

Project ISTC - K-1240p

“Post-containment Management and Monitoring of Mercury
Pollution in Site of Former PO “Khimprom” and Assessment
of Environmental Risk Posed by Contamination of
Groundwater and Adjacent Water Bodies of the Northern
Industrial Area of Pavlodar”

Quarterly technical report

on the work performed from 1 January 2008 - to 31 March 2008

Quarter 10

Non-profit JSC “Almaty Institute of Power Engineering and
Telecommunication”, BG Chair of Environmental Technology

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Project manager

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15.07.2008

Signature / Data

1. Summary of Technical Progress

1.1. Current Technical Status

Task Subtask	Start (quarter)	End (quarter)	Status / Comments
1.1.	1	4	Has postponed till 12 quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
1.2.	4	8	Completed.
1.3.	1	12	Suspension of works in 10 th quarter
2.1.	1	2	Completed
2.2.	3	4	Completed
2.3.	5	6	Completed
2.4.	7	12	Completed /Improved prognosis of mercury contamination spread with groundwater has been produced within the plume of contamination
2.5.	10	12	Suspension of works in 10 th quarter
2.6.	8	8	Has postponed till the 12th quarters as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
2.7.	8	8	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
2.8.	9	10	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
2.9.	9	10	Completed
3.1.	1	2	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
3.2.	4	6	Implementing/ initial data have been collected for modeling the groundwater contamination by oil products.
3.3.	8	8	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
3.4.	8	8	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
3.5.	9	11	Has postponed till the 12th quarter as a result of replacement of Participant Institution PCP by Participant Institution Kaustik in the project.
3.6.	11	12	
4.1.	1	2	Completed
4.2.	2	10	Completed
4.3.	3	11	Completed/the map of the bottom sediment contamination in the wastewater storage pond Balkyldak has been produced and mercury deposits there have been estimated.
4.4.	4	8	Completed
4.5.	4	9	Implementing/Chemical and analytical works are being conducted with fish samples, taken in 6 and 8 quarters. The works will be continued in 11 and 12 quarters instead of the subtask 2.9.
4.6.	10	12	The work will be implemented in the 11 th quarter.
5.1.	1	12	Implementing/new program of mercury monitoring has

			been prepared for the Regional Department of Environmental Protection.
5.2.	1	12	Implementing /The presentations and abstracts were prepared for two international conferences.

1.2 Tasks of the work plan

Task 2: Assessment of possibility for mercury-polluted groundwater flow to change its direction; study of interaction of contaminated groundwater with bearing strata and underlying aquifers:

Subtask 2.4: To make detailed forecasts for mercury pollution spread taking into account the parameters of adsorption/desorption equilibriums.

▪ **State / Situation at the beginning of the current quarter**

On the standardized computer model there has been implemented prognosis of spread of the plum of groundwater mercury contamination for 30 years (2007 – 2037). At that the anti-filtration barrier so called cut-off wall round the derelict building 31 and 6th wastewater pumping station has been delineated while solving the prognosis task. The hydro-geological conditions as of 2007 were assumed not to be changed till the end of 2037.

By the end of the prognosis period the area of the contamination will has decreased in sand deposits. It will have moved approximately 200 m to the north-north-west direction. It is possible ingress of mercury contaminated waters to a waste ditch of the wastewater storage pond Balkyldak located in the north part of the model and going from east to west.

▪ **Fulfilled work**

The results of the computer modeling have been discussed and compiled as a poster “Groundwater modeling of mercury pollution at a former mercury cell chlor alkali facility in Pavlodar City, Kazakhstan” for the conference: *The Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds*, which will be held on 19-22 May, 2008 in Monterey, California, USA

▪ **Results by the end of the current quarter**

The abstract and poster “Groundwater modeling of mercury pollution at a former mercury cell chloral alkali facility in Pavlodar City, Kazakhstan” (the authors: Vladimir Yu. Panichkin, Oxana L. Miroshnichenko, Mikhail A. Ilyushchenko, Trevor Tanton, Paul M. Randall) have been prepared for the conference *The Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds*, Monterey (May 19-22, 2008), California, USA

▪ **Personnel Commitments**

Name	Category	Work days
IHH		
Panichkin Vladimir Yurievich	2	10
Miroshnichenko Oxana Leonidovna	2	10

Task 3 (new variant): Creation of a map of soils mercury contamination in Northern industrial area of Pavlodar with a view to develop a feasibility study of their clean up: Subtask 3.2. (new variant): Soil sampling using Global Positioning System (GPS)

▪ **State / Situation at the beginning of the current quarter**

Regional hydro-dynamic model of the Northern Industrial Area of Pavlodar city has been produced.

▪ **Fulfilled work**

The work on preparation of initial data for production of a local model of groundwater oil products contamination includes:

- Archival documents have been analyzed.
- Boundaries of the local model of the groundwater oil products contamination have been chosen.
- Detailed hydro-geological cross sections of the modeled area have been constructed;
- Schematization of hydro-geological conditions has been carried out (number of layers of the local model has been determined, their bounds on hydro-geological cross sections has been drawn, both inside and outside boundary conditions have been established for the local model etc.).
- The cross sections and the results of the schematization have been introduced into Geographic Information System (GIS) produced using MapInfo software and into the data base produced with help of FoxPro.
- Hydro-dynamic schemes have been constructed using MapInfo software.
- The results of the schematization have been transformed into formats used by GMS modeling system.

▪ **Results by the end of the current quarter**

The initial data for production of the local model of groundwater oil products contamination have been prepared.

▪ **Personnel Commitments**

Name	Category	Work days
BMP		
Panichkin Vladimir Yurievich	2	30
Miroshnichenko Oxana Leonidovna	2	30
Trushel Ludmila Urevna	2	16
Zaharova Nonna Maksimovna	2	14

Task 4: Assessment of possibility to contain the risk posed by mercury pollution of lake Balkyldak including the fish within it:

Subtask 4.4: To take the samples of biota from the lake Balkyldak and to describe the existing food chains.

▪ **State / Situation at the beginning of the current quarter**

A vector map of the wastewater storage pond Balkyldak depths and thickness of its bottom sediments has shown the increase in deposit of mercury containing sediments and mercury respectively compared to the preliminary map of 2006.

▪ **Fulfilled work**

Within the framework of GIS of the wastewater storage pond Balkyldak the vector map of bottom sediments mercury contamination has been produced (Annex, Fig.1) using Spatial Analyst module of ArcGIS software and also amount of mercury there has been calculated. The amount of mercury in the bottom sediments is calculated to be **135 336 kg**.

▪ **Results by the end of the current quarter**

The vector map of bottom sediments mercury contamination has been produced. Total mercury being released to the wastewater storage pond Balkyldak has been estimated as 135.3 tons.

■ Personnel Commitments

Name	Category	Work days
PSU		
Malkov Igor Viktorovich	1	11
Kuzmin Valery Sergeevich	1	25
Pastukh Viktor Petrovich	1	25
Bazarbekov Kairbai Urazambekovich	2	6
Kalieva Aida Akhmetbekovna	2	28
AIPET		
Uskov Grigoriy Aleksandrovich	2	30
Zyryanova Natalya Aleksandrovna	2	31
Stepanov Vladimir Aleksandrovich	3	27
BMP		
Smirnova Svetlana Yurievna	1	19
Prikhodko Tatyana Vladimirovna	1	16
Kolysheva Olga Ivanovna	1	11
Kirplyuk Eduard Valentinovich	1	12
Starodubova Valentina Fedorovna	1	14
Zhulikova Xeniya Sergeevna	2	11
Mukanov Kassym Kassenovich	2	11
Abeldenov Sailau Kassenovich	2	11
Balpanov Darkhan Serikovich	2	9
Volkov Oleg Efimovich	2	19

Task 4: Assessment of possibility to contain the risk posed by mercury pollution of lake Balkyldak including the fish within it:
Subtask 4.5: To conduct chemical analysis (including the determination of total mercury content) and morphological studies of the taken samples of biota.

■ State / Situation at the beginning of the current quarter

The data obtained on total mercury content in the bottom sediments samples are recorded to “Summary Table 08.2007” with a view to develop a vector map of the pollution.

■ Fulfilled work

Chemical and analytical works are being conducted on total mercury content determination in samples of the bottom sediments and biota.

■ Results by the end of the current quarter

Obtained data on total mercury concentrations in bottom sediment samples have been recorded to “Summary Table 08.2007” based on which the vector map of the wastewater storage pond Balkyldak bottom sediments mercury pollution has been developed. The data obtained on total mercury content in biota samples (including fish ones) are being recorded to “Summary Table 09.2007” and “Summary Table 10.2007”

■ Personnel Commitments

Name	Category	Work days
Caustic		
Akhmetov Arthur Darazhatovich	1	4
Karimov Sharapat Sattarovich	1	20

Merenkova Lyudmila Borisovna	1	20
Sedlekaya Natalia Ivanovna	1	20
Kosyashnikova Olga Mikhailovna	1	20
Tskhay Aleksandra Ivanovna	1	12
Epifantseva Tat'yana Mikhailovna	1	20
Kalinkina Yelena Aleksandrovna	1	20
Putikova Lyudmila Yurievna	1	20
Shelkopyas Lidiya Vassilievna	1	20
Zhumabekova Matsa Toleubekovna	1	20

Task 5: To draw up and discuss with local stakeholders the recommendations for the 2nd stage of demercurization and other remediation activities in the area of the former PO “Khimprom” (Northern industrial area of Pavlodar), including the recommendation for abolishment or further safe use of the wastewater storage pond – lake Balkyldak:

Subtask 5.1: To discuss the work program and obtained results with Pavlodar regional department of environmental protection and with the managers of Pavlodar Chemical Plant.

- **State / Situation at the beginning of the current quarter**

Regional authority recommended to ISTC K-1240 project to extend the scope of activity on mercury monitoring and not to conduct oil products monitoring.

- **Fulfilled work**

By agreement with Pavlodar regional akimat as well as on the basis of the results obtained for two-year works on ISTC K-1240 project the document “Justification of necessary changes in the Program of mercury monitoring in the Northern Industrial area of Pavlodar for 2005-2020” has been prepared. This document will be a basis of a tender for development of “Program of mercury monitoring in the Northern Industrial area of Pavlodar for 2005-2020” which will be held in Pavlodar city in 2009.

- **Results by the end of the current quarter**

The document “Justification of necessary changes in the Program of mercury monitoring in the Northern Industrial area of Pavloar for 2005-2020” has been prepared.

- **Personnel Commitments**

Name	Category	Work days
AIPET		
Ilyushchenko Mikhail Alexeevich	1	20
Kuzmenko Larissa Vitalievna	1	10

Task 5: To draw up and discuss with local stakeholders the recommendations for the 2nd stage of demercurization and other remediation activities in the area of the former PO “Khimprom” (Northern industrial area of Pavlodar), including the recommendation for abolishment or further safe use of the wastewater storage pond – lake Balkyldak:

Subtask 5.2: To hold the workshops, press-conferences and presentation in order to discuss the interim results.

- **State / Situation at the beginning of the current quarter**

Website <http://Hg-Pavlodar.narod.ru> has been up-dated.

- **Fulfilled work**

Presentations and abstracts were prepared for international conferences:

1. The Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds will be conducted May 19-22, 2008, at the, Monterey, California, USA

2. The 10-th International UFZ-Deltares/TNO Conference on Soil-Water Systems in cooperation with Provincia di Milano, 3-6 June, 2008, Italy

- **Results by the end of the current quarter**

Presentations and abstracts were prepared for two international conferences.

- **Personnel Commitments**

Name	Category	Work days
AIPET		
Ilyushchenko Mikhail Alexeevich	1	10
Yakovleva Lyudmila Vassilievna	2	10
Kamberov Rustam Irkenovich	2	10

Task 0.: Project Management

- **Fulfilled work**

The 10th quarter report has been prepared. Correction of ISTC K-1240 project budget has been prepared.

- **Personnel Commitments**

Name	Category	Work days
AIPET		
Ilyushchenko Mikhail Alexeevich	1	25
Kuzmenko Larissa Vitalievna	1	13
Yakovleva Lyudmila Vassilievna	2	20
Kamberov Rustam Irkenovich	2	23
Ibraeva Alma Abylkasymovna	3	15

2. Summary of Personnel Commitments

	Number of persons	Total days	Total grants (US\$)
Category I	21	407	9445
Category II	15	329	9502
Category III	2	42	705
Category IV			
Total:	38	778	19652

2.1. Change in the project personnel

no

3. Preparation of reports and publications

1. The Report for Quarter X has been prepared

4. Significant Travel and Meetings

4.1. Travel and meetings inside CIS

1. no

4.2. Travel and meetings outside CIS

1. no

5. Cooperation with foreign collaborators

no

6. Procurement

Number in accordance with Work Plan	Name	Status
	no	

7. Questions, suggestions

(Including plans for the next quarter(s), if initial Work Plan has been changed significantly).

A N N E X

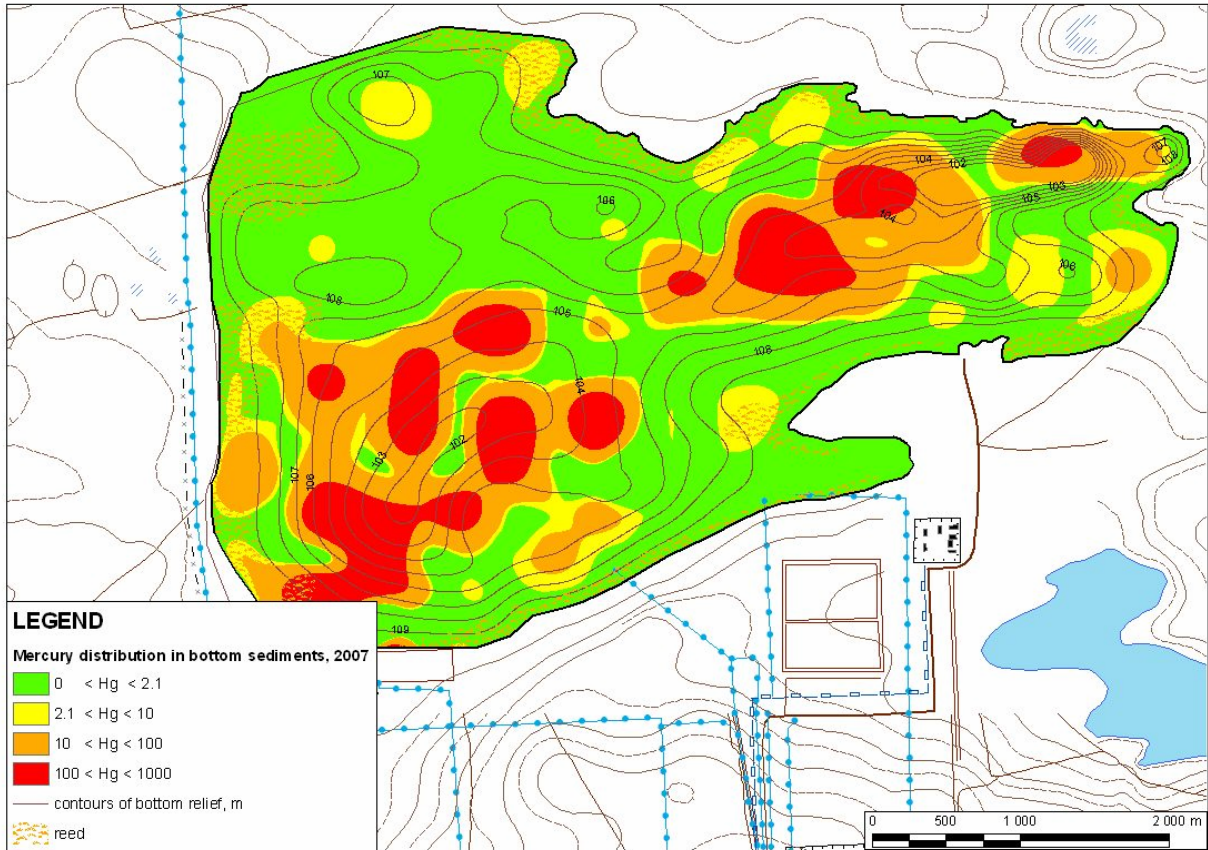


Fig.1. Map of the wastewater storage pond Balkyldak bottom sediments mercury contamination.