Background Information

Uranium

Uranium is a commonly occurring element throughout the world. For example, the average uranium content of granite is approximately 4 ppm (parts per million) and seawater contains approximately 4 ppb (parts per billion) of uranium. In the Talvivaara area, the estimated uranium content of the bedrock is approximately 15–20 ppm. The highest uranium grades, of around 20 %, have been discovered in Canada and are approximately 10,000 times higher than those present in the Talvivaara area.

Naturally occurring uranium is composed of three major isotopes. Over 99 % of uranium is isotope uranium-238 which is not strongly radiating. Natural occurring uranium also contains isotopes uranium-235 and uranium-234. Uranium-235 is capable of spontaneous fission, which releases energy that can be utilised, for example in nuclear power plants.

The proportion of uranium-238 and uranium-235 isotopes does not change during yellow cake production; therefore yellow cake is not strongly radiating. Nuclear fuel is produced by converting and enriching yellow cake into nuclear fuel. After enrichment, the product contains approximately 3-4%uranium-235 isotope.

In Finland, background radiation varies between 0.05–0.30 microsieverts per hour (µSv/h) (Radiation and Nuclear Safety Authority, STUK). Regional variation depends on the differences in uranium concentration in Finnish rock and soil. Snow and ice attenuate the radiation from the ground. According to radiation measurements conducted by the Geological Survey of Finland in the Talvivaara mine area, background radiation varies between 0.04–0, 21 µSv/h.

Talvivaara

- Talvivaara focuses on nickel and zinc production and is ramping up to become one of the world's leading nickel producers. Uranium is only a by-product of its production process.
- During Talvivaara's main product leaching process, small quantities of uranium leach into the process solution; Talvivaara's current production process takes this into account.
- Talvivaara's own research has outlined a method which will enable it to commercially exploit uranium.

- The handling of uranium at Talvivaara will be safe. Production will be controlled by strict national and international regulations and continuous monitoring which guarantee the safety of operations.
- Uranium production levels will be relatively small, at approximately 0.3 per cent of the mine's total production volumes.
- Talvivaara is not a uranium mine; there is no uranium ore. Small quantities of uranium leach into the process solution and our aim is to extract this product from the solution.
- The investment involved in the project is estimated at approximately EUR 30 million. The plant is expected to employ around 20 people directly and some 50 people indirectly.
- Talvivaara will deliver yellow cake to uranium producers who can guarantee its utilization for peaceful purposes only, in accordance with current regulations.
- The production process is planned with safety as the top priority:
  - The operations will use the best available production techniques and technical expertiseUranium will be recovered using a safe and technically simple solvent extraction method
  - Process modification will not increase discharges or the environmental impact of the operations as defined in the current Environmental Permit.
  - Yellow cake will be carefully packed for transportation

Further information: www.stuk.fi

Talvivaara Mining Company Plc.

Talvivaara Mining Company aims to become an internationally significant base metals producer with its primary focus on nickel and zinc using a technology known as bioheapleaching to extract metals out of ore. Bioheapleaching makes extraction of metals from low grade ore economically viable. The Talvivaara deposits comprise one of the largest known sulphide nickel resources in Europe. The ore body is sufficient to support anticipated production for at least 46 years. Talvivaara has secured a 10-year off-take agreement for 100 per cent of its main output of nickel and cobalt to Norilsk Nickel and signed a long-term zinc streaming agreement with Nyrstar NV. Talvivaara is listed on the London Stock Exchange Main Market and NASDAQ OMX Helsinki and is included in the FTSE 250 Index. Further information can be found at www.talvivaara.com.

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