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Even on 5 October, in the morning of the day following the disaster, red sludge was standing one meter high in Devecser. Several dozens of vehicles arrived in the town, the traffic was controlled by police officers with protective masks and they secured the vacated houses. School was out because the local school building was transformed into a temporary shelter, evacuees were also lodged at the family care service and the cultural center. No one was left even temporarily without shelter. People felt it was doomsday, because they had lost their relatives, beloved ones, homes, tokens of memory, which reminded them of the past, and, at the same time, they could not see their future. Realizing the magnitude of the damages, the Government declared emergency in the areas of Veszprém, Győr-Moson-Sopron and Vas Counties. The Minister of the Interior convoked the Governmental Coordination Committee. Organized by the disaster management, the Scientific Council of the Governmental Coordination Committee presided: an expert group of the Hungarian Academy of Sciences made an onsite survey. The intervention forces managed to normalize the situation by the afternoon of the second day; in the following, the sludge, very caustic and with high alkaline pH value had to be neutralized.

The basic strategic goal of the water quality control efforts was to stop the pollution reaching the Danube River, since threatening the water source would have caused long-lasting damages.

Although there was no ready scenario to manage the disaster – now we have one – the Government immediately and decisively took measures to respond to the situation, mobilizing the personnel of the disaster management system, the fire brigades, the

FOREWORD BY THE DIRECTOR GENERAL

Hungary's most severe industrial ecological disaster so far occurred at 1230 hours on 04 October 2010, when the western dyke of cassette X of the sludge reservoir on the site of the Hungarian Aluminium Production and Sales Plc (MAL), a private company, breached. Consequently, the mixture of approximately one million cubic meters of red sludge and alkaline water inundated, through the Torna Creek, the lower parts of the settlements Kolontár, Devecser and Somlóvásárhely. Ten people were killed during and after the sludge flow, 286 persons were hospitalized. The disaster in Devecser, Kolontár and Somlóvásárhely affected 358 residential properties, over a thousand hectares of arable land were contaminated.





Police, the Hungarian Defense Forces and the National Ambulance Service to rescue and salvage the population in trouble.

A week after the disaster, a decision, unprecedented in Europe and in the world was made by introducing State control over the privately owned MAL. The Government's objective was to exclude further human risks, preserve working places, safely relaunch production under supervision, avert other risk sources and start the elimination of the damages caused, besides avoiding the loss of the company's property.

After the termination of the emergency, the state supervision attained its declared objective by the end of June 2011, which it has performed in a way and quality that other countries have shown interest to learn about our methods.

In the period of stabilization of the situation, the world's media immediately arrived at the site, just at the time when people had to be saved and the decontamination was underway. All this demanded great efforts from the Government, a contribution to which was the outstanding expertise of the operational Hungarian scientific society, the cooperation of charitable organizations and a wide range of collaboration of the Hungarian society.

Prevention was inadequate, it was absolutely missing. Naturally, prevention costs money and does not draw the attention of the media, still we have to re-evaluate its role. We have to reinforce our future authoritative and control activities. The supervision and efficiency of the safety of the use, production and transportation of hazardous materials by business entities should be increased, and the working relations and the flow of information with such companies should be made more reliable. If these systems had worked flawlessly, probably so many people would not have died or not have been injured due to the breach of the dyke of the sludge reservoir in Devecser.

The rehabilitation and reconstruction following the unprecedented disaster and the compensation of the population ended on the deadline determined in a Government Decision, nine months after the incident. All victims have a shelter above their heads; we managed to collect the contaminated soil from over a thousand hectares of inundated land and return it to the reservoirs in Ajka. Furthermore, a newly built health center is operating in Devecser to the satisfaction of everyone. The obligations assumed by the Hungarian State and the work of the affected organizations and volunteers are world-wide acknowledged, since the Government, besides ensuring new homes, assumed to replace the movables of families, not affecting the responsibility of the damage causer.

The publication you are holding in your hand is a summary of the heroic efforts made by several thousands of Hungarians in the past twelve months; is a reminder for us, at the same time, to avoid such or similar disasters to the best of our knowledge, in order to never have to prove how our country is able to join its forces in such a situation.

LTG Dr. György Bakond
Director General





DISASTER

On 4 October 2010, in the early afternoon, the western dyke of cassette X of the slurry (sludge) reservoir of the alumina plant in Ajka, belonging to MAL, breached. In the wall of the sixteen-meter high reservoir a 50 to 60 meters wide gap was created, resulting in the spill of more than one million cubic meters of red sludge and its highly alkaline water mixture, inundating, through the Torna Creek, the deeper lying built-in areas of six settlements in a row, west of the town of Ajka: Kolontár, Devecser, Somlóvásárhely, Tüskevár, Apácatorna, Kamond and Kisberzsény. The highly alkaline and corrosive industrial waste flooded large areas, causing invaluable human, economic and ecological damages in the region.

The reservoir was specially built; its dykes were not made of earth, but grey mud, which, after solidification, strongly held the red sludge in it. Due to the intensive rainfalls in the months before the incident, the precipitation eroded the weakened walls of the reservoir, which stored a multiple of the 200 to 300 thousand cubic meters of sludge envisaged in the disaster recovery plans.



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DISASTER

Ten persons were killed in the disaster; many hundreds have lost their homes, properties and subsistence. 390 people had to be immediately rescued from the life-threatening homes, contaminated with red sludge (from Kolontár, Devecser and Somlóvásárhely), and the authorities had to ensure the evacuation of another 110 persons. 286 people needed medical treatment, of whom 120 people were hospitalized. The last injured could leave the health care institution on 2 December 2010.



Besides the immediately deployable forces (disaster management and fire brigades), the Police, the Hungarian Defense Forces, the ambulance service and volunteers rescued the population in distress and carried out the decontamination. During the response activities, several members of fire brigades, the military and the Police suffered first- and second-degree burns and respiratory damages due to the highly corrosive alkaline liquid.

The sludge flow inundated 45 residential and two municipal buildings in three streets in Kolontár, 291 homes in 19 streets in Devecser, and 22 dwelling houses in Somlóvásárhely. Based on helicopter reconnaissance surveys, 3 hectares in Kolontár and 7 hectares in Devecser were covered with red sludge.

With regard to the severe situation in the region, the Hungarian Government declared emergency for the public administration areas of Veszprém, Győr-Moson-Sopron and Vas Counties, based on the Constitution and Act XXXVII of 1996 on Civil Protection, with effect from 1500 hrs, 06 October 2010. As far as its consequences and the size of the contaminated areas, this was Hungary's industrial disaster with the most severe environmental damages so far, unprecedented even in Europe.



ENVIRONMENTAL DAMAGES

The National Directorate General for Disaster Management (NDGDM), on the day following the red sludge disaster, requested the assistance of the Hungarian Academy of Sciences in the area of the dyke breach inundated with red sludge around Devecser. A team of experts with field experience, consisting of nine persons: chemists, ecologists, biologists and environmental experts investigated the consequences of the accident on the site. The experts of the Scientific Council of the Governmental Coordination Committee, consisting of members of the Hungarian Academy of Sciences compiled a rapid assessment on the situation, and drafted recommendations on the most necessary actions. By this, the helpful but unorganized researches could be precluded. The primary measurements made by the team are still valid.

The experts took further samples to assess the environmental damages caused by the red sludge, through the study of which the method to eliminate the contamination could be thoroughly considered. Several other experts joined the team's work, including the employees of the University of Pannonia and the Károly Róbert College.



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INTERVENTION AND RESCUE

The representatives of science had to face a new and cruel situation, thanks to their heroic work on the incident site, they could acquire the most possible information in the shortest possible time, which was utilized efficiently by the response forces during their intervention efforts.

Very rapid steps were necessary to prevent the contamination reaching the Danube through the surface waters, which would have caused problems for 20 to 25 years, and other international implications.

It was just as important to find out if the groundwater was threatened, since the Bakony karst lies beneath the area inundated by the red sludge, being quite a significant drinking water source not only for Hungary but Europe as well. **Another important task was to localize the sludge, that is to avoid other areas getting contaminated.**

Another problem to solve was to prevent disaster tourism that had already started in the first days. Helpful researchers from nearby and faraway universities arrived one after the other, but there was no possibility to receive them yet. The analysis of the samples taken by the researchers of the Academy sent to the site had already been accomplished four days after the occurrence of the disaster and the Scientific Council of the Governmental Coordination Committee received the instructions from NDGDM to coordinate the research efforts.



It was important to create set procedures for the research activities, because it was necessary to check the measurements later and document all the moments, since the subsequent control samples were taken on the site of the original sampling with a 20-centimeter accuracy. The surveys had to be carried out at several locations since the area was not contaminated in a homogenous way, but the “red flood” arrived in waves and with high speed and even the slightest difference in the relief of the terrain influenced the sedimentation of the red sludge.

The 3 to 4 cm thick sludge layer could be made manageable by dispersing neutralizing materials; soil replacement only became necessary where a higher amount of red sludge subsided. Of course, there were areas irreversibly damaged like a fishpond, which, practically, had to be rebuilt. However, scientists informed everyone which decontamination method was ought to be used for the different areas. The reason for the accurate planning of the decontamination was not to harm the topsoil unnecessarily, which was still intact. In this field, besides eliminating the environmental damages, the psychology of relaunching production had to be studied as well.

However, nature is capable of a surprising and unbelievable self-healing; from the moment that the red sludge spill is entirely stopped and no more pollutants would flow into the Torna Creek from the reservoirs, the Marcal River would regenerate within approx. six months. Not the fish would appear first in the creek, but the microflora and fauna serving as food, later, all other forms of life would emerge sequentially.



Measurements and researches

In Ajka, at the alumina plant, bauxite is processed according to the so-called Bayer technology: the aluminium content of the bauxite is separated from the other constituent components using sodium hydroxide under highly alkaline conditions. The resulting main product is alumina, from which metallic aluminium is produced by electrolysis. The byproduct of alumina production is red sludge with high iron content and characteristic color, which contains both fluids and solids. The specialists of the Hungarian Academy of Sciences, the Geological Institute of Hungary and an independent organization, until 13 October, carried out the analysis of the 16 red sludge samples collected in the region of Kolontár and Devecser. Based on the analysis of the samples taken from different places, the pH value of the material spilled from the reservoir varied between 11 and 14. Thus, based on these measurements, it was unambiguously ascertained that red sludge is to be considered a material hazardous to the environment.

According to the measurement data of the Institute of Material and Environmental Sciences of the Chemical Research Center of the Hungarian Academy of Sciences, the red sludge samples contained cadmium, chromium, mercury, nickel, lead and zinc in a lower, occasionally much lower concentration than permitted for sewage slurry. The arsenic content in the sample taken in the outskirts of Kolontár is also lower than the threshold value of sewage slurry. The metal content of red sludge means a real environmental hazard if the metals are dissolved from it, and thus it becomes possible for living organisms to absorb them easier. Based on the measurement data, the metals examined did not dissolve from the red sludge under the given conditions.

Impacts on the soil

The specialists of the Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, on 8 October, based on international sampling protocol, took sample of the soil profile in a depth of one meter in Kolontár and Devecser in order to ascertain if any contaminated materials seeped into the deeper layers from the red sludge that had already been covering the surface for almost four days. The researchers first drilled into the soil in one meter depth, then they deepened the "hole" created as a result of drilling and took samples from all the layers every five and ten centimeters, respectively.

The results of the laboratory analysis of the soil samples showed that even the most dangerous and most mobile heavy metals in the red sludge could not seep deeper than 10 cm into the soil, and neither there did they exceed the pollution limits. Based on this, it was reasonable to draw a conclusion that the deeper soil layers and the first aquifer are directly not vulnerable.

Aerial survey

Parallel to onsite sampling and measurements, aerial survey started with sophisticated methods as well. With the help of thermal imagery recorded in the first phase, they studied the structural percolations, sand boilings and leachate. In the vicinity of the footing of the dyke, experts identified cold spots giving evidence of the increased humidity of the soil, from which one could make the conclusion that the soil was wetter, i.e. softer. Specialists of the Károly Róbert College continued checking the places where the wall of the reservoir sank the fastest.



Water chemical and air pollution impacts

The experts of the Water Management and Environment Protection Central Directorate of the National Technical Operations Control Staff and the National Public Health and Medical Officer Service (NPHMOS) carried out the water quality check of the areas affected by the red sludge contamination. Based on their ascertainments and tests, **drinking water did not get polluted, it remained consumable all the time.**

As far as the water of the Torna Creek, an automated measuring container was measuring its pH value every hour.

The health status of local inhabitants was screened by an organization especially established for this purpose, the Governmental Health Screening Center. The result of the screenings was always negative. The Public Health Administration Body of the Veszprém County Government Office regularly prepared public information materials, which were published in the usual way (doctor's consultation rooms, schools, mayor's office, teletext). Through the Governmental Coordination Center for Reconstruction in Devecser, charitable organizations distributed dust masks and provided opportunity for lung screening as well for the local residents.

Based on the tests of the samples taken by the employees of the University of Pannonia, one could not make an assumption on the movement (dissolution) of heavy metals by water in an alkaline solution. Experts modeled the consequences of the gradual drying, i.e. dusting of the red sludge spilled on the topsoil. Model experiments showed that the respirable dust made up approximately one thousandth of the total mass of red sludge, which was a high proportion compared to the respirable fraction of other bulk solids and natural soils as dust.

When moving the red sludge a reddish smoke like material is released, showing the presence of a large quantity of and visible fine dust. The flying dust consisted of coarse and fine particles. The coarse particles can subside in the respiratory system. The alkaline solution forming from the inhaled red sludge dust can mean a serious threat, particularly if inhaled in larger quantities. The alkalizing, therefore health-damaging impact of the fine particles entering the alveoli may be even more significant. Therefore, **persons entering the restricted areas in Kolontár had to wear protective masks, goggles and protective clothing.**



RESCUE, DECONTAMINATION

The State acted immediately and decisively in the situation developed. The primary and most important task was to ensure safety of the population, protect human lives and to explore human risks. In the following, the elimination of damages in built-up areas started. The Hungarian Parliament approved the extension of the emergency declared by the Government on 06 October 2010 until 30 June 2011.

At the site of the sludge disaster, firefighters from Ajka, competent by their area of operation, arrived already in the 8th minute after the alert; later, when the situation worsened and extended, the director general of NDGDM ordered firefighters, disaster management and civil protection personnel from other parts of the country to deploy to the incident site. The main responsibilities on the site were rescuing and its coordination, organizing population protection, controlling the work of the response personnel, distributing (earthmoving) machines and other vehicles, providing protective equipment and organizing logistics. The collection of information, the clarification and updating of response personnel and intervention equipment by their functions and numbers, their deployment to the incident site, the compilation of reports on the events and tasks performed became systematic.

The affected areas were closed by the Police; the traffic was regulated through checkpoints. Only residents and response personnel were allowed to enter the settlements. A considerable number of the population fled to their relatives from their damaged properties; however, the municipalities and charitable organizations provided lodging for the victims, so nobody was left without a shelter even temporarily. The injured were looked after by the Ambulance Service or by other medical institutions at their treatment points, clinics and nearby hospitals.

Because of the threat of a new dyke breach, on 09 October 2010, evacuation was ordered for the entire population of Kolontár. Devecser prepared for an evacuation, but no new spill occurred, therefore, the above population protection measures were withdrawn. A total of five evacuation zones were designated, comprising 213 residential buildings and one or two streets per zone (25 to 65 residential buildings). The Operations Staff prepared public information materials, in which they called the attention of the population to the rules of conduct, the content of the emergency package, the notification of disabled persons, the rules of spontaneous evacuation, the route of evacuation and the reception points.

The evacuation was ordered in Kolontár at 0620 hours on 09 October, which was fully implemented by 0925 hours, thanks to the professional, disciplined and composed actions of the cadre personnel and the cooperativeness of the population.

Numerous actors participated in the rescue and decontamination operations right from the start. In the region of Kolontár and Devecser, for instance on 06 October 2010, 84 firefighters with 12 vehicles, 4 Emergency Detection Teams (EDT) with 12 persons, 103 police officers with 22 vehicles, 174 military personnel with 39 vehicles, 29 persons





with 20 vehicles from the personnel of disaster management and civil protection, 149 civilian persons with 43 machines, NPHMOS with 5 person and 2 vehicles, and 50 workers of MAL participated in the elimination of the consequences of the disaster, i.e. a total of 606 persons with 142 units of equipment. Some two weeks later, on 20 October 2010, 1,125 persons with 292 vehicles and machines participated in the relief efforts. In November, a total of 8,535 persons and 4,881 units of equipment were working on the incident sites, which, in a daily breakdown, meant the work of 400 to 500 persons, in average with 70 units of equipment, and numerous voluntary helpers.

To control and direct the elimination of the consequences of the industrial disaster, the Government established an Onsite Operations Staff from the personnel of disaster management, without delay. The mission of the Operations Staff was to coordinate mitigation and the activities of partner organizations, to command and control the civil protection, firefighting, police, military forces and volunteers deployed to the incident sites and to provide them with protective equipment and garments. Other tasks were to ensure the rest and catering of the response personnel, to receive and register donations and the labor force offered. This meant the coordination of several hundreds of persons and units of equipment daily.

The registration of the damaged properties and the ascertainment of forensic construction expert damage values started. Furthermore, the survey of properties by experts appointed by the Undersecretariat for Settlement Arrangement and Construction of the Ministry of the Interior, and their categorization, whether to be demolished or reconstructed. It was the period when actions had to be taken to accomplish the forced demolition of

the first 12 residential buildings in Kolontár in order to facilitate the construction of the protective dyke.

Onsite tasks, in the beginning, focused on four main areas:

- saving lives;
- cleanup of built-in areas;
- decontamination of outer areas;
- water quality damage elimination of living waters.

Later on, after the initial protection efforts, long-term measures for rehabilitation and reconstruction came to the fore.

Other tasks of the Operations Staff were to continuously control – amongst others – the cleaning of streets, footpaths and other public areas, decontamination of forecourts, cleanup of backyards and courtyards, decontamination of trafficking vehicles, the continuous monitoring of living waters and drinking water sources, and the concentration of dust in the air.

The decontamination of the outer areas was carried out in several workplaces (Devecser, Somlóvásárhely, Somlójenő, Tüskevár, Apácatorna, Kisberzsény, Kamond), **affecting a total of 267 hectares of contaminated land. Altogether 870 thousand cubic meters of contaminated substances and 146 thousand cubic meters of demolition rubbles were transported to the dumps.** In a daily average – depending on the terrain and weather circumstances – it meant 3 to 6 thousand cubic meters.

The dumps had to be designated by MAL. The competent mining authority issued permission to deposit the red sludge collected on the top of the recultivated cassette VII, and the demolition rubbles at the western side of cassette X.





MEDIA

During the red sludge disaster, communication was implemented by the disaster management based on a central decision.

Dispersing information to the press was performed within strict limits, because the movement of not only the representatives of the media but, at times, of local residents as well was significantly restricted in Kolontár and Devecser. It was necessary because of the classified period, the promulgated emergency. Spokespersons helped the work of the representatives of the media. They took the press representatives to all the important places (e.g. reservoir dyke, evacuation sites, immediate vicinity of the protection and decontamination activities in a controlled, organized format, in groups.

The domestic and international journalists were interested in practically everything; but understandably, the reporters of neighboring countries were inquiring mainly about the danger of the contamination spreading in their countries. With accurate and authentic information, it was possible to prevent guessing and rumors, whether red sludge could spread with the wind or would reach the rivers, etc.

The issue of spreading was regarded as a sensitive area in general, because of the unprecedented feature of the incident in Europe, it was crucial as far as Hungary's judgement, what kind of information is dispersed abroad. Any communication error could have caused damages to diplomacy and the economy as well. It was of utmost importance whether the contamination would reach the Danube or not. Even the slightest difference from reality could have caused the loss of credibility of information.

The interest shown by the representatives of the press coming from all parts of the world was continuously intensive and started immediately right after the dyke breach of the slurry reservoir on the first day of the incident.

After the resettlement to Kolontár, practically when the physical danger ceased, the interest shown by foreign editorial offices decreased. The process of decontamination and reconstruction did not attract the international press to such an extent, however, interest was still shown periodically.



INTERNATIONAL ASSISTANCE

After the occurrence of the red sludge disaster, NDGDM, with help of its international department, continuously informed the EU Member States through the EU Civil Protection Mechanism Monitoring and Information Center (EU MIC), in the form of daily reports.

Based on the decision of the Governmental Coordination Committee on 07 October 2010, NDGDM requested, through EU MIC, experts with relevant international experience, for consultations on the elimination of environmental damages and decontamination.

Several environmental experts sent their CVs through EU MIC to NDGDM – 50 persons from 10 member states. Based on their professional background and experience gained in international missions, five experts were selected. In the following, EU MIC, cooperating with NDGDM, started preparing and organizing the dispatch of the 5-person-strong EU expert team to Hungary. To make an onsite reconnaissance and to prepare the field activity of the EU team of experts, EU MIC sent a liaison officer to Hungary on 09 October.

On 11 October, the team arrived with Belgian, German, Swedish, French and Austrian experts with high level of scientific and international practical background in dyke/dam and water management, eco-toxicology and decontamination of industrial plants. **The EU team's mission was, in cooperation with the Hungarian authorities, to elaborate recommendations on how to assess the negative environmental impacts of the red sludge and to work out an optimal solution for eliminating and mitigating the damages.**

The EU team of experts, on 12 October, started its field activity with data collection. A part of the team carried out helicopter reconnaissance, soil experts made a site survey on the dyke, where they consulted with forensic experts and geologists. The team analyzed the measurement results at the end of the day.

In Devecser, on 13 October, the EU experts were shown in detail the results achieved so far, the technical actions taken and the following tasks. During the day, the EU experts also consulted with construction and plant specialists, and received short information from NDGDM officials on the individual protection equipment, and then observed a water sampling and analysis test at the Torna Creek.

The team began drafting its final report on 14 October. A Swiss environmental expert of the UN Environment Program exchanged experience with the team that day. Besides the EU and the Swiss experts, a team of experts from UN WHO also made assessments in Devecser, concerning the health status of the population.

The EU team made a visit to the Hungarian Academy of Sciences, where they consulted with its researchers on the possible solutions concerning the environment in the rehabilitation phase following the disaster, like the purification and storage of the contaminated soil, and on the continuation of the decontamination of the affected rivers.

On 15 October, director general LTG Dr. György Bakondi received the EU team on a courtesy call at NDGDM. During the meeting, the EU experts made account of their experience gained in the course of the week and their short- and long-term recommendations on the rehabilitation of the environment. In their report, their aggregated professional recommendations covered, inter alia, the topic of stopping/limiting the spread of the red sludge in the air and water, mitigating the risks on human health and further analyzing risks. In the following, the team members returned home.

European Commissioner for International Cooperation, Humanitarian Aid and Crisis Response, Kristalina Georgieva made an official visit on 18 October at the incident site.



COORDINATION OF RELIEF

After the disaster, the flow of Hungarian and international donations immediately started, therefore a special expert working group was needed to deliver the offers. This group set up the central registration system of offers, in which a total of 2,101 donations (1,757 Hungarian and 344 international) were recorded, out of which, after an evaluation made according to mutually accepted guidelines 398 offers (368 Hungarian and 30 international) were accepted.

The establishment of the team consisting of persons experienced in organizing fund raising seemed useful, whose leader was at the same time a member of the Operations Staff. The onsite workers of the charitable organizations could decide in specific cases where and what were needed, and how a donation could reach its destination.

The activity of charitable organizations

Almost at the same time when the disaster occurred, several charitable organizations started their activities like the [Catholic Caritas](#), [Hungarian Baptist Aid](#), [Hungarian Red Cross](#), [Hungarian Maltese Charity Service](#), [Hungarian Reformed Church Aid](#) and the [Hungarian Interchurch Aid](#).

NGOs independently performing their activities in the first phase compiled food and personal hygiene packages for the victims, and granted psychological assistance, and distributed protective drinks and energy replacement foodstuffs for the response personnel. In the course of the disaster, the work of approximately 2,400 volunteers assisting the charitable aid activities was organized on the incident site.



According to the decision made by NDGDM, in Devecser, the Civilian Humanitarian Coordination Center was established to coordinate the activities of these organizations and to promote targeted damage mitigation.

The above organizations divided the relief tasks amongst each other based on the type of victims and decided, case by case, according to their own internal rules, on the method of mitigation. All participating NGOs accepted the Government's conditions on granting aid, met the requirements to provide information and data, and observed the cooperation obligations with the competent bodies.

The above charitable organizations, cooperating with each other, distributed almost 9,000 food and personal hygiene packages, respectively, amongst almost 350 families, and provided catering twice a day as well. Beyond this, they gave a food package in the value of HUF 10,000 to each family as a present for Christmas and Easter. For citizens temporarily accommodated not at community shelters, they provided lodging subsistence as well. These organizations greatly contributed to transporting the recovered patients home from the hospitals.

The charitable organizations, in connection with the red sludge disaster, spent almost HUF 600,000,000 on damage mitigation.





After creating the necessary legal criteria, the Government issued its **Decision on the appointment and tasks of the Government Commissioner acting on behalf of the Hungarian State during the State supervision of MAL, appointing LTG Dr. György Bakondi Government Commissioner on 12 October 2010**. The activity of the Government Commissioner was directed by the Prime Minister, he was responsible for his activities to the latter. His work was assisted by two deputies, the supervisors and experts.

MAL, from a national economy aspect, is a significant company, whose State supervision was carried out in the public interest. This was an unprecedented measure, in both Hungary and the world. The Government's aim was to relaunch the safe production of the plant as soon as possible after the obligate downtime following the disaster, avert another eventual incident and start the necessary mitigation of the damages. Another objective was to facilitate the continuous safe operation of the plant as one of the largest employers in the region without loss of assets and observing the authoritative rules.

The following challenges were encountered at the beginning of the State supervision:

- The human resources, organizational structure of MAL were insufficient from many aspects to manage such a disaster.
- All the employees of the firm were exposed to intensified physical and psychic load.
- Due to the disaster, the amount of specific tasks drastically and suddenly increased; to cope with this MAL did not have the necessary number of and skilled enough employees.
- A vast majority of statutory regulations were not established bearing in mind the aspects of applying them in similar disasters.
- The licensing processes were often surrounded by jurisdictional disputes.

The State supervision was peculiar also from the aspect that the presently known quality control models were not applicable to the situation developed; the methodology of the State supervision had to be shaped after the start of the work.



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STATE SUPERVISION OF MAL



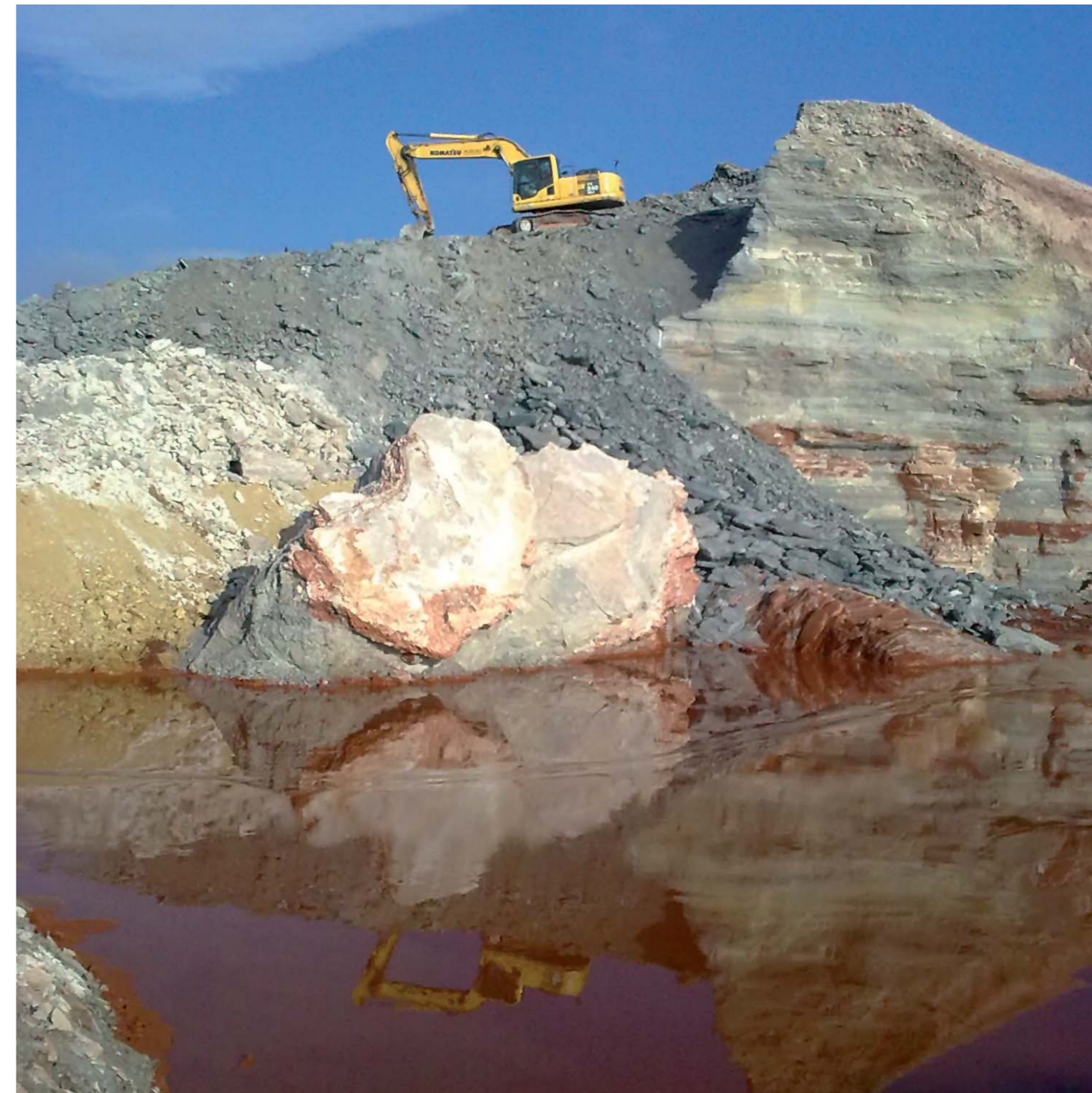
The State supervision used the following tools and elaborated the methods below to achieve the objectives ascertained:

- It monitored the implementation of the authoritative imperatives, in case of need, it called upon the obliged to keep the deadlines and take the necessary measures.
- It monitored the different authoritative procedures (controls, licensing), participated in the authoritative consultations, occasionally, it also initiated them.
- When necessary, it initiated the start of authoritative procedures.
- It called the attention of the firm's management to the emerging human resources and other risks and requested the proprietors to take action.
- If needed, it assisted in solving problems with its methodological suggestions.
- It regularly patrolled and checked the plant site, documenting the actions taken and calling the attention to the deficiencies discovered.
- It facilitated the optimization of the workflow within the company, not neglecting the material or human resources of the firm.
- It assisted the MAL management before taking decisions with its expertise.
- It created an on-call system in order to be able to respond to problems or malfunctions arising outside working hours.
- It established the rules of operation of supervising and licensing the company's financial commitments, checking and monitoring the individual commitments based on the latter.

During the more than eight months of State supervision, the Government Commissioner cooperated with the management and owners of MAL. The Government Commissioner, when exercising his jurisdiction always kept in mind the proprietors' rights, and the company's business and other interests. During his operation, he strove to maintain close contacts with the authorities and specialized authorities, municipalities, and the affected part of the population. In the spirit of transparent operation, the Government Commissioner continuously informed the public on the activities of the State supervision.

Based on the previous facts, by today **it became possible to eliminate the human resources and ecological risks so far without control**. The firm has made a successful technological switch, it could preserve its market positions and its partners' confidence. We can ascertain that the State supervision, as a unique legal institution in our legal order, has been successful and achieved its goal.

For the State supervision to be successful, however, not only the expertise of the given business actor but also the aptitude and life experience of the supervisors were necessary. Springing forth from the fact that the introduction of State supervision of a business entity by itself is a crisis, the outstanding expertise, practice, flexibility, proactivity and the rapid internal communication of the supervisors have a special importance. The representatives and institutions of the Hungarian technical life and higher education helped, joining their efforts, the work of the decision-makers in critical situations. The Government Commission performing the State supervision of MAL has met all the afore-mentioned requirements, it managed the emerging problems in due time and adequate methods.





The execution of tasks was directed by the Operations Staff of the Governmental Coordination Committee and the Command and Control Staff operating in Devecser, until 03 November 2010. The latter was transformed into Governmental Coordination Center for Reconstruction (GCCR), and directed the decontamination, rehabilitation and reconstruction tasks until 01 July 2011. Emergency was terminated and GCCR was disbanded on 01 July 2011 in Veszprém County. Instead of GCCR, the Disaster Management Staff for Reconstruction (DMSR) is carrying out the further tasks of rehabilitation. The members of DMSR, the affected municipalities, partner and cooperating organizations, i.e. more than three hundred persons with two hundred units of technical equipment were performing their work to reconstruct and rehabilitate the region.

The reconstruction was implemented with unprecedented national efforts under the direction and support of the Government. The Hungarian Relief Fund was established, whose primary task was to contribute to ensuring the elementary living conditions. The Government issued a Decision on 04 November 2010 on the mitigation of damages caused by the emergency, on financing the reconstruction and rehabilitation and on the mitigation of further damages to non-residential buildings. The area designated for construction was approved as a targeted investment area with the intention **to build new houses to replace destroyed homes, according to the needs of the owners.**

Instead of the houses inundated and considered to be demolished in Devecser and Kolontár, the victims who had chosen the residential park, could move into newly built houses. The architects took into account the local construction traditions when designing the different types. When creating new parts of streets and residential communities the goal was also to retain the former micro-communities in this new environment as well. The victims received their new homes fully equipped and fitted.

The Government provided the municipalities with the extra protection expenditures and the expenses of the reconstruction of municipal properties from the Force Majeure Fund, allocated from the central budget. **Devecser received a grant of HUF 1,632,298,000, Kolontár HUF 47,900,000, Somlóvásárhely HUF 270,140,000 and Tüskevár HUF 242,000 from the Force Majeure Fund, respectively.**

The Government, through the Hungarian Relief Fund, contributed to creating the elementary living conditions, and compensated the damages caused in agricultural crops, livestock, cars and clothing.

Based on the decisions of the Relief Committee of the Hungarian Relief Fund, the following subsidies were allocated to the municipalities:



4

RECONSTRUCTION

Municipality of Devecser Town	HUF 348,557,000
Municipality of Kolontár Village	HUF 155,000,000
Municipality of Somlóvásárhely Village	HUF 27,150,000
Total allocated subsidies	HUF 530,707,000

87 homes were built in the residential park in Devecser, and 2 others outside the park. The technical handover started already at the end of June. In the residential park in Kolontár, 21 houses were built, their technical handover ended in June. So, the owners could move into their new homes continuously. One new house each was built in Somlóvásárhely and Márkó.

Besides building new homes, 127 used properties were purchased for the victims in the value totaling HUF 1,262,164,000; besides, 117 victims received compensation in cash.

The mitigation of damages in movables also took place. Concerning the so-called “green damages”, i.e. livestock, gardens, unharvested crops, contracts were signed with 186 victims in the value of HUF 71,620,070. Contracts aiming at the mitigation of damages to clothing and destroyed foodstuffs were also concluded; a total of 237 victims received HUF 92,822,630. As far as motor vehicles, 84 contracts were made; the total value of motor vehicle damages is HUF 46,182,035. To replace furniture, 170 victims received compensation, based on contracts, in the value of HUF 116,602,150.

On 08 July, the new building of the Devecser Police Headquarters was erected, at the same time, several families could move into their service homes as well. They are the ones who link their lives to Devecser besides their service there.

Thanks to the results achieved, the cooperation between the affected authorities, municipalities, charitable organizations and the population, one does not have to count with significant human and ecological risks in the future. So, on 01 July 2011, the period of emergency ended in Veszprém County, at the same time, the state supervision of MAL, in effect since 12 October 2010, was also terminated.

According to plans, on the first anniversary of the red sludge spill, on 04 October 2011, an 8-hectare memorial park will be inaugurated in Devecser, set up in an area inundated by the red sludge, not utilizable for other purposes. There will be three exhibition ponds created in the park, with a surface of half a hectare each, which will be fed by the sources of Malom-árok (Mill ditch) and the Torna Creek.

The park represents regeneration, resumption as a result of the collaboration of the country.

