Assistance in Raising Population Awareness and Preparedness in the Zone Affected by Industrial Emergency

FINAL REPORT

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T A B L E O F C O N T E N T

IMPLEMENTING COMPANY	*CONTRACT*
JINJ Ltd., 38 Zeytun 2-nd Street, 0037 Yerevan, Armenia	FKZ 380 01 166
Project Name: Assistance in Raising Population Awareness and Preparedness in the Zone Affected by Industrial Emergency	
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The project was funded by Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany.

The RA Ministry of Nature Protection project was the project coordinator and JINJ Ltd. engineering-consulting Company was responsible for the project implementation.

The project was implemented in the area of the RA Aragatsotn marz's Meliqgyugh community, at the gold processing factory.

JINJ engineering-consulting company is grateful to all participants involved in the project implementation, whose high professional level provided the successful implementation of the project.

1 . BRIEF DESCRIPTION OF THE PROJECT

Covering a relatively small area, Armenia is rich with mineral wealths. In the state balance of mineral wealths 579 mines are registered with approved storage of hard minerals as of 01.01.2007. Additional sources for extraction of minerals are also tailing dams.

Along with gradual rehabilitation of different industries, the country pays a special attention the environmental issues and takes measures to reduce their adverse environmental and health impacts.

To this effect Armenia has ratified a number of national laws and ratified international conventions: in 1996 Armenia ratified UN ECC ""Convention on Transboundary Effects of Industrial Accidents" (1992, Helsinki), Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991).

Besides, a number of legal documents and environmental conventions regulating issues related to public awareness raising and public participation in decision making process.

The project was funded by Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany and was aimed at implementation of Helsinki Convention Provisions.

The general objective of the project was to assist in raising awareness of population of the affected community for rapid and correct actions, not giving way to panic and implementing the safety rules in case of industrial emergency.

At the same time, the project would promote improvement of theoretical (implementation of training courses, preparation of information booklet) and practical (organization of open demonstrative training) knowledge of the public and the enterprise staff, which, in case of emergency will allow minimizing adverse impact on environment and human health.

The project duration was 10 months. It was planned to be implemented at "Mego Gold" Ltd. under "Global Gold Mining" company, considering the plant tailing pit as the main facility.

The "Global Gold Mining" organization is functioning in mining sector and is mainly engaged in gold mines study and exploitation (more details in web site at: www.globalgoldcorp.com).

The project was implemented with the agreement and support of the Company management. They mentioned that implementation of such a project would deepen the knowledge of the enterprise's staff and would promote technical and financial stability of the company.

The project envisaged carrying out training courses for the enterprise staff, as well as for the active group selected from the affected zone community.

Both the enterprise specialists involved in emergency staff of the plant and invited specialists (EMA expert, Nature Protection expert, local self-governance expert) have conducted the courses. Meetings with the population of the affected community were organized. An informational booklet was prepared and published for them. The booklet contains brief information on the criteria characterizing emergencies and public actions during emergency. The booklet is a small guideline to understand what industrial emergency is and what consequences they can have.

The gained theoretical knowledge was supplemented and strengthened through implementation of an open demonstrative training for the public.

For the project implementation it was very important to cooperate with a series of governmental authorities, such as Emergency Management Administration (EMA), Ministries of Nature Protection and Health, local self-governance authorities and other interested governmental authorities.

We hope that the successful implementation of the project will provide its continuity covering new national and regional industrial enterprises and a tradition will be formed for regular implementation of such measures.

2. PROJECT SITE DESCRIPTION

Republic of Armenia
Area
29,8 thousand sq. km

Bordering countries
Georgia (North),
Azerbaijan (East),
Iran (South),
Turkey (West).

Population 3.2 million

Population density
127,6 person/ sq.km

Capital
Yerevan (1,2 mln.population)

The Republic of Armenia is situated in the southern part of Trans Caucasus, at the northern edge of subtropical region and covers north-eastern part of Armenian upland.

Armenia is a typically mountainous country, with complicated combination of uplands, plateaus, river valleys, depressions and has relatively arid, continental climate. The natural complex of the country is characterized with complicate relief, limited land, water and forest resources, unfavorable engineering geological conditions (high seismicity, abundance of geodynamic processes) of the most part of the area. The average altitude above sea level is 1850 m, and about 40% of the area is almost uninhabitable.

The Armenian area is divided into 11 marzes (regions), including capital city of Yerevan (see the map). Still during Soviet times many of the Republican towns and residential areas were industrial centers. The main industrial branches currently functioning are as follows:

- Mining industry (ore-dressing and mining)
- Chemical industry
- Metallurgy
- Mechanical engineering and metal-working industry
- Light industry
- Food industry
- Electrical engineering
- Transport
- Construction

As the enterprise for model study we selected Tukhmanuk processing plant of "Mego Gold" Ltd. under "Global Gold Mining" company located in the RA Aragatsotn marz. .
In 2007 the relative weights of Aragatsotn marz's main branches of economy in the total Republican volume composed:

- industry - 1.3 %,
- agriculture - 7.6 %,
- construction - 1.0 %,
- retail trade - 0.5 %,
- services - 0.5 %.

The marz's economy base is industry and agriculture.

The industry is specialized in production of food and drinks, jewellery and mine processing. The marz's geographical position and climatic conditions are favorable for agricultural (cereals, perennial plants, forage) and cattle breeding development.

The ore processing plant is located within Pambak-Zangezur metallogenic-structural zone in Aragatsotn marz, in Getik river upstream valley. It is connected with the capital Yerevan by 72km long asphalt road.

The nearest town to the enterprise is Aparan, with around 7000 population and at 10km distance. The adjacent village is Meliqgyugh community, at 3.6km east from the enterprise.

Meliqgyugh has 1318 population as of January 1, 2008. Only 6% of the community residents (80 people) work at the enterprise.

➢ *AREA CLIMATE*

The climate of the region is moderate-climatic, and at altitudes higher than 2000m – Alpine. Winter is long-lasting and cold, with stable snow cover. There are strong winds, often frogs and tempests. Summer is warm, relatively humid. Climate in the area of the plant's tailing dam is moderate mountainous.

Climatic indicators of the site are provided in Table 3, according to Aparan town meteorological station's 30-year observations. Absolute maximum temperature is +33.0 ^{o}C, absolute minimum is -34.0 ^{o}C. Average relative humidity during the coldest weather is 70%, and during the hottest - 47%. The precipitation mainly falls during May-June and September.

Table 1 – Climatic indicators of the area

Meteorological conditions	M O N T H S												Annual
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Average monthly temperature, ^{0}C	-9.1	-7.7	-3.3	4.0	9.7	13.1	16.7	16.7	12.7	6.6	0.6	-5.8	4.5
Average relative air humidity, %	78	76	74	69	66	64	63	60	61	66	74	77	69
Average precipitation, mm	42	44	61	78	92	92	75	54	43	49	48	43	721
Average wind velocity, m/sec	2.1	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.0	1.9	2.2

➢ *WATER RESOURCES*

Hydrological network of the region is represented by river Getik and its small nameless tributary.

River Getik is a tributary to river Cassakh. The river feeding is mixed – snow melt, rain and groundwater. Permanent feeding regime is only from groundwater, therefore, the river regime scientifically varies throughout the year. The maximum output is observed in spring, whereas the minimum – in summer and winter. From January to May Getik river bed is covered by ice.

Since January 2006 "Mego-Gold" Ltd. has been carrying out monthly monitoring of Getik river water.

➢ *FLORA AND FAUNA*

Mountainous black earths formed as a result of weathering of volcanic and volcanic-sedimentary rocks are common in the region. Assessment of the flora and fauna of the area was made on the basis of the results of field studies, available literary data the materials of the RA AS Institute of Botany. Biotopes are represented by typical mountainous steppes.

About 2ha of the tailing dam area is degraded, as a result of unlimited cattle pasturing in the past. This is evidenced also by the wide spread occurrence of Cirsium anatolicum here.

Fauna species of the area under study belong to common species with wide spread occurrence in Armenia. There are not any species registered in the Red Book, thus the presence of the tailing dam has not significant impact on the flora and fauna diversity and separate species in the area.

3. DESCRIPTION OF TECHNOLOGICAL PROCESSES OF THE PLANT

Tukhmanuk processing plant capacity is 76500t/year. The mine is processed by open method. The raw material is transported from the open mine by trucks and discharged in an open site and into the receiving bunker with crusher feeder.

Gold extraction in the plant was implemented in the past by gravitation method. However, enrichment only by gravitation method is applied for gold-placer mines where content of "free" gold is predominating. In case of this ore where gold is represented in different forms – with basalt, coalesced sulfide and oxidized minerals, a combined enrichment method is preferred that allows to significantly increase gold extraction and more efficiently exploit the depths.
The content of minerals in the ore varies in a range of 3-3,6%, and the gold percentage related to sulfides (according to phase analysis) - 32,8 or 1,9 g/t. Free gold content is 1,8 g/t or 31,0% of the total content, the remaining gold is so called "rusty gold" (covered by iron oxide membrane), which is connected to buck stone and oxidized minerals and practically is not subject to extraction.
According to laboratory studies, gravitation method allows extracting only 18,6%, while the remaining 81,38 % stays in tails that makes the exploitation inefficient.

Operation of grinders with classifiers in a closed cycle and introducing of floatation technology allows increasing gold extraction with 68,9%, making the total gold extraction 87,5%.
According to the design scheme, the gravitation tails are delivered to the main floatation process, and the concentrate – to natural drying. The main floatation tails are delivered to checking floatation, and the concentrate passes through a two-stage cleaning. Checking floatation tails are considered final and delivered to the tailing dam. Checking floatation concentrate and primary cleaning intermediate product join and return to the main floatation process. The II stage intermediate product returns to primary cleaning stage, and the concentrate to Ц-6М2 condenser. From the condenser the concentrate (content of solid part - 50-55%) is delivered to БОН10-1,8-1У filter, the filtrate of which returns to the condenser. The filtered 12% concentrate is a final product and is delivered to customer after weighting.
The decandant of the condenser joins the checking floatation tails and is delivered to the tailing dam where, after sedimentation of the solid part, the clarified water returns to the plant, to the technological process.

The plant operates with full circulation system, which excludes outflow of industrial wastewater to open water basins. The main list of the ore processing equipment is provided in Table 2, and the technological scheme - in Fig. 1.

Table 2 – List and number of equipment planned under the design

No.	Action name	Equipment trade mark	Total amount, piece
1.	Classification	ГЦР-360	1
2.	Main floatation	BF -2,8 (4-Chamber)	1
3.	Checking floatation	BF -2,8 (4-Chamber)	1
4.	Cleaning I-stage	BF -1,2 (4-Chamber)	1
5.	Cleaning II-stage	BF -1,2 (2-Chamber)	1
6.	Concentration	Ц-6М2	1
7.	Filtering	БОН10-1,8-1У	1

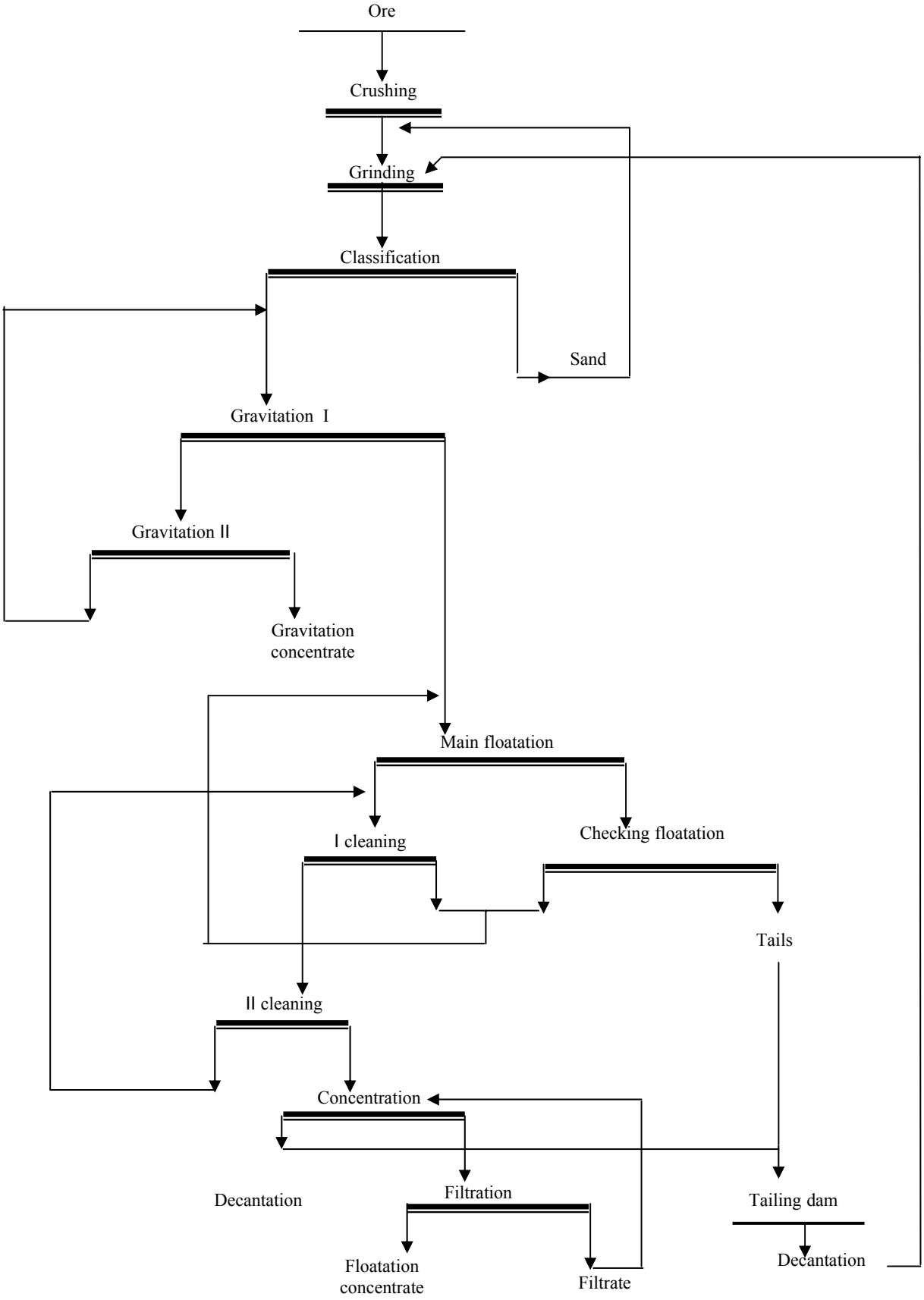
Accurate dosing allows avoiding reagent over expenditure and reducing residual reagent concentrations in wastewater.

The reagents used in the technological process and their expenditure is presented in Table 3.

Table 3 – Type, meaning and expenditure of the used reagents

	Reagent name	Meaning	Activity %	Type delivered to the process	Expenditure t/year
1	Lime	Media regulator	50	10% solution in form of lime milk	500,0
2	Butyl - xanthogenate	Collector	90	5 % solution	5,0-10,0
3	Sulphur – sodium	Regulator /depressor (depending on expenditure)	62	9 % solution	3,0-5,0
4	Transformer oil T-80	Foamer	-	-	6,0-8,0

Fig. 1 – Technological scheme of ore processing plant



➢ *TAILING DAM*

The tailing dam is constructed in Getik river upstream valley, at 80-100 m distance.

Total area of the allotted land is 2.0ha, which is a mild slope with 7% inclination. The site relief allows having here a semi plane dam.

The dam is filling type up to 2164m. For even filling of the dam, a pipeline is laid along its whole length, at each 20-25m of which distributors are installed. Filling of the reservoir is carried out sequentially, opening 2 or three distributors each time. Height of the primary dam dike is 10m. The capacity formed thanks to it allows accumulating up to 150 000 ton tails (90 000 m^3). The dike and the dam floor are fully isolated with a clay layer that prevents infiltration of industrial waters from the dam into groundwater.

The clay screen of the dike is 3,0m and the floor is 1,0m thick. In the future increasing of the dike height with 2.5m with sludge filling method is planned that will allow additionally accumulating 40 000 tons of tails.

A 3m wide road is present at the top of the tike for the dame maintenance. The tails are transported to the dam by gravity through a steel pipeline.

The tailing dam design has passed for technical and environmental; expert examination and received a positive conclusion.

According to the technological scheme of the plant, the following main workshops are present in the plant:

- crushing site,
- grinding site,
- enriching site,
- condensing site,
- filtering site,
- tailing dam.

According to the RA Earthquake engineering construction code RACC II - 2.02-94, the area under study is located with the II seismic zone ¥up to 9 intensity¤, and the maximum value of horizontal soil acceleration is 300cm/sec^2, and the soil movement velocity is 24 cm/sec.

➢ *EMERGENCY MEASURES OF THE PLANT*

The plant has an emergency plan, scenario for its implementation, as well as a trained group equipped with mobile devices for the first aid during an emergency. The group is equipped also with an appropriate communication system (information and mobile communication), through which it can communicate with the administrative staff of the plant, local self-governance authorities and acute care.
The tailing dam of the plant is gravity, with 80-100m, which reduces the emergency probability. In case of emergency the tailing dam serves as an emergency basin.
To determine the stability of the dam dike, piezometers and benchmarks are installed for determining the dike shrinkage size.
To carry out groundwater monitoring piezometers are installed in the surroundings of the dam dike, at various depths, that allow on time identification and prompt prevention of possible environmental pollution.

Environmental monitoring plan in the surroundings of the tailing dam is given in Table 4. It is to be noted that the monitoring data are presented in monthly reports.

Table 4 – Environmental monitoring

Monitoring target	Activity	Measures
Surface water	Carry out Getik river monitoring in selected points	in case of discovering pollution in river water, inform the management and undertake appropriate measures
Groundwater	Carry out groundwater monitoring through the installed piezometers	in case of discovering pollution in groundwater, inform the management and undertake appropriate measures
Recultivation	Dike recultivation monitoring, recultivation monitoring during the tailing dam conservation	in case of discovering inefficiency in recultivation measures, review recultivation program
Water supply	Monitoring of the used fresh and recycled waters	if over expenditure of water takes place that can result in unforeseen discharges, the technological process is to be regulated
Tailing dam operation	Environmental monitoring of the tailing dam surroundings, including tailing dam control.	if infringements of technical conditions of the tailing dam and tailing pipeline is discovered, their further operation must be terminated for a period required to eliminate the defects

4. ACTIVITIES IMPLEMENTED SO FAR UNDER THE PROJECT

➢ *4.1 Kick-off meeting of the project and joint visit to the plant*

The project kick-off meeting was held on September 11, in 2008 at REC Center in Yerevan. Representatives of the RA Ministry of Nature Protection and RA Ministry of Health, German Federal Ministry of Nature, Environment Protection and Safety of Nuclear Reactors, international organizations (OSCE, UNDP), public sector, as well as the industrial enterprise The details of the activities planned under the project, as well as the actions implemented before the meeting were represented to the participants. The participants welcomed the project idea, considering the project being very important both for Armenia and the region.

Two main issues were considered to be very important for the project implementation:

- the importance of the project implementation for Armenia,
- the international importance of the project for the funding party.

"Global Gold Mining" company and "Mego Gold" Ltd. under its subordination where the project was being implemented, stated about their support to the project implementation.

The German party attached special importance to the analysis of the sector legislation and development of international model guideline intended for the population in case of emergencies. OSCE Armenian office too stated its support to the project implementation activities.

The Water Resources Management Agency under the RA MNP considered it possible to include the project outcomes in water basin management plans.

This meeting allowed the representatives of state, private and non-governmental sectors exchanging the available information and ideas, discussing the activities planned under the project, providing their comments and suggestions on the further actions that would have its positive effect on increasing the efficiency of the project implementation.

A visit was made by the project experts and the representatives of German Federal Ministry of Environment to the project industrial enterprise where the representatives of the enterprise also joined the group.

The participants got acquainted with the working conditions; management of the enterprise and the employees explained in details the technology and equipment of the production.

The joint group visited the ore to observe the explosion works, transportation of the raw material to the enterprise and its processing technology (crushing, grinding, classification, gravitation, floatation, compacting, filtering, tails, tailing dam).

A visit was made also to the laboratory of the enterprise where they got acquainted with the laboratory processes and equipment.

➢ *4.2* Training courses *for the plant staff*

Within the framework of the project the first training courses were held for the enterprise staff and the population of the local community.

The following topics were represented during the training course for the staff:

I seminar topics

1. Description of the plant's technological process and the most dangerous nodes in terms of emergency (expert of the enterprise)
2. Industrial accidents and their adverse effects. International experience in the sphere (expert of safety of industrial facilities)
3. Probability of emergency risk in dangerous industrial facilities. The reasons of emergency and their environmental impact. Elimination of the emergency results (emergency expert).

II seminar topics

1. Impact of tailing pits on environment and the problems related to it (Environmental expert)
2. Necessary measures to be undertaken in case of emergency discharges (toxic reagents, industrial wastewater, petroleum, and other hazardous substances) to environment (Health expert).

3. Necessity to establish traveling emergency group and its actions in case of emergency. The order of notification in case of emergency (Emergency expert).
4. Methodology of checklists application in industrial enterprises (expert of safety of industrial facilities).

III seminar topics

1. Legal regulation of the sphere in case of emergency situations. Necessity to raise the staff preparedness and meeting the safety rules (emergency expert of the enterprise).
2. Industrial safety. Legal regulation of the sphere. First aid provision in case of emergency situations (health expert).
3. Necessity of strengthening "LSGAs-Enterprise-Public" relations and cooperation boundaries (LSG expert).

With suggestion of the Water Resources Management Agency of the RA Ministry of Nature Protection an additional seminar was organized with the plant staff and the residents of Meliqgyugh community where the Agency experts represented "Environmental protection measures in case of emergency" and the legislation regulating the sector.

The enterprise management supported much in selection and formation of the training group for the courses for the enterprise staff. The leading specialists of the enterprise – manager, plant head, chief master of production, mechanical engineer, mechanization expert, metalworker, sample storehouse head, controller, etc.

➢ *4.3 Training courses for public*

"Country Water Partnership" NGO was involved within the framework of the project for the PR activities. The NGO has a rich experience in public awareness raising and involving the public in decision making process.

The CWP NGO carried out the public awareness activities. The village administration of Meliqgyugh community, Aparan Environmental Information Center supported the NGO in its

activities. Aimed at formation of the group of the public, the NGO made visits to the rural community and through public survey clarified the population's attitude to and interest in involvement of the project activities and the information on the enterprise activity.
The training topics presented by the project experts during the training for the public were as follows:

I seminar topics

1. Actions of LSGAs, plant staff, affected community population in case of emergency (emergency expert)
2. Health issues, actions and responsibility of the corresponding authority in case of emergency (health expert).
3. Public awareness raising and participation in decision making process – Aarhus Convention (public awareness expert).

II seminar topics

1. Description of the plant's technological process and the most dangerous nodes in terms of emergency
2. Impact of tailing pits on environment and the problems related to it.
3. Raising the public preparedness level and meeting the safety rules: Population actions in case of emergency.
4. Impact of polluting substances on the environment and health, and the health problems related to it.

III seminar topics

1. Economic basics of nature use (Environmental expert)
2. The order of public notification in case of emergency. protection (Environmental expert)
3. Necessity of strengthening "LSGAs-Enterprise-Public" relations and cooperation boundaries (LSG expert)

➢ *4.4 Legislative framework of the sector*

Along with training courses also analysis of the sector legislation was done. The list of legal documents pertaining to health and emergency issues (laws, legal acts, normative, normative-technical documents, instructions, and rules) was prepared. The information on the most important ones was included in the project booklet.

Besides, the documents in safety field available in the plant were studied;

- safety rules for exploding
- safety rules for geological prospecting works
- safety rules for open mines,
- safety instructions for staff,
- safety instructions for mechanization experts,
- register for the staff safety rules, labor protection and industrial sanitary instructions,
- expert examination conclusion on technical safety of the design documents of the dangerous facility,
- environmental impact expert examination conclusion on the tailing dam design.

Study of the documents available in the plant related to the safety discovered that the plant does not have a safety certification for the tailing dam safety approved by governmental authorities; besides, the internal and external order of providing information in case of emergency is lacking. For this purpose the management of the plant received consulting from corresponding specialists and a positive response was received from the plant that the required documents be developed in a possible shortest period.

➢ *4.5 Preparation and publication of information leaflets*

To provide the public with information on the project and the further steps, information booklets were regularly prepared and disseminated among the affected community's public and the plant staff during the various stages of the project. Three information leaflets were prepared within the project:

- *the first one* was about the project objectives and the actions planned under the project. The information was represented in two versions – Armenian-English and Russian-English languages. It was disseminated among the public at the beginning of the project, before starting the main activities of the project.
- *The second one* was disseminated upon completion of training courses in autumn 2008. It was related to the activity performed by the mentioned date (training courses for public and plant staff) and further steps of the project.
- *The third one* was disseminated in the community before carrying out the open demonstrative training. The information here was mainly related to the open training, its schedule and participants.

  The information leaflets are provided in Appendix 1.

- *4.6 Preparation and publication of Guideline on Assistance in Raising Population Awareness and Preparedness in the Zone Affected by Industrial Emergency*

Within the framework of the project a guideline was prepared in three languages (Armenian, Russian and English), aimed at assisting in raising awareness of population of the affected community and the plant staff for rapid and correct actions, implementing the safety rules in case of industrial emergency, promoting enrichment of the public and the plant staff knowledge in this sphere.

The Guideline is envisaged for various stakeholders and various strata of society. It is planned for application not only at local, but also regional level.

The initial version of the booklet was discussed among all stakeholders - at the corresponding departments of the RA Ministries of Nature Protection, Emergency Situations and Health. The booklet was revised and sent again to the above mentioned Ministries for their final approval.

The booklet consists of the following sections:

1- Industrial Accidents

2. Public Defense and Behavior in Case of Emergencies

3 .Environmental Protection in Case of Emergency

4.Training

5. Sector Regulation

The first section of the guideline contains information on determination of industrial accidents and classification of emergencies. This section represents also examples of industrial accidents taken place recently in Armenia.

The second section includes information on population behavior rules, public defense organization and types, as well as the order of information provision and notification in case of emergency situations.

The section on Environmental Protection in Case of Emergency is related to the preparatory measures for emergency prevention and immediate measures to be taken in case of emergency risk or occurrence

The guideline explains also what is training and how they are classified

The last section of the guideline addresses a number of sector- relevant national and international legal documents ratified by Armenia.

There are also some useful internet links at the end of the guideline that provide information for broad strata of society (specialists and non-specialists) on various emergency situations, their prevention and reduction of their consequences, population behavior in case of emergencies, implementation of public hearings and public participation in decision making process, as well as European experience in the sector.

Before implementation of the training, the draft version of the guideline was disseminated among the community residents, so that they had a better picture of the planned measure.

The final version of the guideline was published in 100 number of printed copies. It was presented and disseminated amongst stakeholders during the closing seminar of the project.

4 copies of the guideline are attached to the report.

➢ *4.7 Preparation and implementation of open demonstrative training*

To improve the skills and capacities of plant staff, raise the community public awareness, an open demonstrative training was organized for the public.

For that purpose, JINJ Ltd. negotiated with the Rescue Service of the RA Ministry of Emergency Situations for development of appropriate scenario and conducting the training. The Rescue Service developed a scenario, and agreed it with the RA Ministry of Nature Protection, the plant management and the Client.

For implementation of the training, preparatory works were done, including: Preparatory works for implementation of demonstrative training (selection of scenario(s), agreement and, procurement of required subjects and equipment).

- development and selection of appropriate scenario(s) for demonstrative training
- agreement of the latter with the heads of the plant,

- gaining necessary permits for implementing the training
- purchase of the required subjects, equipment required for the training,
- gaining the agreement of all participants of the measure.

Though the training was planned in April 2009, it was implemented in June, because of the following reasons:

- there were construction works being implemented in the plant;
- the representatives of the Ministry of Emergency Situations engaged in the project were busy with their training courses.

According to the scenario developed in advance, an open demonstrative training was organized for the public on June 25, 2009 with involvement of the Ministry of Emergency Situations (firemen, rescuers, etc.), environmental, health (marz Hygienic and epidemiological inspectorate, acute care) units, police, the plant's emergency staff and local self-governing bodies.

Two scenarios were applied during the demonstrative planning:

1. The marz's rescue department gets warning on the emergency in the tailing dam, according to which, because of a fracture in the earth embankment of the tailing dam, as a result of which emergency outflow occurred into the nearby river bed.

Upon receiving the warning, the marz's rescue department organizes:

- a special examination in the emergency place and implementing rehabilitation works,
- informing the community population on the emergency and about their behavior rules in such a situation,
- protection of houses and property of evacuated residents, public order provision with police department forces,
- sampling of river water by the marz's Hygiene and Anti-Epidemiological Surveillance Inspectorate and sending for laboratory analysis.

2. A warning is received at the marz's rescue department dispatcher's room that the factory's truck for transporting diesel fuel has been crashed (turned) within the community of area. As a result of fuel leak from the truck, post crash fire has begun in the truck and in the adjacent house, there is an injured person.

3. The emergency consequences are eliminated by fire-rescue brigade, acute care and the plant's emergency task force.

A video tape of the training was shot and some parts of the film were broadcasted by TV during the program "Emergency channel" that is broadcasted with the support of the RA Ministry of Emergency Situations.

Editing of the film, preparation and reproduction of CD/video tape was done. The film on the demonstrative training lasts 10 minutes. The CD/video tape of the film is attached to the report.




➢ *4.8 Holding of closing seminar of the project*

Aimed at analyzing and discussion of the project results, a closing seminar was organized with the stakeholder participation on August 19, 2009. Representatives from the RA Ministries of Nature Protection, Emergency Situations, Health, as well as international organizations (OSCE, UNDP), non-governmental and private sectors, "Global Gold Mining" Company, Tukhmanuk processing plant and from Meliqgyugh community's local self-governing bodies and residents took part in the seminar. The Agenda and the list of participants of the seminar are attached.

The project goals and tasks, as well as the results of the trainings and the needs identified within the framework of the project were represented to the seminar participants by Ms. Kristine Sahakyan, the project manager.

Ms. Arevik Hovsepyan, project expert represented the works carried out with the population of Meliqgyugh affected community, and the results of the social survey implemented in the community. According to the results, about 45% of the community population were dissatisfied with the presence of the plant. Among the main reasons of the residents' dissatisfaction are:

- Lack of information on the activity of the plant (particularly on the technological processes),
- Lack of information on the environmental quality,
- Water resources pollution (particularly irrigation water),
- Lack of contact and mutual trust between the plant and the population.

The expert proposed also measures for mitigation of the population dissatisfaction.

- Establishment of mutually beneficial cooperation between the village administration and the plant.
- Organization of regular meetings between the plant management, active residents of the community and the village administration staff.
- Providing the village administration and the community residents with the monitoring data implemented by the plant, Mining and smelting Institute, as well as Environmental Inspectorate.
- Implementation of regular independent, non-governmental environmental monitoring and providing the community residents with the monitoring data.
- Study of health condition of the community residents to identify the impact of the plant on their health.
- Obtaining agreement between the plant and the village administration for keeping the river water clean during the irrigation season.
- Demonstrative visit to the plant for the community residents, acquaintance with the production process.
- Development of the community residents' skills for acting adequately in case of emergencies.

Mr. Sos Hovhanisyan, RA MH expert mentioned that the project was also demonstrative for the governmental authorities. Meliqgyugh community is specific from the point of view that it is located out of the zone of other impacts and the plant's is the only impact on it. In this regard the plant impact both on the environment and human health can be easily discovered.

The expert mentioned that the project has achieved its goal and was excellently organized. Since a tendency of industry development (especially mining industry) has been registered in Armenia, it will be encouraging to implement similar project for other industrial enterprises. The expert suggested town Agarak where copper mining begins to broadly develop. He suggested that the project is developed in another direction – implement study of public health in Meliqgyugh to identify the plant's real impact on the people health.

Mr. Karen Hovhannisyan, expert of the RA MES Rescue Service represented the goal of the trainings and their necessity. He mentioned that similar trainings should be organized also in other communities.

Mr. Shamir Shamiryan, the RA MES Rescue Service Colonel mentioned that the training implemented within the framework of the project was appraised as "good". He mentioned that there were still some gaps, since the plant had not tailing dam safety certificate approved by


governmental bodies; besides there were discrepancies in law – according to the RA Law on Civil Defense, the community head is the head of civil defense, while according to the Law on Local Self-governing bodies, the community head only supports the civil defense.

Mr. Shamiryan suggested the following:

- assist in elimination of present discrepancies in law,
- since there are 23 chemical enterprises and 12 major certified tailing dams functioning in Armenia, similar projects may be implemented also for those enterprises,
- continue and improve the training process in Meliqgyugh community.

Mr. Edgar Pirumyan, representative of the RA MNP WRMA represented the legal framework of the sector. Ms. Irina Hakobyan of Department of Hazardous Substances and Waste Management estimated the project as a support to implementation of provisions of International Conventions in Armenia.

Mr. Alexander Brutyan, representative of Tukhmanouk plant, gave a high appraisal to the project and thanked to the project executors that did their best in establishing good relationship between the plant and Meliqgyugh community. He mentioned that the plant management had already organized a meeting by its own initiative with the village population; also they were going to organize an excursion of schoolchildren to the plant where they would get acquainted with the production process. This in its turn would assist in selecting professional orientation by the schoolchildren.

He mentioned also that the safety certificate of the plant was ready and presented to the governmental bodies for approval.

Considering the project very important both for the plant and the community, Mr. Brutyan mentioned that the project continuity should be provided and for that purpose, if there is a possibility, he will fund a similar project.

Mr. Mher Mkhitaryan, community head of Meliqgyugh community, also expressed his satisfaction related to the project. He mentioned that the project was of special importance for the village and as a result of it normal relationship was established between the plant management. The plant had already provided the environmental monitoring data to the community. Joint projects were being developed for the village population, schoolchildren. He thanked to the project funders and executors, all experts for implementing the project at high level.

During the meeting Mr. Armen Chilingaryan, UNDP representative and project manager, represented the UNDP implemented project on "Strengthening of national capacities for disaster preparedness and risk reduction" and provided information on the project implementation. The project is implemented in Ararat marz and is related to disasters and the experience in their prevention. It will be completed in late 2009.

Mr. Eduard Mesropyan, director of JINJ Ltd. company implementing the project, expressed his gratitude to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany that funded the project, and especially Mr. Gerhard Winkelmann-Oei, as well as the employees of the RA Ministry of Nature protection, coordinating the project, the plant management, administration and residents of Meliqgyugh community, employees of the RA Ministries of Health and Emergency Situations, Aparan Aarhus Center, NGOs, all experts of the project for assisting in high level implementation of the project.

Mr. Vladimir Narimanyan, deputy-head of the RA MNP WRMA also thanked to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany for funding the project, and to JINJ Ltd. – for organizing the project implementation at a high level.

He mentioned that presently water basin management plans are being developed for Armenia water basins. The plans shall contain also plan-schedules for preventing, reducing the pollution of water resources in emergency situations and eliminating the consequences.

As the project continuation, Mr. Narimanyan proposed to develop a new project on "Development of Methodology for Preparing Plans to prevent, reduce and eliminate the consequences of water resources pollution" and to submit to appropriate donor organizations for funding.

Summing up the seminar, he noted that the project has achieved its goal and all objectives set.

The meeting passed with active involvement of the participants – questions, discussions, suggestions, exchange of ideas. The project implementation fact was welcomed by the participants, with giving a high appraisal to the project as important both for Armenia and the region.

Summing up the Seminar results, the participants proposed to continue the project in the following directions:

1. Study and analyze the national and international legislation of the field, identify the discrepancies between the existing laws, submit proposals for legislative changes.
2. Expand the project implementation scale and implement similar projects in other industrial enterprises functioning in Armenia.
3. Continue the project within the same plant and the affected community area, involving more participants from the community (schoolchildren, teachers, women, etc.) and from the plant, organize expanded trainings.
4. Implement the new project with involvement of the Ministry of Emergency Situations, paying a special attention to the trainings with involvement of affected community population.
5. Assist in training of specialists of all beneficiary parties of the project (Ministries of Nature Protection, Emergency Situations, Health, local self-governing bodies, non-governmental and private sector, etc.) during industrial emergency, in exchange of their experience, as well as raising the level of necessary outfit and equipment.

5 . **A F T E R W O R D**

Though the right of public participation is ratified in Aarhus Convention, which was ratified by Armenian in 2001, there are significant problems by now in this direction that need gradual solution.

This project is the second one implemented in Armenia with funding of Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany. The project on "International cooperation for emergency warning and prevention of catastrophes in Kura river basin" was the first one implemented in the South Caucasus (Armenian, Georgia, Azerbaijan), in 2003-2006. The goal of the project was establishment of information transfer system for avoiding industrial emergencies and their transboundary effects. During the project industrial enterprises have been evaluated in terms of their emergency risk and appropriate proposals for improvement have been provided. However, the scope of the project does not cover activities related to the public in the affected zone of the enterprises.

Being the logical continuation of the mentioned project, this project allows raising the public awareness (correct orientation of people, providing minimal level of human losses in case of emergency, etc.) and in its turn supports and increases the efficiency of the project implemented in the South Caucasus region.

We hope that:

- The project implementation will serve a basis for regular implementation of open training in the future.
- It will increase the level of awareness of the population in affected area and their ability to act during emergency without giving way to panic.
- It will establish mutual trust and cooperation between industrial enterprises, the public and state authorities.
- It will promote reduction of adverse impact on environment and population health in case of emergency.
- It will promote due implementation of the required measures in the regulations.
- It will promote prompt orientation and correct implementation of required actions by the staff in case of emergency.
- It will provide the process continuation , expanding the scope and involving new national and regional industrial enterprises.

The main key to the public protection inside and outside the enterprise is the level of its awareness.

THE PERSON WHO IS WARNED IS PROTECTED...