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## The Silent Killer is gone

Continuous work lasted for six years and cost 10.6 million Euro. The "war" against the tailing mine impoundment (TMI) was initiated by environmentalists and led by state

MOJKOVAC - The remediation of the tailing mine impoundment (TMI) of the former lead and zinc mine "Brskovo" has been completed. On this occasion, the local authorities prepare a celebration on Tuesday. Prime Minister Igor Luksic will also be present at the event, it was announced.

He will officially put an end to a multi-year story of "the Silent Killer" as the citizens of Mojkovac with reason gave the name to the tailing, which is just a hundred meters away from the town centre, leaning on the coast of the clear Tara river.


It will be a special day for the citizens of Mojkovac, not so much because of the celebration and a special guest, but because of the final destruction of the tailing, which was called for by all the people, from the bottom of their hearts, while it was taking their health for years, and even their lives.

Approximately 2.5 million cubic meters of flotation sludge, a mixture of heavy metals, chemicals, carcinogenic substances and toxins led by cyanide, this dangerous mix, covered by a swamp-like, stinking lake, filled by the rain and the city sewage system, no longer exists!

The citizens of Mojkovac can, finally, can be relieved and celebrate, and Prime Minister Luksic has a reason to join them - the tailing mine impoundment was properly "packaged", it can no longer be seen and it is no longer considered a threat, Zarko Zivkovic, Director of the Directorate of Public Works of Montenegro, which was working on its remediation said.

- One of the largest environmental problems in Montenegro has been solved. I am extremely satisfied with the quality of the work done. The tailing mine impoundment does not represent any threat, primarily to human health, or environment, especially the Tara river – Zivkovic said.

During 2002 an intensive campaign "For a Life without Tailing", was led by the Ecological



Society "Ekoturs" and supported by the UN Development Programme (UNDP), which initiated a "war" against the unpleasant and dangerous legacy of the Brskovo mine. It lasted for six years, and it was run by the state.

- Taking into account the danger represented by the tailing , which was designated as the culprit for the increased number of cancer and respiratory diseases in Mojkovac, the Government recognized the environmental remediation of this project as a priority, and with donor support it provided the required 10.6 million Euro. Civil Engineering Faculty from Podgorica made in 2003 the project documentation and this is when, in fact, it all began – Zivkovic remembers.

The real "battle" began, however, by stepping out on the field in the summer of 2005. During this and the following year collectors of rainwater and sewage waters were built. During the next two years a municipal wastewater treatment plant was built. Mojkovac has this way become the first town in Montenegro to solve the wastewater problem in a quality way. All this was, however, only preparing the ground for the "final battle".


- By building the plants, conditions were first created for drying the tailing, and later for its remediation. Before that, the tailing was inaccessible because of all the water, and the water was part of the problem – Zivkovic said.

The key and the hardest part of the work was solidification of 500,000 cubic meters of sludge, which formed a sturdy, waterproof layer and sealed the toxic waste in the tailing, was made by since the end of 2008 until the summer of 2010. The work was entrusted to the Czech company "Vodni zdroje" and the company also hired contractors for a part of the work.

- It was extremely difficult and dangerous. None of us had previously worked on a similar ground. It often happened that a machine, almost all of it, suddenly sinks into soft mud. At this stage, any movement of machinery on the tailing brought a dose of risk, so we literally had to carefully plan and secure our every step. This is how we managed to avoid dangerous situations – owner of the contractor company "North" Ranko Mišnić says.

The final phase of remediation, the construction of the drainage layer made of the gravel from Tara River, and putting a meter layer of soil, began late last year. "Bemaks" company from Podgorica finished the job. It remains only for the Prime Minister Luksic to formalize it on Tuesday.

- We have done a very important and a vast job. Tailing represents no threat for anybody or anything and Mojkovac has got 19 acres of space which can be used for development projects. I repeat, I am very satisfied with what has been done, under the supervision of experts of the Directorate and the



"Construction supervision and laboratory testing" company from Podgorica. I believe that citizens of Mojkovac are also satisfied – Zivkovic said.

#### Funds and constructors

Remediation of the tailing cost 10.6 million. The Government of Montenegro has committed, through the capital budget, 8.5 million, the Government of the Czech Republic 910,000 and the Government of the Netherlands 1,190,000 Euro through the UNDP Regional Programme of remediation of priority environmental "hot spots" in the Western Balkans.

Four companies were engaged as contractors on the remediation. "Cijevna komerc" worked on wastewater and rainwater collectors, "YU BRIV" from Kotor built a plant for wastewater treatment, the Czech company "Vodni zdroje" conducted the mud solidification, and "Bemaks" finished with putting on a drainage and soil layer.

#### Material used

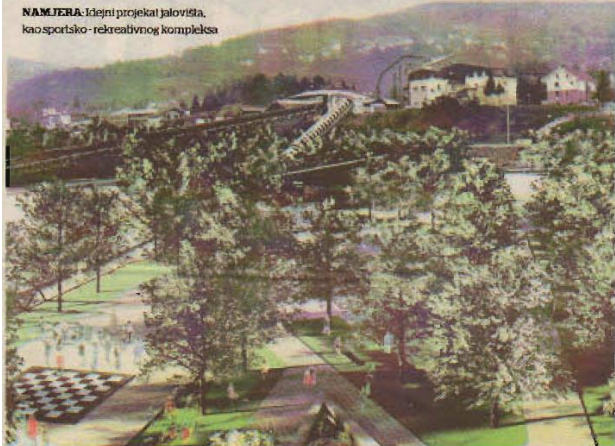
Remediation of the tailing spent, among other things, 6,000 cubic meters of concrete and 6,000 square meters of asphalt. 500,000 cubic meters of mud went through the process of solidification, i.e. it was mixed with lime, 200,000 cubic meters of soil was used, 60,000 cubic meters of gravel from the Tara River, 4,300 meters of sewage pipes of various profiles and 800 meters of water pipes. The plant for wastewater treatment was built, for the town of 5,200 inhabitants.

#### Sports and recreational area

The citizens of Mojkovac intend to use the former tailing as a sports and recreational area, attractive also for tourists. Parks, walking paths, lawns, courts for sports such as tennis and football, ice skating rink, even a sledding slope could be found on those 19 acres, among other things. This is just a taste of what that the architect Rifat Alihodžić had in mind in its conceptual design, which won the first prize in an international competition.

"We hope that the remediation of the tailing and its transformation into a sports-recreational tourism zone, will turn an environmental threat into a development opportunity," one of the organizers of the competition, Alexander Avanesov, UN Resident Coordinator said at the presentation of the Alihodžić's conceptual design in Podgorica on 24 February last year .

**NAMJERA:** Idejni projekat jalovišta, kao sportsko-rekreativnog kompleksa



Jakovšće prijetisnacije



Premijer Lukšić u utorak će ozvaničiti završetak sanacije jalovišta

## „Tih ubica grada“ više ne postoji

Radovi, u kontinuitetu, trajali šest godina i koštali 10,6 miliona eura. „Rat“ protiv jalovišta inicirali ekolozi, a vodila ga država

Piše **Ranko Četković**

**MOJKOVAC** – Završena je sanacija flotacijskog jalovišta bivšeg mojkovačkog rudnika olova i cinka „Brskovo“. Lokalne vlasti pripremaju, tim povodom, za utorak, prigodnu svečanost. Doći će, kako je najavljeno, i predsjednik Vlade Igor Lukšić.

On će, zvanično, staviti tačku na višegodišnju priču o „tihom ubici grada“, kako su Mojkovčani, s razlogom, nazvali tu deponiju, samo stotinak metara udaljenu od centra grada, naslonjenu na obalu bistre Tare.

Biće to za Mojkovčane poseban dan, ne toliko zbog same svečanosti i prisustva visokog gosta, koliko radi konačnog umišenja jalovišta, što su mu svi, od sreća, željeli dok im je ono godinama uzimalo zdravlje, čak i živote. Oko 2,5 miliona kubika flotacijskog mulja, smjesa teških metala, hemikalija, kancerogenih supstanci i otrova na čelu s cijanim, ta opasna mješavina, prekrivena zamočvarenim, smrdljivim jezerom, što su ga punile kike iz gradske kanalizacije, više ne postoji!

Mojkovčani, konačno, mogu da odahnu i proslave, a premijer Lukšić ima razloga da im se pridruži – jalovište je propisno „upakovano“, više ga niko ne može vidjeti, ne predstavlja više, po riječima Zarka Živkovića, direktora Direkcije javnih radova Crne Gore, preko koje je išao čitav posao sanacije, nikakvu prijetnju.

– Riješen je jedan od najvećih

ekoloških problema u Crnoj Gori. Izuzetno sam zadovoljan kvalitetom izvedenih radova. Jalovište više ne predstavlja nikakvu prijetnju, u prvom redu zdravlju ljudi, zatim životnoj sredini, posebno rijeci Tari – rekao je Živković.

Tokom 2002. godine, intenzivnom kampanjom „Za život bez jalovišta“, podržanom od Programa UN za razvoj (UNDP), ekološko društvo „Ekoturs“ iniciralo je „rat“ protiv neprijetne i opasne ostavštine rudnika Brskovo. Trajao je šest godina, a vo-

dila ga je država.

– S obzirom na opasnost koju je predstavljalo jalovište, označeno kao krivac za porast malignih i respiratornih bolesti u Mojkovcu, Vlada je, kao prioritet, prepoznala ekološki projekat njegove sanacije i, uz podršku donatora, obezbijedila potrebnih 10,6 miliona eura. Građevinski fakultet iz Podgorice izradio je, 2003. godine, projektnu dokumentaciju i tada je, zapravo, sve počelo – podsjeća Živković.

Prava „bitka“ počela je, međutim, izlaskom na teren, u ljeto 2005

### Finansije i izvodači

Sanacija jalovišta koštala je 10,6 miliona eura. Vlada Crne Gore izdvojila je, kroz kapitalni budžet, 8,5 miliona, Vlada Republike Češke 910.000, a Holandije 1.190.000 eura, preko UNDP, u okviru regionalnog programa sanacije prioritarnih ekoloških „crnih tačaka“, u zemljama Zapadnog Balkana.

Na sanaciji su, kao glavni izvodači, bile angažovane četiri firme. „Cjevna komerc“ je radila kolektore atmosferskih i fekalnih voda „YU BRIV“, iz Kotora, izradio je postrojenje za prečišćavanje otpadnih voda, češka firma „Vodni zdroje“ izvršila je solidifikaciju mulja, a Bemaks se pobrinuo za drenažu i nasipanje jalovišta.

### Sportsko-rekreativna zona

Mojkovčani namjeravaju da prostor nekadašnjeg jalovišta urede kao sportsko-rekreativnu zonu, privlačnu i za turiste. Parkovi, pješačke staze, travnjaci, sportski tereni, od teniskih do fudbalskog, kizalšte, čak i staza za sankanje, mogli bi se, pored ostalog, raditi na tih 19 hektara. To je samo djelić sadržaja koje je, idejnim rješenjem, predvidio arhitekta Rifat Alihodžić, i dobio prvu nagradu na međunarodnom konkursu.

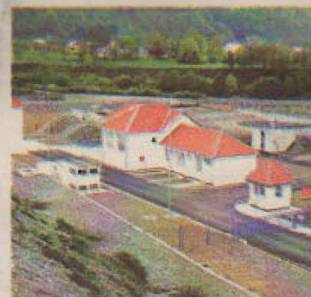
„Nadamo se da će sanacija jalovišta i njegovo pretvaranje u sportsko-rekreativnu turističku zonu, ekološku prijetnju pretvoriti u priliku za razvoj“, rekao je jedan od organizatora konkursa, koordinator UN u Crnoj Gori, Aleksandar Avanesov, na prezentaciji idejnog rješenja Alihodžića, u Podgorici, 24. februara prošle godine.



**NALTEŽI DIO POSLA:** Zabilježeno u kiku solidifikacije mulja



Pogled na novo sazidano jalovište



Postrojenje za prečišćavanje otpadnih voda

godine. Te i naredne godine izgrađeni su kolektori atmosferskih i fekalnih voda. Sljedeće dvije, gradilo se postrojenje za prečišćavanje otpadnih voda gradske kanalizacije. Mojkovac je, tada, postao prvi grad u Crnoj Gori koji je, na kvalitetan način, riješio i taj problem. Sve to bila je, ipak,

### Ugrađeno je...

Za sanaciju jalovišta utrošeno je, pored ostalog, 6.000 kubika betona i 6.000 kvadrata asfalta. Solidifikovano je, odnosno, s krečom pomiješano, 500.000 kubika mulja, ugrađeno je 200.000 kubika zemljanog materijala, 60.000 kubika šljunka iz Tare, 4.300 metara kanalizacionih cijevi raznih profila i 1800 metara vodovodnih cijevi. Izgrađeno je i postrojenje za prečišćavanje otpadnih voda, za potrebe naselja od 5.200 stanovnika.

samo priprema terena za „konačni obračun“.

– Izgradnjom kolektora i postrojenja bili su svršenii uslovi, prvo za isušivanje a, zatim i sanaciju deponije. Prije toga, na jalovište se od vode nije moglo izaci, niti bi imalo smisla, jer je i ona bila dio problema – objašnjava Živković. Ključni i najteži dio posla, solidifikacija 500.000 kubika mulja, od čega je formiran čvrst, vodonepropustan sloj i zapečućeno toksično tijelo jalovišta, urađeno je od kraja 2008. do ljeta 2010 godine. Taj posao bio je povjeren češkoj firmi „Vodni zdroje“, a ona je za dio radova angažovala podizvođače.

– Bilo je izuzetno teško i opasno. Niko od nas ranije nije radio na sličnom terenu. Često se desavalo da nam neka od mašina, skoro čitava, iznehada potone u meki mulj. U toj fazi svako kretanje mehanizacije po jalovištu nosilo je dozu rizika, tako da smo, bukvatno, svaki korak prvo morali

pažljivo isplanirati i obezbijediti. Tako smo uspjeli da izbjegnemo opasne situacije – priča vlasnik podizvođačke firme „North“ Ranko Mišić.

Završna faza sanacije, odnosno, izgradnja drenažnog sloja od šljunka iz Tare, i nasipanje meterskim slojem zemljanog materijala, počela je krajem prošle godine. Podgorička firma „Bemaks“ završila je taj posao. Ostalo je samo da premijer Lukšić, u utorak, to i ozvaniči.

– Uradili smo jedan izuzetno značajan i krupan posao. Jalovište više nikome i ničemu ne prijeti, a Mojkovac je dobio 19 hektara prostora, a može ga iskoristiti za razvojne projekte. Ponoviti, izuzetno sam zadovoljan onim što je urađeno, uz nadzor stručnjaka Direkcije i provrednog društva „Građevinski nadzor i laboratorija ispitivanja“, iz Podgorice. Vjerujem da su zadovoljni i građani Mojkovca – zaključio je Živković.