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Abbreviations / Acronyms

CARDS	Community Assistance for Reconstruction, Development and Stabilization
EAR	European Agency for Reconstruction
EIA	Environment Impact Assessment
EU	European Union
GTZ	Deutshe Gesellshaft fur Technishe Zusammenarbeit
IOM	International Organization of Migration
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt fur Wiederaufbeit
L/c/d	Litter/ capita/ day
L/s	Litter/ second
MAFWE	Ministry of Agriculture, Forest and Water Economy
MKD	Macedonian Denar
MLSG	Ministry of Local Self Government
MOEn	Ministry of Environment and Physical Planning
MOH	Ministry of Health
M/P	Master Plan
MTC	Ministry of Transport and Communication
OJT	On-the Job Training
O & M	Operation and Maintenance
PDM	Project Design Matrix
PE pipe	Polyethylene pipe
PHARE	Pologne et Hongri Aid a Reconstruction Economique
PIP	Public Investment Program
PIU	Project Implementation Unit
PMU	Project Management Unit
T/D	Technical Document

Exchange Rates (August 2003)

EUR 1 = JP¥130.57

MKD 1 = JP ¥ 2.14

SUMMARY

SUMMARY

The Former Yugoslav Republic of Macedonia is an inland country located in Balkan Peninsula, whose territory consists of approximately 20% of flat land and 80% of mountainous and hilly zone. The Project area is in the low land zone in the Vardar river basin (elevation +220 to 300 m) and the mountainous / hilly zone (elevation +500 to 1000 m) around Skopje, the capital city of the country. In general, rich groundwater potential is expected in lower zone, while spring and river-bed water are the main water source in mountainous / hilly zone.

In Macedonia, the rate of population served by public water supply in 2000 was 100% in urban area and 28% in rural area. The number of patients of waterborne disease (typhoid, paratyphoid, dysentery and cholera) significantly decreased from 302 patients in 1995 to 113 patients in 2000. Thus, improvement of public hygiene condition through public water supply seems to largely contribute to prevent such waterborne disease. In non-piped-water served areas, water supply is poor condition in quantity and quality, since the shallow wells as their water source for domestic use is prone to be contaminated by sewer water, etc.

Under the circumstances, the government of Macedonia puts high priority on water supply and wastewater treatment sector to improve living conditions. In the short-term investment plan formulated in 2002, “Public Investment Program of the Republic of Macedonia, 2002-2004” (PIP), the water resources development and construction of water supply facilities based on the proposition of “Water Resources Development and Management Master Plan” (M/P) were presented as investment items. 46 water supply and sewerage projects are proposed in PIP. The fact that 39 water supply projects are proposed in PIP among 46 water supply and sewerage projects indicates that the national priority for this sector is quite high.

The Project was originally requested as a grant aid cooperation project to the Japanese Government in 1999. Then, eight municipalities were confirmed to be the priority for providing water supply service when “Project Formation Study for Water Supply / Road Construction in Albania and Macedonia” was carried out in 1999. Afterwards, the Macedonian Government revised the request and submitted to Japanese Government in 2001.

The Japanese Government decided to conduct a basic design study on the requested project. Japan International Cooperation Agency (JICA) dispatched the study team from March 19 to April 6, 2003 as the first field survey. In the first field survey, 28 villages in eight municipalities were confirmed as the request. After that, the request was examined on the basis of the screening result of each village, and also from the viewpoints of security and safety of the sites, ethnic balance of the people involved etc. In the result of screening, 21 villages in seven municipalities were selected. In the second field survey executed from May 7 to June 15, 2003, both Macedonian and

Japanese sides agreed to execute the basic design study which will cover these 21 villages in seven municipalities as its target villages. After the team returned to Japan, further studies were made to prepare draft basic design report. A mission was sent from 27 July to 8 August, 2003 to explain and discuss on the draft report. Afterwards, overlap with USAID was found in project components of Pobozje village in Cucer Sandevo municipality. As the result of coordination with Macedonian side, Pobozje was excluded from the Project components of the Japan's Grant Aid. Accordingly, the Project areas finally consist of 20 villages in seven municipalities. This basic design report was finally made as the result of the study.

In the Project areas, the rate of population served are from 18% to 78% in rural areas outside Skopje city, while it is 85% in Cair municipality in Skopje city. The Project will set the objective of raising the rate of population served to more than 80% in target Municipalities (over 90% in Cair). In order to achieve this objective, the Project will provide the materials, personnel and fund required for the construction of water supply facilities in villages in Skopje outskirts.

The target year of the Project will be year 2008 which is five years after the end of the basic design study, as the short-term project. The population in the Project area in 2008 is 33,709 and planned served population is 32,435. In water supply planning and facility designing, the Project area was divided into eight systems, in consideration of water sources and geographical characteristics. The target village and population and systems are shown in table below.

Population Served, Unit Water Demand and Production Capacity by System

Municipality	Village	Population Served (year 2008)	Unit Water Demand (L/c/d)	Water Supply System	Water Source	Production Capacity (m^3/day)
Cucer Sandevo	Kuceviste	2,183	100	Kuceviste	River-bed	532
Cair	Radisani	9,656	150	Radisani	Skopje city	2,720
Gazi Baba	Goce Delcev	1,554	145	Joint system of three municipalities	Groundwater	5,446
	Jurumleri	3,565	145			
	Kolonie Idrizovo	1,384	145			
	Idrizovo	2,561	145			
Petrovec	Ognjanci	1,332	145			
	Petrovec	2,748	145			
	Kjojlija	391	145			
	Rzanicino	996	145			
Ilinden	Mralino	881	145			
	Bujkovci	711	145	Ilinden East	Groundwater	1,077
	Mrsevci	743	145			
	Miladinovci	1,592	145			
Studenicani	Cvetovo	877	65	Cvetovo	Spring	76
	Dolno Kolicani	335	100	Dolno Kolicani	Spring	69
Zelenikovo	Taor	180	150	Zelenikovo three villages	Skopje city	209
	Pakosevo	277	150			
	Novo Selo	186	150			
	Strahojadica	283	150	Strahojadica	Skopje city	92
		32,435				

The proposed water supply facilities consist of water intake facility, transmission pump facility, distribution reservoir, transmission/ distribution pipe, etc. Water supply by individual house connection with water meter is proposed. The proposed facility by system is shown in table below.

Proposed Water Supply Facilities by System

System	Intake	Disinfection	Pump	Reservoir	Transmission / distribution pipe
Kuceviste	○	○	―	○	○
Radisani	―	―	○	―	○
Joint system of 3 municipalities	○	○	―	―	○
Ilinden East	―	―	○	―	○
Cvetovo	○	○	―	○	○
Dolno Kolicani	○	○	○	○	○
Zelenikovo 3 villages	―	―	―	―	○
Strahojadica	―	―	○	○	○

The scope of Japanese Assistance is to construct the facilities up to the secondary distribution pipelines. Macedonian side, on the other hand, will construct house connection facilities (diversion cocks, water supply pipes, water meter). A part of the planned facilities has already been constructed by Macedonian side. Taking this into consideration, the scope of construction works by Japanese side will eventually cover the rest of the planned facilities that are not yet constructed. The items of construction and responsibilities of the both countries are shown in table below.

Items of Construction and Responsibilities

Responsible Side	Municipality	Village	Item of Construction	
			Facility	Detail
Japan	Cucer Sandevo	Kuceviste	Intake	Expansion of intake facility
			Disinfections	Construction of disinfections
			Transmission and distribution	Construction of reservoir (100 m^3) Rehabilitation of reservoir (100 m^3) Construction of transmission and distribution (Approx. 9.2km)
	Cair	Radisani	Transmission and distribution	Construction of pump station Transmission and distribution (for low pressure area, approx.7.4km) Transmission and distribution (for high pressure area, approx.13.2km)
	Gazi Baba / Ilinden / Petrovec		Intake	Construction of wells (2wells) Rehabilitation of existing well
			Disinfections	Construction of disinfections
			Transmission and distribution	Construction of transmission and distribution (approx. 5.6km)
	Gazi Baba	Goce Delcev	Transmission and distribution	Construction of distribution (approx. 6.6km)
		Jurumleri	Transmission and distribution	Construction of distribution (approx. 11.5km)
		Kolonie Idrizovo	Transmission and distribution	Construction of distribution (approx. 4.5km)
		Idrizovo	Transmission and distribution	Construction of distribution (approx. 8.0km)
	Ilinden	Mralino	Transmission and distribution	Construction of distribution (approx. 3.3km)
	Petrovec	Petrovec	Transmission and distribution	Construction of distribution (approx. 12.6km)
		Rzanicino	Transmission and distribution	Construction of distribution (approx. 5.7km)
		Ognjanci	Transmission and distribution	Construction of distribution (approx. 4.3km)
		Kjojlija	Transmission and distribution	Construction of distribution (approx. 1.5km)
	Ilinden	Ilinden East	Transmission	Construction of pump station Construction of transmission (approx. 4.9km)
	Studenicani	Cvetovo	Intake	Construction of intake
			Disinfections	Construction of disinfections
			Transmission and distribution	Construction of reservoir (100 m^3) Transmission and distribution (approx. 5.7 km)
		Dolno Kolicani	Intake	Rehabilitation of intake
			Disinfections	Construction of disinfections
			Transmission and distribution	Construction of pump station Construction of reservoir (100 m^3) Construction of transmission and distribution (approx.0.7km)
	Zelenikovo	Taor / Pakosevo / Novo Selo	Transmission and distribution	Construction of transmission and distribution (approx. 8.4km)
		Strahojadica	Transmission and distribution	Construction of pump station Construction of reservoir (100 m^3) Construction of transmission and distribution (approx. 4.0km)
Macedonia	Cair	Radisani	Transmission and distribution	Construction of 2 distribution reservoir tanks Construction of transmission and distribution pipes (approx. 600 m)
	Gazi Baba / Ilinden / Petrovec		Transmission and distribution	Construction of transmission and distribution (approx. 9,412 m)

The entire period of the Project is to be 22.5 months consisting of 4.5 months for the detailed design, 2.5 months for preparation of tendering and 15.5 months of construction.

The total cost estimated for Project implementation is approximately 776 million Japanese Yen, that is composed of 733 million Yen by Japanese side and 43 million Yen by Macedonian side. This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

The implementation agency of the Project is the Ministry of Transport and Communications (MTC), which is the administrative authority on water supply and sewerage sector. After the Project, the operation and maintenance (O&M) of the water supply systems will be

undertaken by Public Communal Enterprises (PE), as the public work entities that belong to municipalities concerned. The existing PEs are financially managed by revenues from water charge. Among five PEs to conduct O&M for the proposed eight water supply systems, one PE has enough experience, and other two PEs are having some institutional strengthening program through technical assistances from Austria and Germany respectively. The rest two PEs, which have less experience, are to receive necessary technical assistance from Skopje city water and sewerage PE to be capable of O&M for their facilities.

If the expected revenue from water charge is larger than the production cost, it is considered that the PE is financially sustainable. Relationship between the production cost and revenue is shown in table below. Present values are employed for the rate of accounted-for water and the water tariff except the case of Studenicani PE which hasn't managed waterworks. All PEs which currently manage waterworks are financially covered by revenue from water charge. Therefore, PEs are expected to be able to manage in financially sound condition.

Production Cost and Water Tariff

PE	Production Cost (MKD/yr)	Water Volume Produced (m^3/yr)	Unit Production cost (MKD/m^3)	Revenue		Water Tariff (MKD/m^3)
				Rate of Accounted-for water (%)	Income (MKD/yr)	
Cucer Sandevo PE	445,074	129,575	3	80%	1,554,900	15
Ilinden PE	8,389,488	2,726,550	3	70%	20,040,143	10.5
Studenicani PE	484,815	44,530	11	70%	498,736	16
Zelenikovo PE	898,225	73,365	12	75%	990,428	18
Skopje PE (Cair)	6,317,158	763,945	8	78%	7,842,934	Domestic 8.71 Large consumers 23.55

After construction of water supply facilities by the Project; transmission pipeline, distribution pipeline, reservoirs, intake facilities and pump stations, population of 32,435 will be provided water with 65 to 150 L/c/d of safe quality. The rate of population served will be improved from present 18 – 85% to 100% at all 20 villages. Water fetching work will be alleviated as a consequence of the provision of water through individual house connections.

As an indirect effect, it is expected that number of waterborne disease patients will be reduced by quitting drinking the well water which is prone to contamination.

The Project is expected to largely contribute to improve living conditions of the target villages and satisfy the basic human needs (BHN) of people. The proposed facilities are planned to be operated and maintained within the financial as well as technical capabilities of the Macedonian side.

Because of significant effects by the Project, satisfaction of BHN of people and improvement of sanitary condition are expected, the Project is evaluated as reasonable and appropriate which is proposed to be implemented under the Japan's Grant Aid scheme. With respect to operation and maintenance, the implementation organization of Macedonian side is also evaluated as viable in terms of technical level and finance. However, further enforcement on O&M organization as well as environmental protection after construction is indispensable in order to implement the Project more smoothly and efficiently. For this purpose, it is important for Macedonian side to ensure the following:

- Individual house connection will be borne by residents, though distribution networks or pipeline will be constructed by the Project. MTC, municipalities and PEs shall promote the individual house connections to the networks, by means of any measures such as subsidy for recipients of public assistance.

- PEs shall learn and maintain the technology and knowledge on operation and maintenance works that would be transferred by Japanese side on handing over the facilities to be constructed under the Project.

- Municipalities and PEs shall sustain the organization for the operation and maintenance of water supply facilities. In order to improve the administrative ability of PEs, e.g. stabilizing water revenue, thorough waterworks management by self-accounting system, etc. it is desirable to share and positively utilize the outcome of the training program by Germany or Austrian projects and the knowledge and experiences of Skopje city water and sewerage PE.

- Improvement of water supply will inevitably bring about the increase of wastewater. In the course of the Project, municipalities should consider the plan of wastewater removal or treatment and should put it into action.

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Chapter 1 Background of the Project

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(1) Background of the Project

The Project was originally requested as a grant aid cooperation project to the Japanese Government in 1999. Then, eight municipalities (17 villages of four systems) were confirmed to be the priority for providing water supply service when "Project Formation Study for Water Supply / Road Construction in Albania and Macedonia" was carried out in 1999. Afterwards, the Macedonian Government revised the request and submitted the Japanese Government in 2001.

In the first field survey of the Basic Design Study in March 2003, 28 villages in eight municipalities were confirmed as the request. After that, the request was examined on the basis of the screening result of each village, and also from the viewpoints of security and safety of the sites, ethnic balance of the people involved etc. The screening result is shown in Table 1-1.

Table 1-1 Result of Screening

Municipality	Village	1st Evaluation	2nd Evaluation	Target Village	Remarks
Cucer Sandevo	Pobozje	6	26	○	—
	Kuceviste	6	24	○	—
	Kucevacka Bara	6	21	×	T/D wasn't ready. Evaluated as technically inappropriate for long transmission distance (9km).
Cair	Radisani	6	28	○	—
Aracinovo	Grusino	4	22	×	Security reason
	Orlanci	4	22	×	Security reason
	Brnjarci	4	20	×	Security reason
Gazi Baba	Goce Delcev	6	27	○	—
	Jurumleri	6	28	○	—
	Kolonie Idrizovo	6	25	○	—
	Idrizovo	6	26	○	—
Ilinden	Mralino	6	26	○	—
	Mrsevci	6	23	○	—
	Bujkovci	6	23	○	—
	Miladinovci	6	23	○	—
	Tekija	6	23	×	Considered to be carried out by Macedonian side in future.
	Deljadrovci	6	23	×	Considered to be carried out by Macedonian side in future.
	Bucinci	6	23	×	Considered to be carried out by Macedonian side in future.
Petrovec	Petrovec	6	28	○	—
	Kjojlija	6	28	○	—
	Rzanicino	6	26	○	—
	Ognjanci	6	26	○	—
Studenicani	Cvetovo	6	20	○	—
	Dolno Kolicani	4	19	○	Selected from ethnic consideration, although lack of water source capacity was concerned.

Municipality	Village	1st Evaluation	2nd Evaluation	Target Village	Remarks
Zelenikovo	Taor	6	27	○	―
	Pakosevo	6	28	○	―
	Novo Selo	6	28	○	―
	Strahojadica	6	26	○	―

1st evaluation item: "Security", "Water source"
2nd evaluation item: "Purpose of water supply(rate of domestic use)", "Urgency and necessity (rate of population served in municipality, waterborne disease)", "Requested site (consistency to original request, possibility to connect original system, overlapping with other donor)", "Readiness of T/D (readiness, technical appropriateness, approval by municipality)", "Management capability of PE (existence of PE, affordability to pay)", "Environment (existence of sewerage system)"

In the result of screening, the villages in the municipalities of Aracinovo and Studenicani are evaluated low. Aracinovo was excluded from the study area for security and safety reasons. Studenicani, though the evaluation is low, was included in the study area in consideration of ethic balance of the beneficiaries. One village (Kucevaska Bara) in Cucer Sandevo municipality and three villages (Tekija, Deljadrovci, Bucinci) in Ilinden municipality were excluded from the study area due to the reasons concerning the result of screening and the restrictions in study schedule. Consequently, 21 villages in seven municipalities were selected.

In the second field survey executed from May to June 2003, both Macedonian and Japanese sides agreed to execute the basic design study which will cover these 21 villages in seven municipalities as its target areas. After the Draft Report Explanation Team was dispatched to Macedonia, overlap with USAID was found in project components of Pobozje village in Cucer Sandevo municipality. As the result of coordination with Macedonian side, Pobozje was excluded from the Project components. Accordingly, the Project area finally consists of 20 villages in seven municipalities.

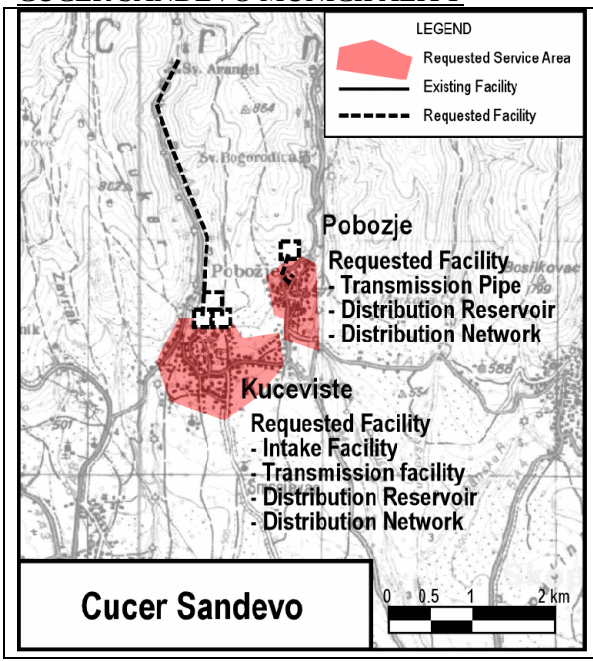
(2) Outline of the Project

The contents of the request confirmed during the second field survey is the construction of water supply facilities for 21 villages in seven municipalities. The items finally requested by the Government of Macedonia are described in Table 1-2.

As the result of examining the contents of request, it was determined that the components of the request for 20 villages in seven municipalities, that excludes Pobozje village in Cucer Sandevo municipality in which overlap in components with USAID was found, are valid and reasonable. Therefore, the Project has designed in accordance with the contents of the request.

Table 1-2 Contents of the Request

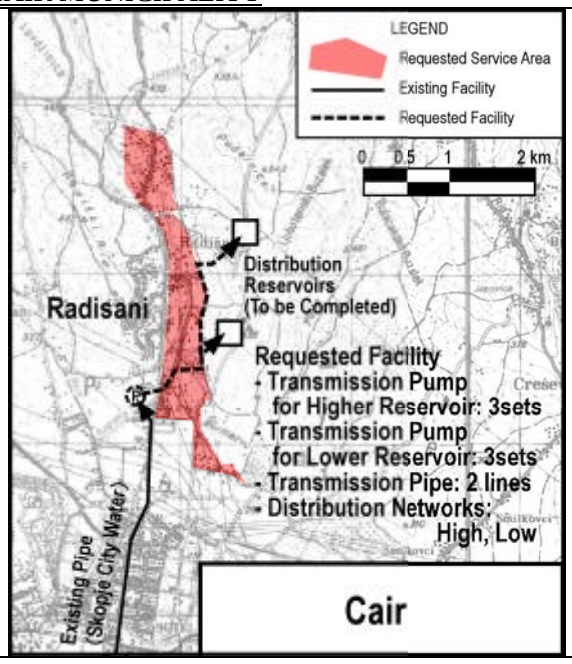
CUCER SANDEVO MUNICIPALITY



System: **POBOZJE**
Service area: Pobozje
- Installation of Transmission Pump
- Installation of Disinfection System
- Completion of Transmission Pipe: P/S to Reservoir (Remaining approx. 200 m)
- Distribution Reservoir: 1 tank
- Secondary Network in Pobozje Village

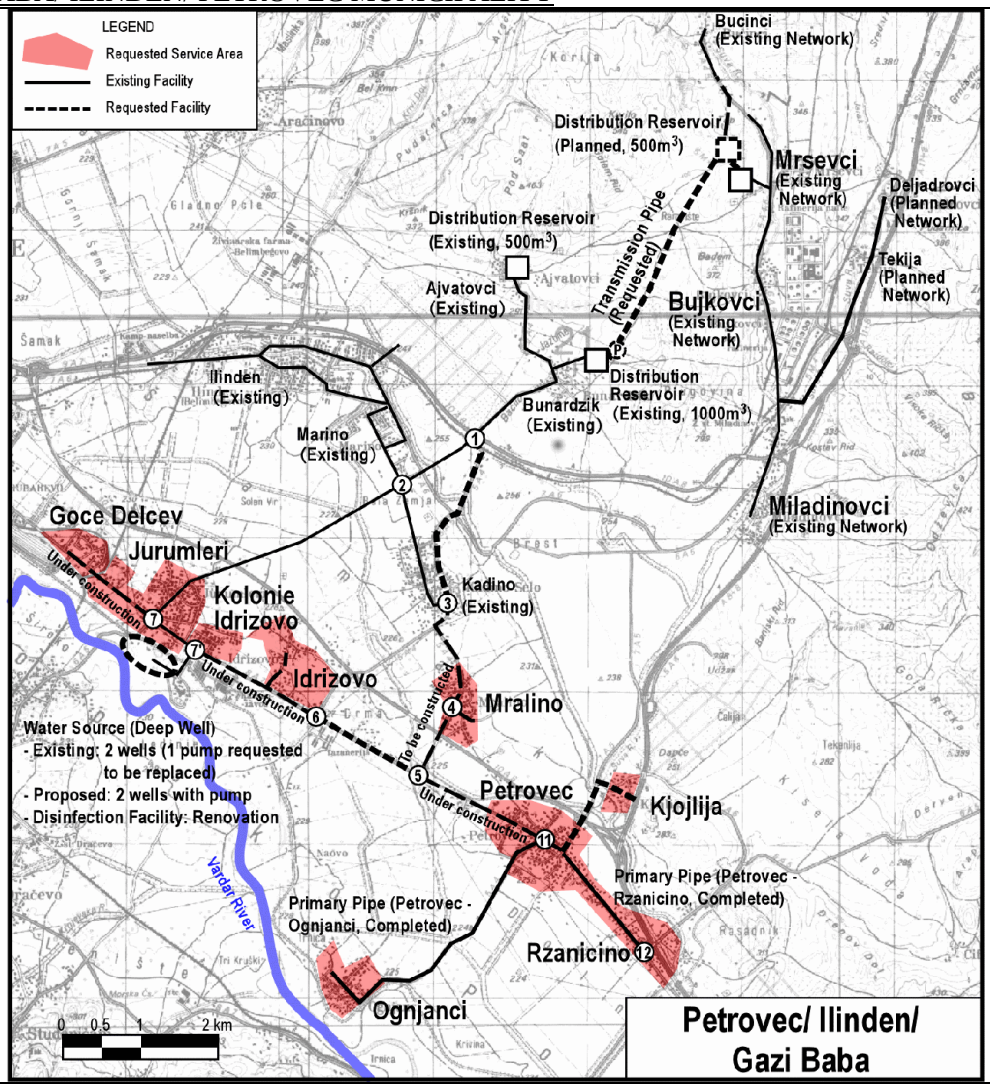
System: **KUCEVISTE**
Service area: Kuceviste
- Rehabilitation and Upgrading of Intake Facility
- Transmission Pipe: 3.0 km
- Rehabilitation of Existing Reservoir: 1 tank (including New Disinfection Facility)
- Construction of New Reservoir: 1 tank (including New Disinfection Facility)
- Secondary Network in Kuceviste Village

CAIR MUNICIPALITY



System: **RADISANI**
Service area: Radisani
- Transmission Pump House: 1 building
- Transmission Pump: 3 sets for Higher Zone
- Transmission Pump: 3 sets for Lower Zone
- Transmission Pipe to Higher Reservoir
- Transmission Pipe to Lower Reservoir
  (Except approx. 600m to be constructed by Cair)
- Secondary Network for Higher Zone
- Secondary Network for Lower Zone

GAZI BABA/ ILINDEN/ PETROVEC MUNICIPALITY



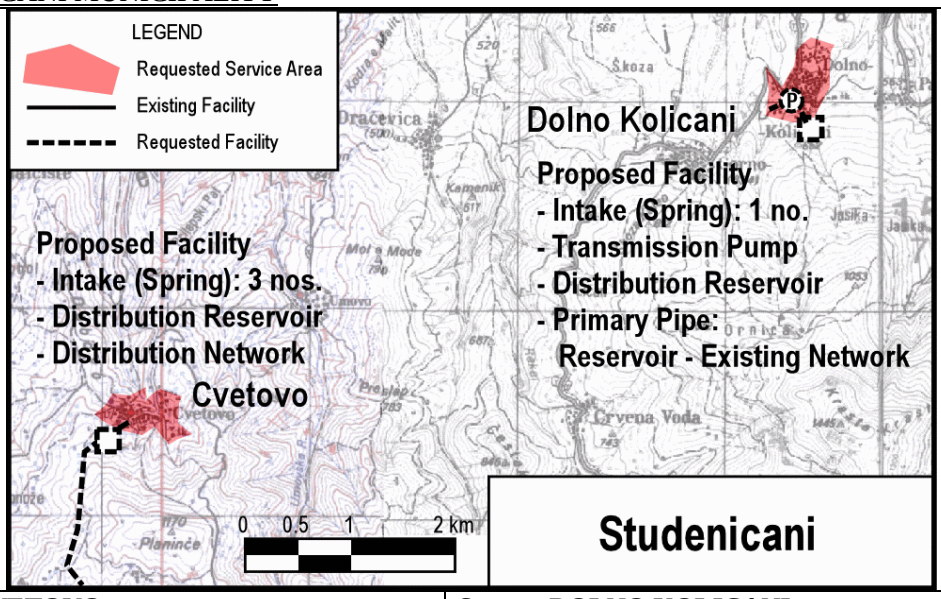
System: **GAZI BABA, ILINDEN and PETROVEC**
Service area (Gazi Baba): Goce Delcev, Jurumleri, Kolonie Idrizovo, Idrizovo (4 villages)
Service area (Ilinden): Mralino (1 village)
Service area (Petrovec): Petrovec, Ognjanci, Rzanicino, Kjojlija (4 villages)

- Intake Well in Jurumleri: Two New Wells (Jurumleri, Gazi Baba)
- Intake Pump of Jurumleri: One Pump to be Replaced (Jurumleri, Gazi Baba)
- Disinfection Facility in Jurumleri: Renovation (Jurumleri, Gazi Baba)
- Primary Pipe: 1 – 3 (2,015 m, Ilinden), 5 – 6 (2,313 m, Ilinden), 11 – Kjojlija (1,300 m, Petrovec)
- Secondary Network: Goce Delcev, Jurumleri, Kolonie Idrizovo, Idrizovo (Gazi Baba)
- Secondary Network: Mralino (Ilinden)
- Secondary Network: Petrovec, Ognjanci, Rzanicino, Kjojlija (Petrovec)

System: **ILINDEN EAST**
Service area (Ilinden): Mrsevci, Bujkovci, Miladinovci (3 villages)

- Transmission Pump: Bunardzik Reservoir Site (Ilinden)
- Transmission Pipe: Bunardzik – Existing Reservoir (Ilinden)

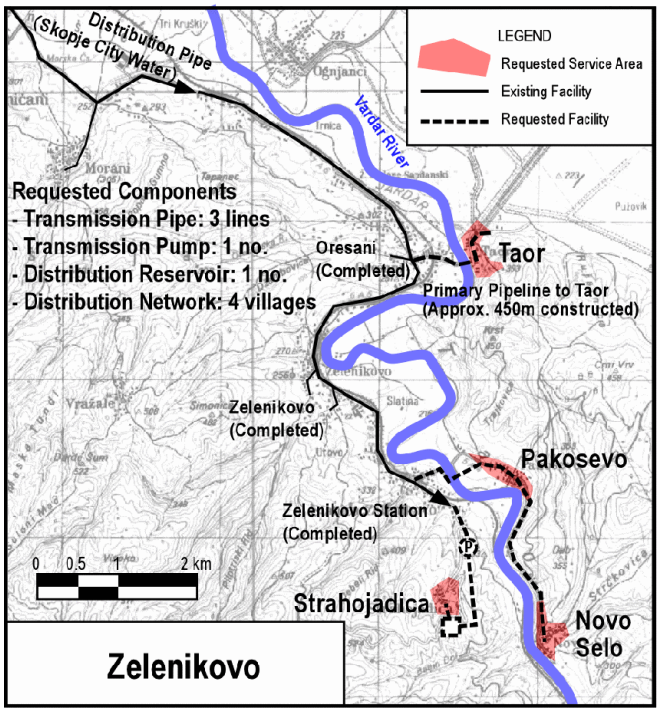
STUDENICANI MUNICIPALITY



System: **CVETOVO**
Service area: Cvetovo
- Intake Facility: 3 nos.
- Transmission Pipe: Intake to Reservoir
- Disinfection Facility: 1 no.
- Distribution Reservoir: 100 m^3 (1 no.)
- Primary Pipe Reservoir to Network
- Secondary Network: Cvetovo

System: **DOLNO KOLICANI**
Service area: Dolno Kolicani
- Intake Facility: 1 no.
- Transmission Pipe: Intake to Pump Station
- Pump Station: 1 no.
- Transmission Pipe: Pump Station to Reservoir
- Disinfection Facility: 1 no.
- Distribution Reservoir: 1 tank
- Primary Pipe: Reservoir to Existing Network

ZELENIKOVO MUNICIPALITY



System: **ZELENIKOVO Three Villages**

Service area: Taor
- Primary Pipe to Taor Village
  (Except Constructed Pipe, Approx. 450m)
- Secondary Network: Taor

Service Area: Pakosevo & Novo Selo
- Primary Pipe: Zelenikovo St. to Novo Selo
- Secondary Network: Pakosevo and Novo Selo

System: **STRAHOJADICA**

Service Area: Strahojadica
- Pump Station: 1 no.
- Transmission Pipe to Reservoir
- Distribution Reservoir
- Primary Pipe: Reservoir to Network
- Secondary Network: Strahojadica