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בית הספר לבריאות הציבור ורפואה קהילתית
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Eli Harlev
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Arad

Dear Mr Harlev

I am writing to provide a preliminary statement on the open pit phosphate mine which the Government is proposing to build and operate near Arad. My background includes 35 years of research teaching and service in Israel and around the world in assessing, predicting and preventing occupational and environmental exposures to toxic hazards, and includes work on the nuclear reactor, the Kishon Disaster, community air pollution episodes in Tel Aviv, Haifa, and Jerusalem, the Tel Arad problem and many other toxic scenarios. In 2003, I published a paper describing health effects from combined exposure to particulates from construction debris and diesel emissions from transport trucks passing through Neve Yaakov.

I have published some 150 scientific papers, have served on various expert committees of WHO and have been on the editorial board of several leading journals and am a Fellow of the Collegium Ramazzini.

The following information on the site has been presented to me from Mr Harlev. In addition I have reviewed the other opinions by Bar-Chana and Duvnov and Kislev, and the Syrian paper:

- a. The site is some 3.5 km from residential areas in Arad
- b. it is some 13 km²,
- c. It is designated to operate some 30 y.
- d. Some 40,000 t will be extracted and moved per day.
- e. The open pit work will include explosions –which can be expected to result in substantial dispersion of aerosols of phosphate particulates of varying diameters over a substantial distance.
- f. Furthermore, my own prediction is that there will be additional dispersion of aerosols of particulates associated with transport and shipment of phosphates from the open pit, as well as diesel emissions from truck transport. (See below) There will be exposures to noise and other pollutants as well from this traffic.

The data from the Syrian phosphate mine present the evidence for far dispersion of aerosols from sites such as the one considered for Arad. This paper provides an overwhelming degree of documentation based on which we can expect widespread regional contamination produced by the Barir mine.

I totally agree with Drs Bar Hana and Dubnov regarding the risks for increased morbidity and mortality for respiratory and cardiovascular disease from the exposures we can anticipate to be produced by the site.

But since we are dealing with phosphate particulates, there will be exposure to its radiation breakdown products, not only from radon gas, but from the direct contact of these particulates and point release of alpha radiation to tissues in the upper and lower airways, and via ingestion into the G-I tract. . For children there will be additional exposures from crawl-hand-mouth route. There is reason to believe that

we will be dealing with a situation somewhat similar to what has happened in the military base in Tel Arad where there have been increased risks for nasopharyngeal cancer and other cancers on the basis of mechanisms which I have described in a havat daat for a bagatz, and in Port Ashdod, where there was a cancer cluster from heavy occupational exposures to phosphates in the hangar. Although the community concentrations can be expected to be lower, they will be round the clock and involve the entire population including the young and those with preexisting illness. In phosphate rich areas in China, community exposures to aerosols have been suggested to produce increased risks for Nasopharyngeal carcinoma and other cancers.

The weight of the preliminary evidence points to the production of a non-trivial set of health risks for the population of Arad from the operation of the Barir mine and related activities in transportation and shipping. I concur with Bar Hana and Dubnov, but at this stage cannot provide a quantitative assessment of the increases in risks, although I believe they may be greater than those calculated, given the problems with childhood exposure.

The burden of proof is on those claiming that the mine will not produce these risks. I would also like to know if the risk projections take into account the impact of the mine on property values---an extremely sensitive index of health perceptions and the impact on activities such as tourism. In short my preliminary impression is that the proposal seems to be a reckless one, especially in the light of the emerging picture of risks from phosphates in the Tel Arad Nahal base.

Should the need arise I will be happy to expand this preliminary havat daat.

Sincerely
Professor Elihu D Richter MD MPH