exploration programmes, in compliance with applicable standards and best practice;
- observe and enforce occupational health and safety regulations;
- keep materials and equipment in a good state of repair and cleanliness;
- establish and maintain good interpersonal relations with local communities, customers, subordinate employees and subcontractors.

The holder of an SQF-RM Level 4 qualification works, for the most part, in the following areas:

- Geophysical or geochemical exploration programmes;
- Exploration drilling;
- Rock sampling;
- Laboratory testing.

Example positions requiring qualifications at this level: Field Assistant; Driller; Driller Assistant; Laboratory Technician; Core Technician; Land Surveyor.



Annex - Fig 7: Graphical representation of Level 5 Mineral Exploration

Level 5 – Mineral Exploration
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the legal provisions relating to mineral exploration;</li> <li>the methods and dependencies relating to the development and execution of mineral exploration programmes;</li> <li>the application of methods and techniques used in mineral exploration programmes.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>implement good practice in handling technical documentation;</li> <li>learn autonomously from textbooks and multimedia tools, and engages in learning discussions in training courses, workshops, fairs, etc.;</li> <li>think analytically, work under time pressure, work in a group, organise his/her own working time.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>perform tasks in a responsive, accurate and timely manner;</li> <li>establish and maintain good interpersonal relations and undertake initiatives to improve and increase the effectiveness of the tasks being carried out;</li> <li>train and develop subordinate employees and subcontractors;</li> <li>perform work with accuracy, thoroughness and under the pressure of time.</li> </ul>
<b>OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>geological cross sections and maps;</li> <li>the grounds of mineral exploration methods;</li> </ul>

- the factors that affect the outcome of mineral exploration programmes;
- the legal provisions relating to mineral exploration programmes and the minerals industry;
- environmental and social best practice in the implementation of mineral exploration activities;
- occupational health and safety regulations applicable to mineral exploration.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform tasks following the standard procedures of mineral exploration methods and techniques;
- use IT equipment and mineral exploration design and documentation software;
- develop and update the technical (e.g. activity planning) and economic outline (e.g. budget) of mineral exploration activities.

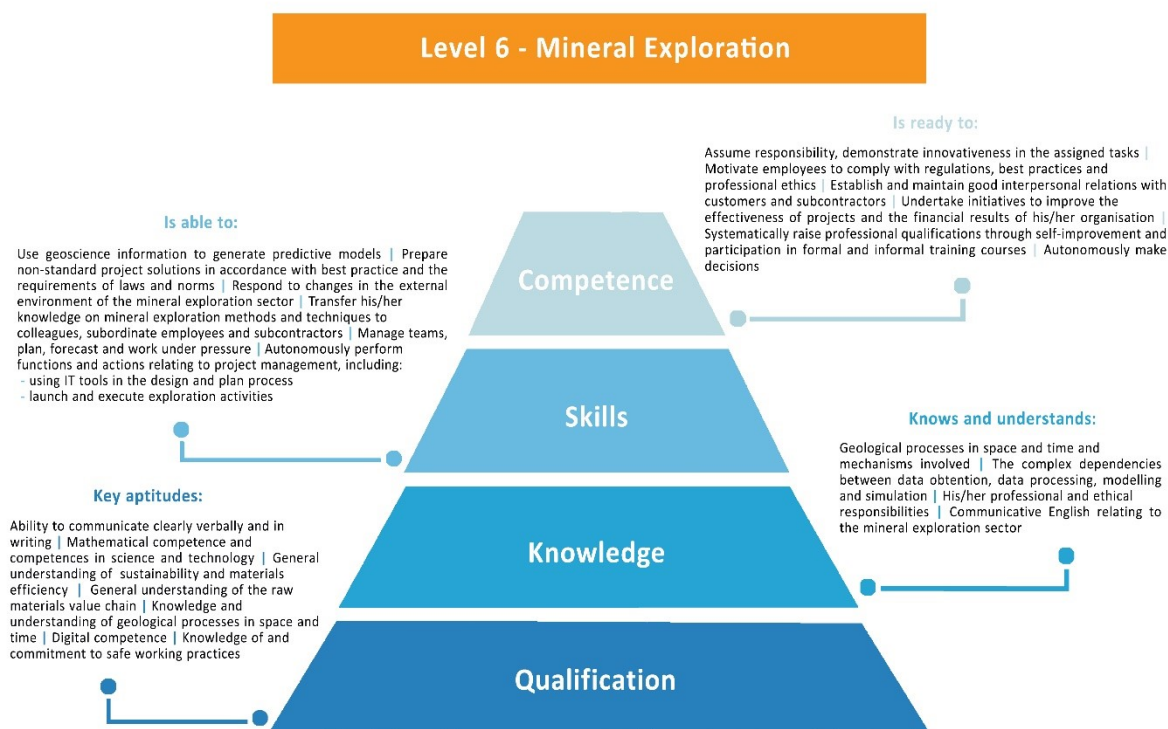
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- file and maintain technical records and documentation of mineral exploration activities in a timely and consistent manner and ensure its good quality;
- comply with regulations, standards and instructions relating to mineral exploration activities;
- systematically raise his/her qualifications by participating in different forms of formal and informal training (autonomous learning included).
- engage with communities, reinforcing mutual trust, respect and effective communication between his/her team and the communities affected by mineral exploration works.

The holder of an SQF-RM Level 5 qualification works, for the most part, in the following areas:

- Geophysical or geochemical exploration programmes;
- Exploration drilling;
- Laboratory testing;
- Classification and evaluation of mineral deposits.

Example of a position requiring qualifications at this level: Drilling Supervisor; Foreman; Senior Laboratory Technician; Operations Planner; Permitting Manager.



Annex - Fig 8: Graphical representation of Level 6 Mineral Exploration

Level 6 – Mineral Exploration
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>• geological processes in space and time and mechanisms involved;</li> <li>• the complex dependencies between data obtention, data processing, modelling and simulation;</li> <li>• his/her professional and ethical responsibilities;</li> <li>• communicative English relating to the mineral exploration sector.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>• use geoscience information to generate predictive models;</li> <li>• prepare non-standard project solutions in accordance with best practice and the requirements of laws and norms;</li> <li>• respond to changes in the external environment of the mineral exploration sector;</li> <li>• transfer his/her knowledge on mineral exploration methods and techniques to colleagues, subordinate employees and subcontractors;</li> <li>• manage teams, plan, forecast and work under pressure;</li> <li>• autonomously perform functions and actions relating to project management, including: <ul style="list-style-type: none"> <li>○ using IT tools in the design and plan process,</li> <li>○ launch and execute exploration activities.</li> </ul> </li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>• assume responsibility, demonstrate innovativeness in the assigned tasks;</li> <li>• motivate employees to comply with regulations, best practices and professional ethics;</li> <li>• establish and maintain good interpersonal relations with customers and subcontractors;</li> </ul>



- undertake initiatives to improve the effectiveness of projects and the financial results of his/her organisation;
- systematically raise professional qualifications through self-improvement and participation in formal and informal training courses;
- autonomously make decisions.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the principles of the investment process, including the rights and obligations of its participants;
- the principles of site and property management, and the corresponding environmental and social obligations;
- the specialised requirements in mineral exploration relating to the applied methods, technologies and standards.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform technical functions in mineral exploration, including:
  - designing and supervising exploration works;
  - validating the design of exploration programmes;
- coordinate, monitor and validate the work of subcontractors engaged in project implementation;
- identify and select new subcontractors;
- obtain and manage new work orders.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility and demonstrate innovativeness in the design and implementation of mineral exploration programmes;
- apply the legal provisions related to mineral exploration and industry recommendations and best practices;
- seeking, listening to and considering community feedback that may be useful in his/her decision-making process;
- assume responsibility for the proper implementation of projects.

The holder of an SQF-RM Level 6 qualification works, for the most part, in the following areas:

- Geophysical or geochemical exploration programmes;
- Exploration drilling;
- Laboratory testing;
- Classification and evaluation of mineral deposits.

Example of a position requiring qualifications at this level: Geophysicist; Exploration Geologist; Project Manager; Geotechnical Engineer; Geospatial Analyst; Mine Engineer.



Annex - Fig 9: Graphical representation of Level 7 Mineral Exploration

Level 7 – Mineral Exploration
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>• professional and ethical responsibilities of professional geoscientists;</li> <li>• the interdependencies of value chains based on mineral raw materials;</li> <li>• the complex dependencies between economic effectiveness and data obtention, processing, modelling and simulation;</li> <li>• the complex dependencies between safety and functionality of the work, economic effectiveness and data obtention, data processing, modelling and simulation;</li> <li>• communicative English.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>• solve complex, non-routine problems of mineral exploration programmes;</li> <li>• design unique mineral exploration projects in accordance with best practice and the requirements of laws and norms;</li> <li>• organise working plans and forecasts, and his/her own working time and that of subordinate people;</li> <li>• train team members, subordinate employees and subcontractors;</li> <li>• independently perform functions and activities relating to contract management, including: <ul style="list-style-type: none"> <li>○ using IT tools,</li> <li>○ writing and talking in English;</li> <li>○ measure performance and control deviations;</li> </ul> </li> <li>• motivate team members and subordinate employees.</li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>• take responsibility and demonstrate innovativeness;</li> </ul>

- motivate employees to adopt best practices;
- work with and motivate a team under pressure;
- implement best practices and establish good interpersonal relations with all relevant stakeholders;
- undertake initiatives aimed at improving effectiveness and financial results.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the provisions of exploration contracts, including the rights and obligations of its participants;
- in depth, the regulations applicable to mineral exploration programmes;
- the specific norms and requirements of site and property management applicable in the scope of a contract, and the corresponding environmental and social obligations;
- the application of methods and techniques of mineral exploration to improve the processes of mineral extraction and processing.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- design mineral exploration programmes, using different methods and technologies in a manner consistent with budget and client's goals and requirements;
- manages, controls and assesses the implementation of exploration programmes;
- prepare reports of mineral exploration programmes in a manner consistent with existing reporting codes and norms;
- prepare mineral exploration contracts and the corresponding technical documentation.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

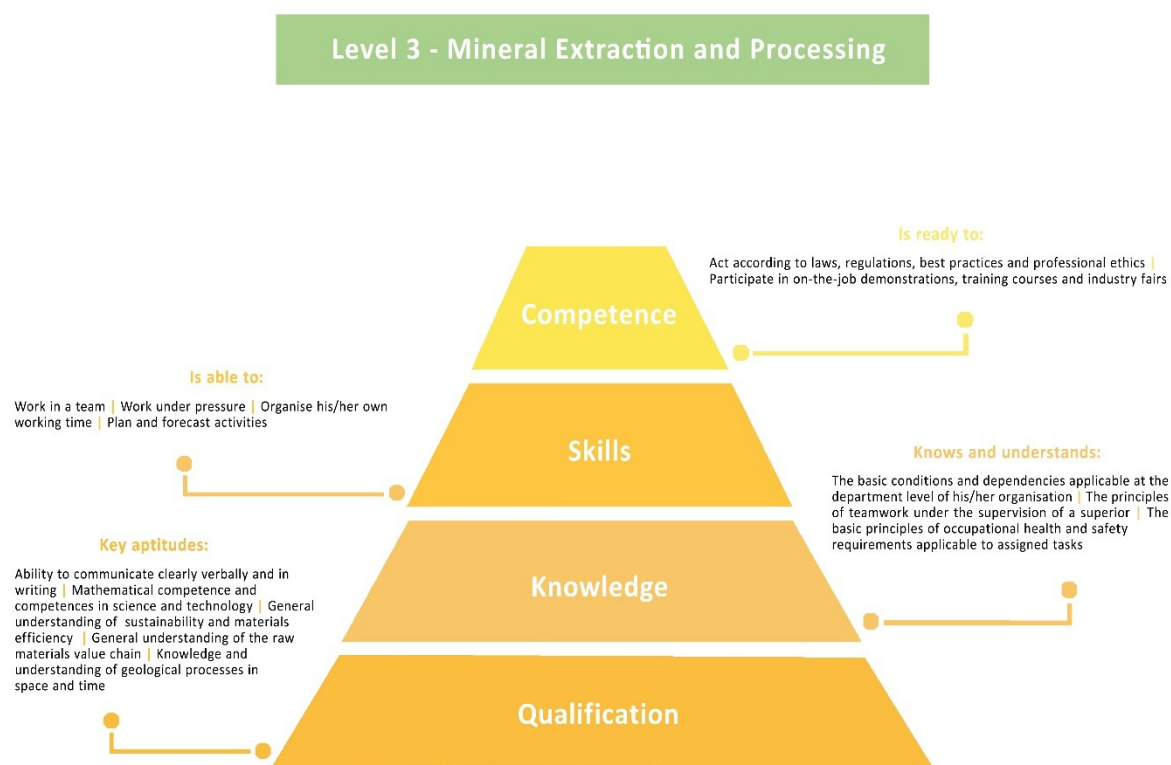
- design and manage mineral exploration programmes;
- organise the participation of persons with relevant knowledge, qualifications and competence in preparing contracts;
- fully use his/her specialised knowledge and skills in the design, implementation and follow up of exploration programmes;
- assume responsibility for mineral exploration programmes;
- properly assess opportunities and counteract threats in the implementation of exploration programmes.

The holder of an SQF-RM Level 7 qualification works, for the most part, in the following areas:

- Geophysical or geochemical exploration programmes;
- Exploration drilling;
- Laboratory testing;
- Classification and evaluation of mineral deposits.

Example of a position requiring qualifications at this level: Senior Exploration Geologist; Senior Project Manager; Mineral Potential Supervisor; Geologists Supervisor.

# Mineral extraction and processing



Annex - Fig 10: Graphical representation of Level 3 Mineral Extraction and Processing

Level 3 – Mineral Extraction and Processing
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the basic conditions and dependencies applicable at the department level of his/her organisation;</li> <li>the principles of teamwork under the supervision of a superior;</li> <li>the basic principles of occupational health and safety requirements applicable to assigned tasks.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>work in a team;</li> <li>work under pressure;</li> <li>organise his/her own working time;</li> <li>plan and forecast activities.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>act according to laws, regulations, best practices and professional ethics;</li> <li>participate in on-the-job demonstrations, training courses and industry fairs.</li> </ul>
<b>OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>basic principles of mineral extraction and processing;</li> <li>elementary geology and arithmetic;</li> <li>the basic principles of sustainability;</li> <li>the concept of raw materials value chain;</li> </ul>

- safety principles within the scope of assigned tasks.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- work without risk or harm to self and others;
- perform assigned tasks in mineral extraction and processing operations, in due time and compliance with relevant regulations;
- use correct materials and tools;
- care for the materials and equipment used;
- plan for and notify of needed materials and tools.

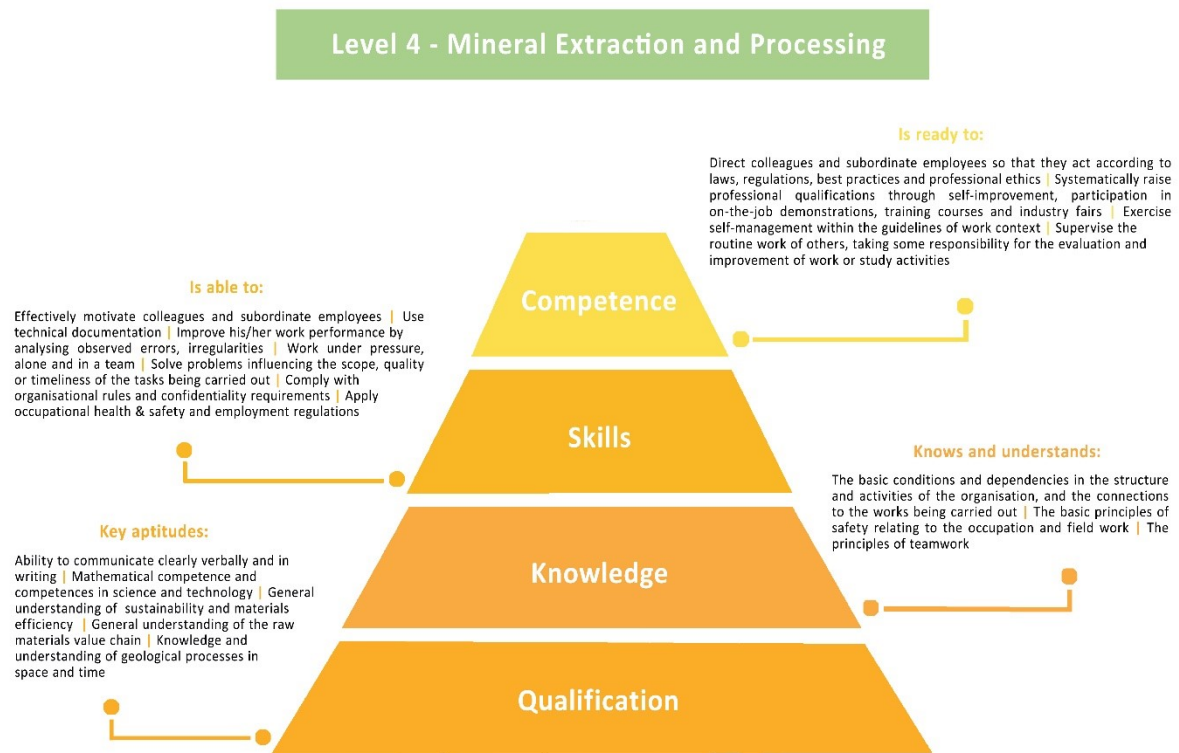
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility for assigned tasks in mineral extraction and processing operations;
- maintain good interpersonal relations with colleagues, customers and subcontractors;
- comply with work and occupational health and safety regulations applicable in mineral extraction and processing operations.

The holder of an SQF-RM Level 3 qualification works, for the most part, in the following areas:

- Mining and quarrying;
- Mineral processing;
- Mine surveying;
- Tunnelling.

Example positions requiring qualifications at this level: Process Operator; Equipment Operator Assistant; Underground Driller Helper; Mine Surveyor Assistant; General Labourer.



Annex - Fig 11: Graphical representation of Level 4 Mineral Extraction and Processing

Level 4 – Mineral Extraction and Processing
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>the basic conditions and dependencies in the structure and activities of the organisation, and the connections to the works being carried out;</li> <li>the basic principles of safety relating to the occupation and field work;</li> <li>the principles of teamwork.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>effectively motivate colleagues and subordinate employees;</li> <li>use technical documentation;</li> <li>improve his/her work performance by analysing observed errors, irregularities;</li> <li>work under pressure, alone and in a team;</li> <li>solve problems influencing the scope, quality or timeliness of the tasks being carried out;</li> <li>comply with organisational rules and confidentiality requirements;</li> <li>apply occupational health &amp; safety and employment regulations.</li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>direct colleagues and subordinate employees so that they act according to laws, regulations, best practices and professional ethics;</li> <li>systematically raise professional qualifications through self-improvement, participation in on-the-job demonstrations, training courses and industry fairs;</li> <li>exercise self-management within the guidelines of work context;</li> </ul>

- supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- elementary geometry, algebra and trigonometry;
- elementary physics and chemistry;
- elementary geology and the basics of the mining cycle;
- the raw materials value chain and the core principles of sustainability;
- health and safety requirements within the scope of assigned tasks, including mine/plant rescue operations;
- the rules and procedures of quality assurance/quality control systems;
- the provisions and standards in force in mineral extraction and processing.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- use office software (spreadsheet, word processing, email) and IT equipment to organise and report activities;
- perform assigned tasks in mineral extraction and processing effectively, promptly and in compliance with relevant regulations;
- implement and advance initiatives aiming to safeguard environmental values and ecological services, save energy and water, and manage waste according to best practice;
- assign tasks to subordinate employees diligently and proactively and enforce their timely and suitable performance;
- cooperate with subcontractors;
- plan for and notify of needed materials and tools.

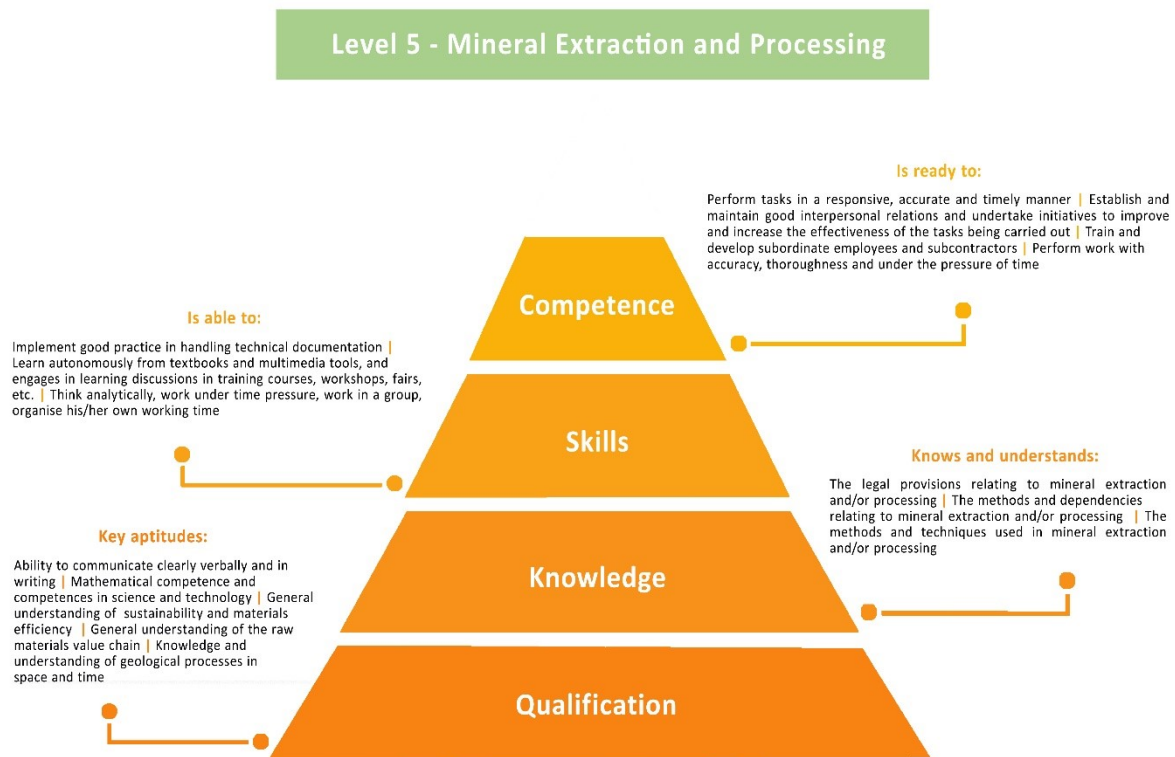
#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- assume responsibility for assigned tasks in mineral extraction and processing works, in compliance with applicable standards and best practice;
- observe and enforce occupational health and safety regulations;
- keep materials and equipment in a good state of repair and cleanliness;
- establish and maintain good interpersonal relations with subordinate employees, customers and subcontractors.

The holder of an SQF-RM Level 4 qualification works, for the most part, in the following areas:

- Mining and quarrying;
- Mineral processing;
- Mine surveying.

Example positions requiring qualifications at this level: Mine Surveyor; Blaster; Excavator/Dumper/Crusher Operator; Underground Driller; Assay Lab Technician.



Annex - Fig 12: Graphical representation of Level 5 Mineral Extraction and Processing

Level 5 – Mineral Extraction and Processing
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the legal provisions relating to mineral extraction and/or processing;</li> <li>the methods and dependencies relating to mineral extraction and/or processing;</li> <li>the methods and techniques used in mineral extraction and/or processing.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>implement good practice in handling technical documentation;</li> <li>learn autonomously from textbooks and multimedia tools, and engages in learning discussions in training courses, workshops, fairs, etc.;</li> <li>think analytically, work under time pressure, work in a group, organise his/her own working time.</li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>perform tasks in a responsive, accurate and timely manner;</li> <li>establish and maintain good interpersonal relations and undertake initiatives to improve and increase the effectiveness of the tasks being carried out;</li> <li>train and develop subordinate employees and subcontractors;</li> <li>perform work with accuracy, thoroughness and under the pressure of time.</li> </ul>
<b>OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>the grounds of mineral extraction and/or processing methods;</li> <li>the factors that affect the outcome of mineral extraction and/or processing;</li> <li>the legal provisions relating to mineral extraction and/or processing;</li> </ul>



- environmental and social best practice in the implementation of mineral extraction and/or processing activities;
- occupational health and safety regulations applicable to mineral extraction and/or processing.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform tasks following the standard procedures of mineral extraction and/or processing methods and techniques;
- use IT equipment and mineral extraction and/or processing documentation software;
- develop and update the technical (e.g. activity planning) and economic outline (e.g. budget) of mineral extraction and/or processing activities.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- file and maintain technical records and documentation of mineral extraction and/or processing activities in a timely and consistent manner and ensure its good quality;
- comply with regulations, standards and instructions relating to mineral extraction and/or processing activities;
- systematically raise his/her qualifications by participating in different forms of formal and informal training (autonomous learning included).
- engage with communities, reinforcing mutual trust, respect and effective communication between his/her team and the communities affected by mineral extraction and/or processing works.

The holder of an SQF-RM Level 5 qualification works, for the most part, in the following areas:

- Mining and quarrying;
- Mineral processing;
- Mine surveying.

Example of a position requiring qualifications at this level: Foreman; Operations Planner; Welder; Mechanic; Development Miner; Electrician; Senior Laboratory Technician.

## Level 6 - Mineral Extraction and Processing



Annex - Fig 13: Graphical representation of Level 6 Mineral Extraction and Processing

Level 6 – Mineral Extraction and Processing
<b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b> <ul style="list-style-type: none"> <li>geological processes in space and time and mechanisms involved;</li> <li>the complex dependencies between data obtention, data processing, modelling and simulation;</li> <li>his/her professional and ethical responsibilities;</li> <li>communicative English relating to the mineral raw materials sector.</li> </ul>
<b>GENERAL SKILLS – IS ABLE TO:</b> <ul style="list-style-type: none"> <li>use geoscience information to generate predictive models;</li> <li>prepare non-standard project solutions in accordance with best practice and the requirements of laws and norms;</li> <li>respond to changes in the external environment of the mineral extraction and/or processing area;</li> <li>transfer his/her knowledge on mineral extraction and/or processing methods and techniques to colleagues, subordinate employees and subcontractors;</li> <li>manage teams, plan, forecast and work under pressure;</li> <li>autonomously perform functions and actions relating to project management, including:               <ul style="list-style-type: none"> <li>using IT tools in the design and plan process,</li> <li>launch and execute activities.</li> </ul> </li> </ul>
<b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b> <ul style="list-style-type: none"> <li>assume responsibility, demonstrate innovativeness in the assigned tasks;</li> <li>motivate employees to comply with regulations, best practices and professional ethics;</li> <li>establish and maintain good interpersonal relations with customers and subcontractors;</li> </ul>

- undertake initiatives to improve the effectiveness of activities and the financial results of his/her organisation;
- systematically raise professional qualifications through self-improvement and participation in formal and informal training courses;
- autonomously make decisions.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the principles of site and property management, and the corresponding environmental and social obligations;
- the specialised requirements in mineral extraction and/or processing relating to the applied methods, technologies and standards.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- autonomously perform technical functions in mineral extraction and/or processing, including:
  - designing and supervising mining works;
  - validating the design of mining plans / mineral processing operations;
- coordinate, monitor and validate the work of subcontractors engaged in project implementation;
- identify and select new subcontractors;
- obtain and manage new work orders.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

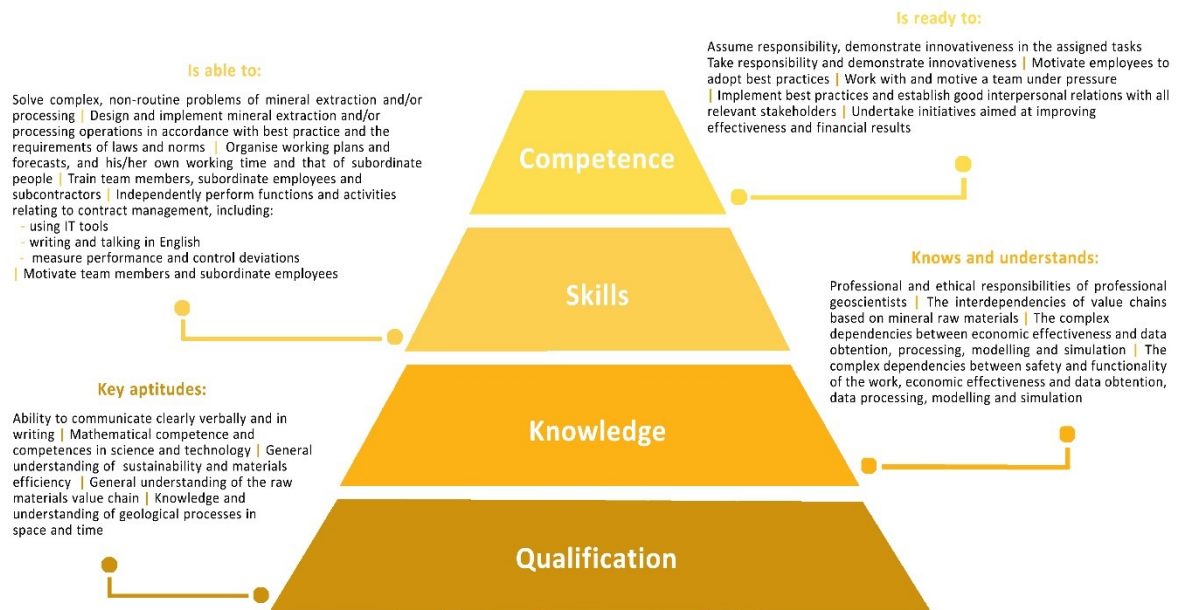
- assume responsibility and demonstrate innovativeness in the design and implementation of extraction/mineral processing activities;
- apply the legal provisions related to mineral extraction and/or processing recommendations and best practices;
- seeking, listening to and considering community feedback that may be useful in his/her decision-making process;
- assume responsibility for the proper implementation of projects.

The holder of an SQF-RM Level 6 qualification works, for the most part, in the following areas:

- Mining and quarrying;
- Mineral processing;
- Mine surveying.

Example of a position requiring qualifications at this level: Mine Geologist; Mine Engineer; Geotechnical Engineer; Metallurgical Engineer; Health & Safety Manager.

## Level 7 - Mineral Extraction and Processing



Annex - Fig 14: Graphical representation of Level 7 Mineral Extraction and Processing

Level 7 – Mineral Extraction and Processing
<p><b>GENERAL KNOWLEDGE – KNOWS AND UNDERSTANDS:</b></p> <ul style="list-style-type: none"> <li>professional and ethical responsibilities of professional geoscientists;</li> <li>the interdependencies of value chains based on mineral raw materials;</li> <li>the complex dependencies between economic effectiveness and data obtention, processing, modelling and simulation;</li> <li>the complex dependencies between safety and functionality of the work, economic effectiveness and data obtention, data processing, modelling and simulation;</li> <li>communicative English.</li> </ul>
<p><b>GENERAL SKILLS – IS ABLE TO:</b></p> <ul style="list-style-type: none"> <li>solve complex, non-routine problems of mineral extraction and/or processing;</li> <li>design and implement mineral extraction and/or processing operations in accordance with best practice and the requirements of laws and norms;</li> <li>organise working plans and forecasts, and his/her own working time and that of subordinate people;</li> <li>train team members, subordinate employees and subcontractors;</li> <li>independently perform functions and activities relating to contract management, including: <ul style="list-style-type: none"> <li>using IT tools,</li> <li>writing and talking in English;</li> <li>measure performance and control deviations;</li> </ul> </li> <li>motivate team members and subordinate employees.</li> </ul>
<p><b>GENERAL SOCIAL COMPETENCE – IS READY TO:</b></p> <ul style="list-style-type: none"> <li>take responsibility and demonstrate innovativeness;</li> </ul>

- motivate employees to adopt best practices;
- work with and motivate a team under pressure;
- implement best practices and establish good interpersonal relations with all relevant stakeholders;
- undertake initiatives aimed at improving effectiveness and financial results.

#### OCCUPATIONAL KNOWLEDGE – KNOWS AND UNDERSTANDS:

- the provisions of mining contracts, including the rights and obligations of its participants;
- the regulations applicable to mineral extraction and/or processing activities;
- the specific norms and requirements of site and property management applicable in the scope of a mining contract, and the corresponding environmental and social obligations.

#### OCCUPATIONAL SKILLS – IS ABLE TO:

- combining different methods and technologies of plan mineral extraction and/or processing activities, in a manner consistent with budget and client's goals and requirements;
- manages, controls and assesses mineral extraction and/or processing activities;
- prepare reports on mineral extraction and/or processing in a manner consistent with existing reporting codes and norms.

#### OCCUPATIONAL SOCIAL COMPETENCE – IS READY TO:

- manage mineral extraction and/or processing activities;
- organise the participation of persons with relevant knowledge, qualifications and competence in preparing contracts;
- fully use his/her specialised knowledge and skills in the design, implementation and follow up of mineral extraction and/or processing activities;
- assume responsibility for mineral extraction and/or processing activities;
- properly assess opportunities and counteract threats in the implementation of mineral extraction and/or processing activities.

The holder of an SQF-RM Level 7 qualification works, for the most part, in the following areas:

- Geophysical or geochemical exploration programmes;
- Classification and evaluation of mineral deposits.
- Mining and quarrying;
- Mineral processing;
- Management.

Example of a position requiring qualifications at this level: Senior Mine Geologist; Senior Mine Engineer, Environmental Coordinator; Metallurgical Engineer; Mine/Quarry Manager.