

**Ministry of Local Government
Palestinian National Authority**

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
SOLID WASTE MANAGEMENT (PHASE 2)
IN PALESTINE**

December 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

YACHIYO ENGINEERING CO., LTD.

PREFACE

In response to a request from the Palestinian National Authority (PNA), the Government of Japan decided to conduct a basic design study on the Project for Improvement of Solid Waste Management (Phase 2) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Palestine a study team from November 27 to December 28, 2005.

The team held discussions with the officials concerned of the PNA and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two parties.

I wish to express my sincere appreciation to the officials concerned of the PNA for their close cooperation extended to the teams.

December, 2006

Masafumi Kuroki
Vice President
Japan International Cooperation Agency

December, 2006

LETTER OF TRANSMITTAL

We are pleased to submit to you the basic design study report on the Project for Improvement of Solid Waste Management (Phase 2) in Palestine.

This study was conducted by Yachiyo Engineering Co., Ltd., under a contract to JICA, during the period from November, 2005 to March, 2006 and from November to December, 2006. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Palestine and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

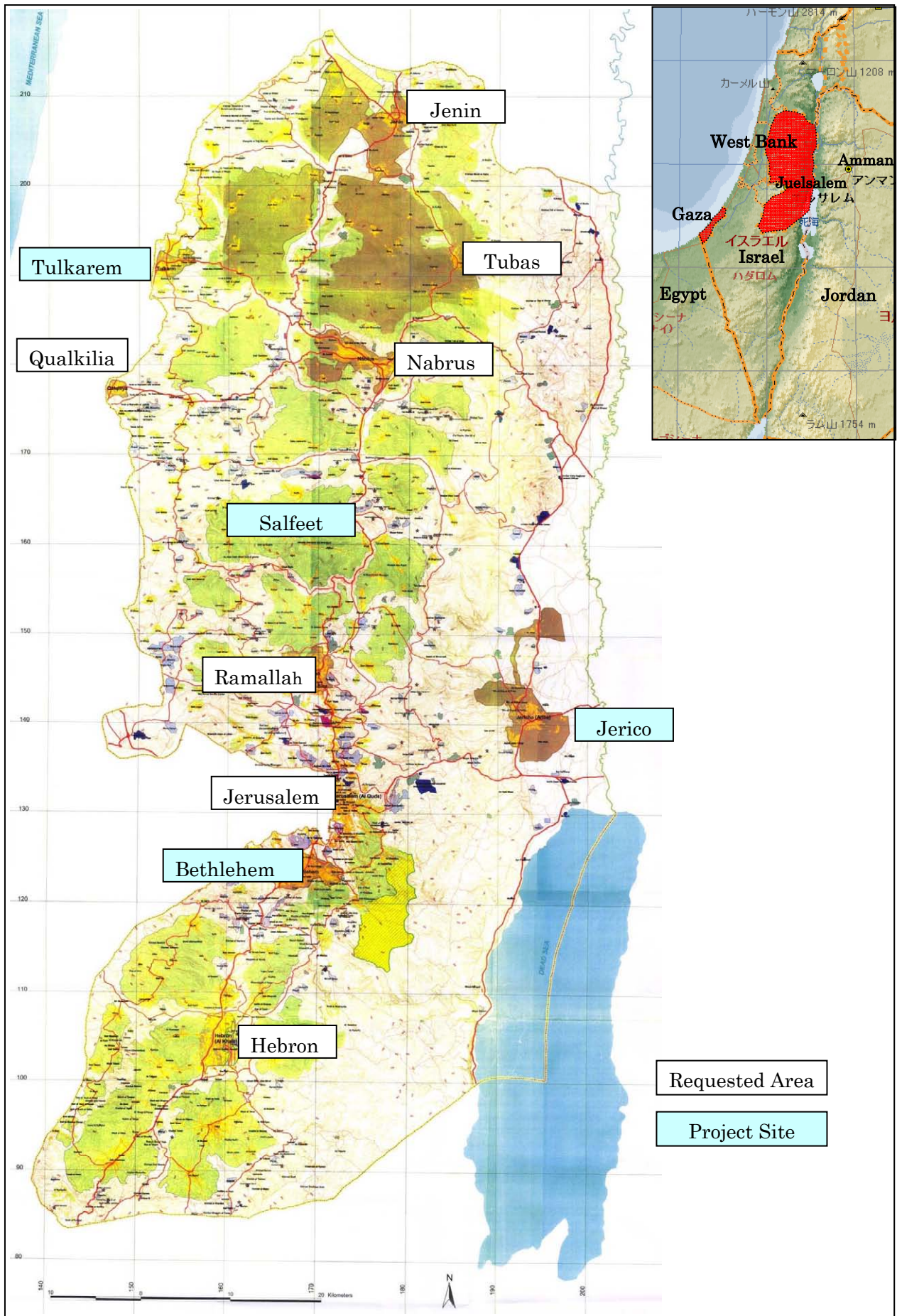
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Katsumi Fujii

Project Manager,
Basic Design Study Team on
The Project for Improvement of
Solid Waste Management(Phase 2)
Yachiyo Engineering Co., Ltd.



Location Map of Project Site

UN Office for the Coordination of Humanitarian Affairs
West Bank Closures
 August 2005

CLOSURES

Checkpoints

- Permanent Checkpoint
- Partial Checkpoint
- Other Closures
- Observation Tower
- Road Gate
- Roadblock
- Earth Mound
- Earth Wall
- Trench

Oslo Agreement

- AREA (A)
- AREA (B)
- AREA (C)
- Nature Reserve
- Special Case (H2)

Barrier

- Completed
- Under construction
- Planned Barrier
- Road protection
- Special security arrangements area
- Routes subject to completion of further ministerial examination

Barrier Gates

- Currently inaccessible for Palestinians
- Restricted access to Palestinians

Road Networks

- Prohibited Roads
- Restricted Roads
- Unrestricted Roads (Main or Regional)
- Unrestricted Roads (Other roads)

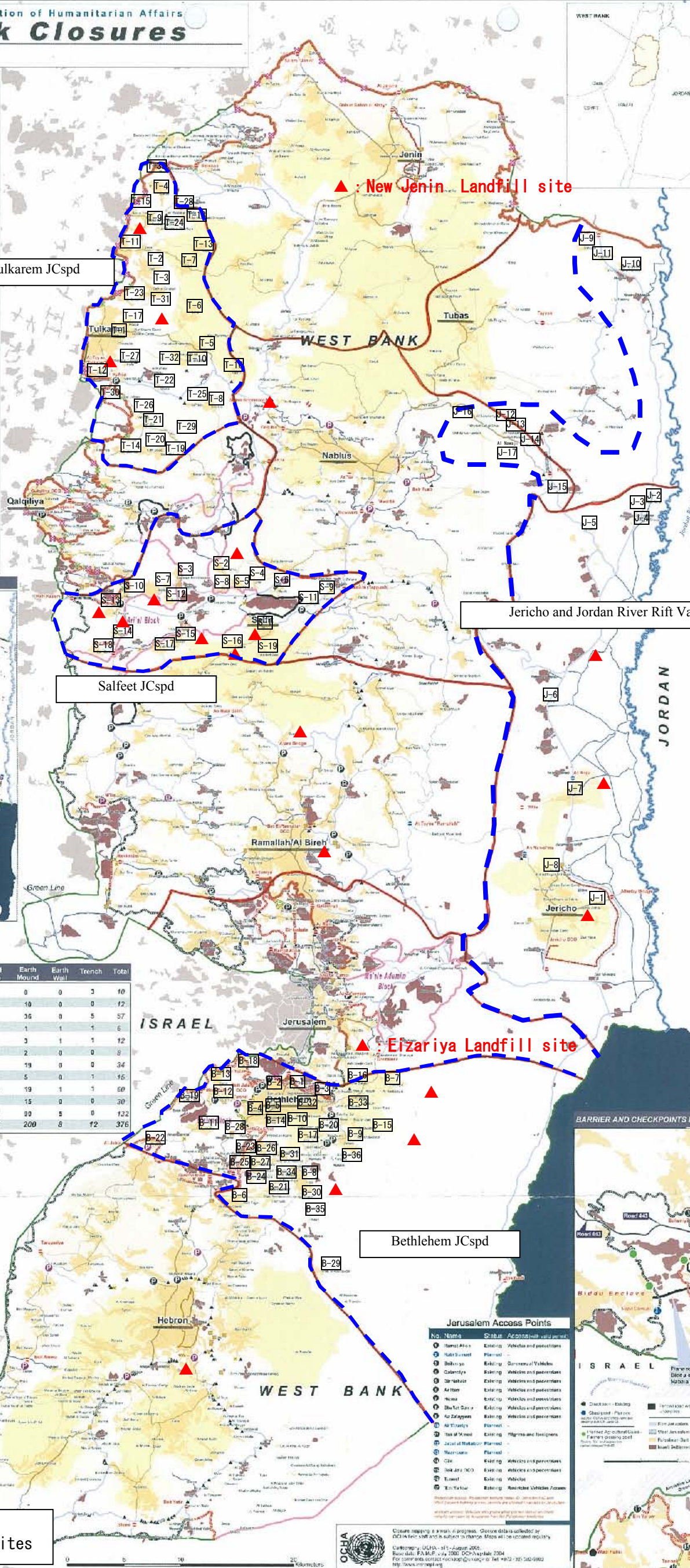
Prohibited Roads
Roads on which Israel prohibits Palestinian vehicle use.

Restricted Roads
Roads with restrictions for Palestinian vehicle use.

Unrestricted Roads
Free access for Palestinian travel.

Residential Areas

- Palestinian Built-Up Area
- Israeli Settlement
- Israeli Built-Up Area
- Planned Landmark
- Bridge
- Existing Uncongressed
- Bridge



The West Bank Barrier:
A complex series of concrete walls, electronic fences, observation towers, trenches, patrol roads and razor wire, used to control Palestinian pedestrian and vehicular movement.

Concrete Barrier (wall) - Jenin

Electronic Barrier (fence) - Bethlehem

Barrier Gate - Tulkarem
BARRIER GATE - Allows restricted movement through the West Bank Barrier to Palestinian lands and to Israel. Permission is required for Palestinians to pass through a gate. BARRIER GATE - Currently inaccessible for Palestinians.

Closure:
A policy of physical barriers and permit requirements used to control Palestinian pedestrian and vehicular movement.

CHECKPOINT - A barrier manned by IDF and/or Border Police with observation towers and other physical blocks used to control pedestrian and vehicular access.

PARTIAL CHECKPOINT - An established checkpoint operating periodically.

OBSERVATION TOWER - An elevated military post for Palestinian pedestrian (Qalqilya).

EARTH MOUND - A mound of rubble, dirt and/or rocks used to obstruct vehicle access (Bethlehem).

TUNNEL - Passage under road restricted for Palestinian use (Qalqilya).

ROADBLOCK - A series of 1 metre high concrete blocks used to obstruct vehicle access (Nablus).

TRENCH - A ditch used to prevent vehicle crossing (Nablus).

ROAD GATE - A metal gate, often manned by IDF, used to control movement along roads (Hebron).



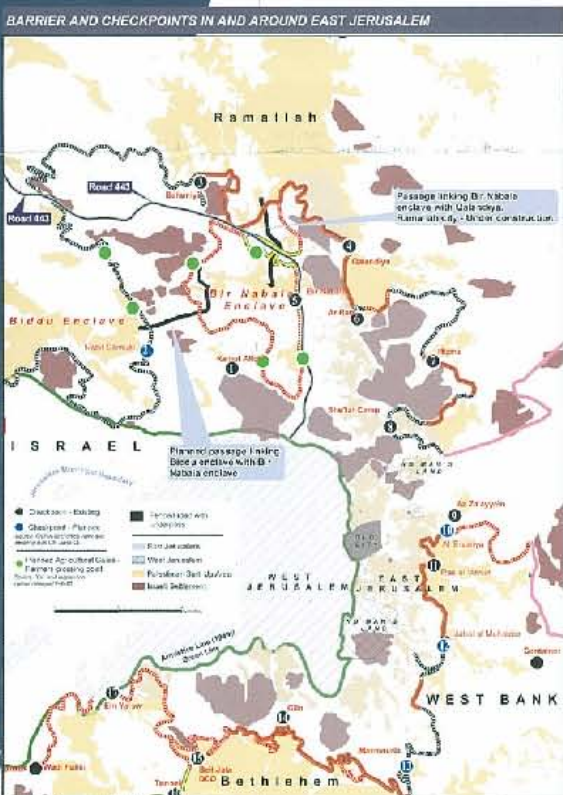
Governorate	Checkpoint	Partial Checkpoint	Roadblock	Road Gate	Earth Mound	Earth Wall	Trench	Total
Jenin	4	0	1	2	0	0	0	10
Tulkarem	2	0	0	0	10	0	0	12
Nablus	3	1	3	4	36	0	5	57
Tubas	2	0	0	1	1	1	1	6
Salfet	3	0	2	2	3	1	1	12
Qalqilya	2	1	2	1	2	0	0	8
Jerusalem	3	0	6	1	19	0	0	34
Jericho	3	2	3	1	5	0	1	15
Ramallah	5	3	19	12	19	1	1	60
Bethlehem	9	0	2	4	15	0	0	20
Hebron	6	0	11	20	30	5	0	132
Total	52	7	49	48	200	8	12	376

Closures in Hebron - H2

Checkpoints	17
Inner city gates	7
Road blocks	
Roadblock	9
Concrete road blocks	23
Iron gates	14
Barriers	12
Earth mounds	12
Total of closures:	101

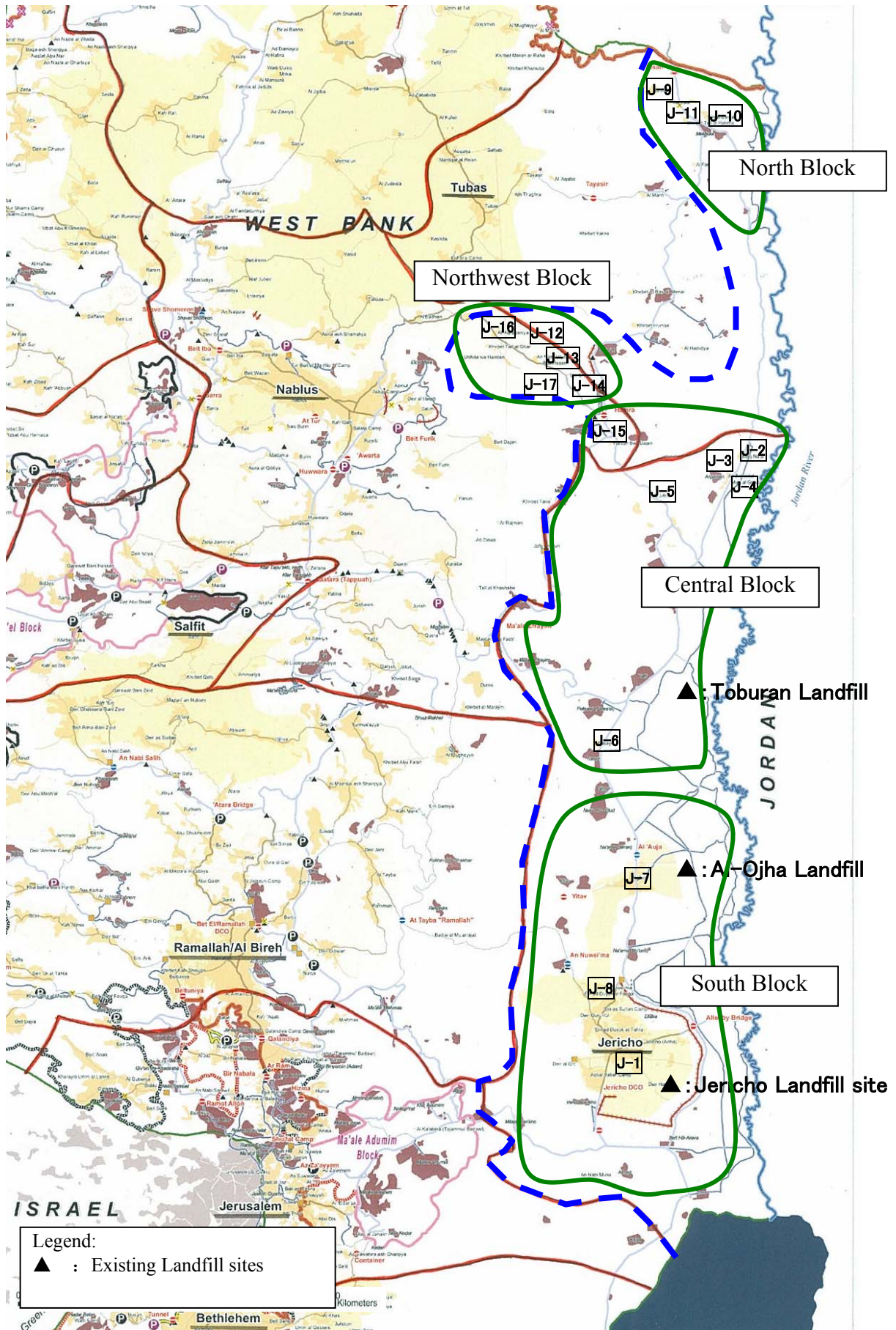
Jerusalem Access Points

No.	Name	Status	Access
1	Har Hadyar	Existing	Pedestrian and passenger
2	Har Hadyar	Planned	Pedestrian and passenger
3	Bethlehem	Existing	Commercial vehicles
4	Colony	Existing	Pedestrian and passenger
5	Al-Ram	Existing	Pedestrian and passenger
6	Har Hadyar	Existing	Pedestrian and passenger
7	Al-Zuhayr	Existing	Pedestrian and passenger
8	Al-Zuhayr	Existing	Pedestrian and passenger
9	Al-Zuhayr	Existing	Pedestrian and passenger
10	Al-Zuhayr	Existing	Pedestrian and passenger
11	Al-Zuhayr	Existing	Pedestrian and passenger
12	Al-Zuhayr	Existing	Pedestrian and passenger
13	Al-Zuhayr	Existing	Pedestrian and passenger
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30	Al-Zuhayr	Existing	Pedestrian and passenger
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47	Al-Zuhayr	Existing	Pedestrian and passenger
48	Al-Zuhayr	Existing	Pedestrian and passenger
49	Al-Zuhayr	Existing	Pedestrian and passenger
50	Al-Zuhayr	Existing	Pedestrian and passenger

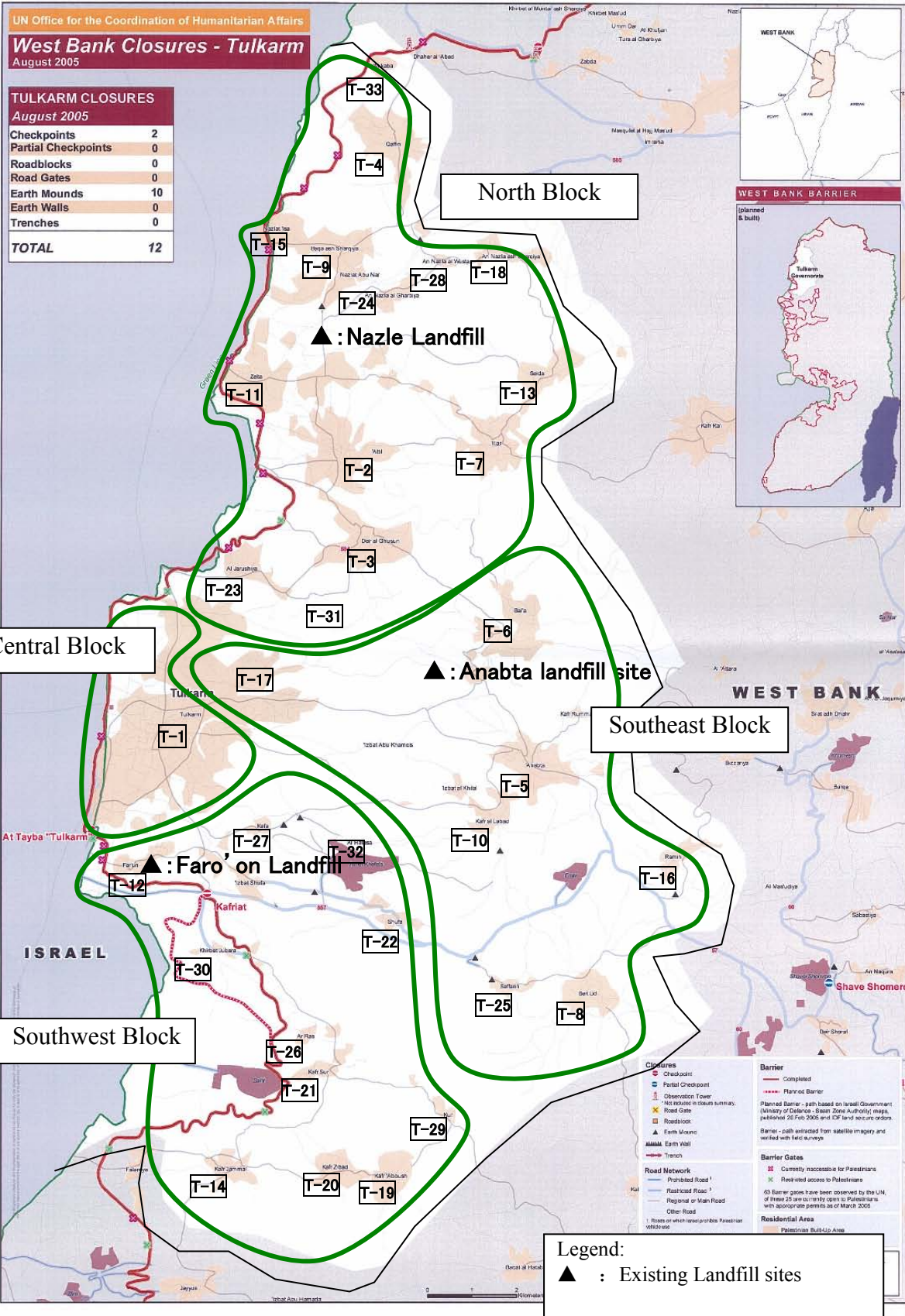


Legend
 ▲ : Main Landfill sites

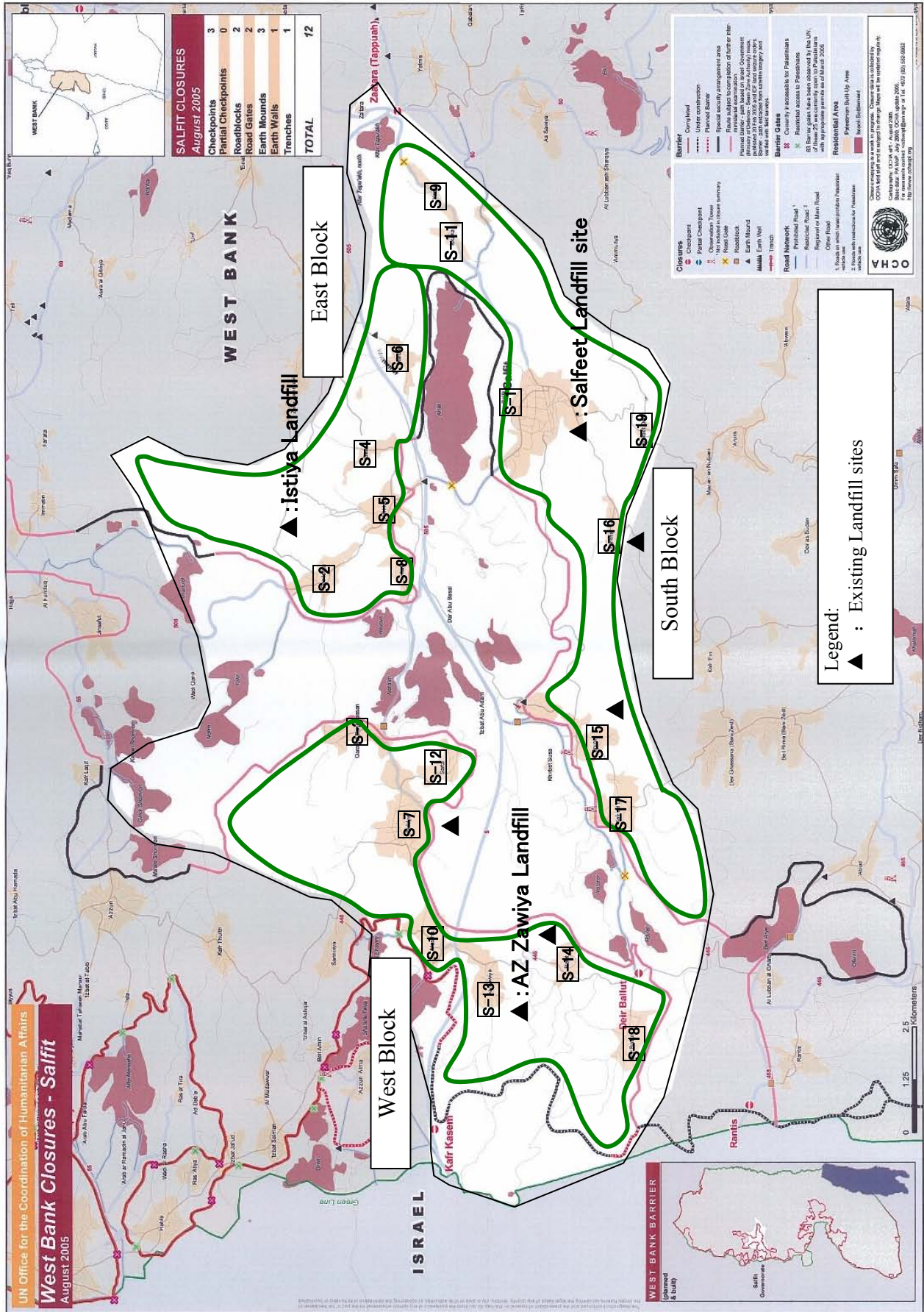
Location Map of Target JCspd



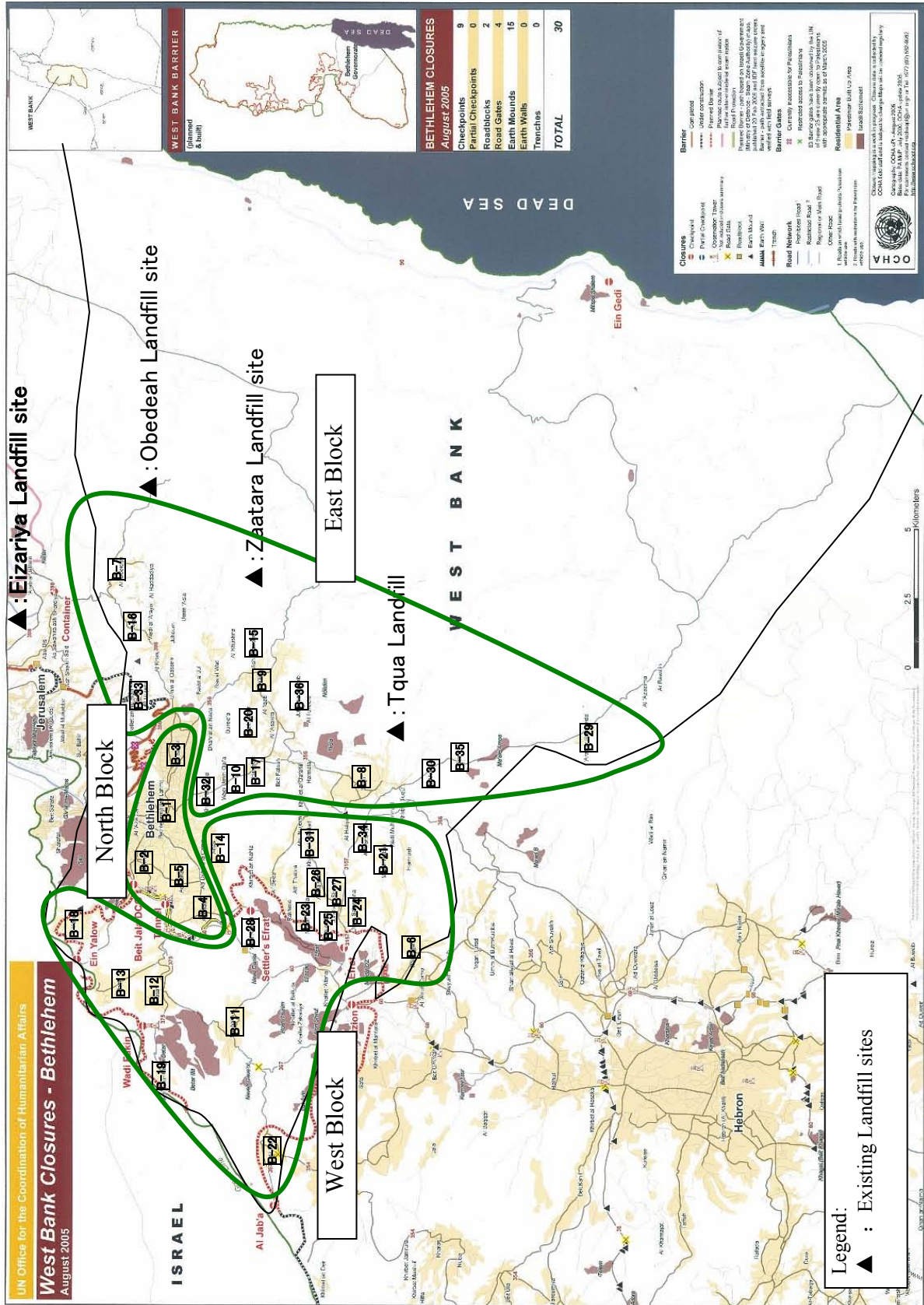
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Map of Tulkarem JCspd



Map of Salfet JCspd



Map of Bethlehem JCspd

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Abbreviations

E/N	Exchange of Notes
EIA	Environmental Impact Assessment
EQA	Environment Quality Authority
F/S	Feasibility Study
GDP	Gross Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
JCspd	Joint Council for Services, Planning and Development
JICA	Japan International Cooperation Agency
JSC	Joint Service Council
KFW	Kreditanstalt für Wiederaufbau
M/D	Minutes of Discussion
MOLG	Ministry of Local Government
NIS	New Israel Sheqel
NGO	Non Governmental Organization
OJT	On the Job Training
PNA	Palestinian National Authority
UNV	United Nation Volunteer
UNDP	United Nations Development Programme

SUMMARY

SUMMARY

Each municipality shall carry out solid waste management in the Palestinian National Authority (hereafter referred to as “PNA”). However, since many local authorities are small in scale, their finances are vulnerable and securing landfill site lot is difficult. It is in a difficult situation to carry out waste collection and disposal appropriately. For this reason, problems such as illegal disposal, open dumped discarded waste in the suburbs and/or the vacant lot have occurred. Therefore the early remedial measure for the environmental sanitation deterioration shall be required.

Ministry of Local Government (hereafter referred to as “MOLG”) in the PNA, which supports the solid waste management of local authorities, has summarized the needs concerning facilities/equipment required for the solid waste management from each local authority, and has requested the grant aid concerning procurement of waste management equipment and provision of landfill site to the Government of Japan.

The Government of Japan dispatched the preliminary study team of Japan International Cooperation Agency (hereinafter referred to as “JICA”) to this request in August 2005 for confirmation of the background, the necessity and validity of the request. According to result of the preliminary study, the contents of the request (project site, specification and quantity of equipments, etc.) have become clear, and the necessity and validity of cooperation have been confirmed. Moreover, it has been agreed that the requested equipment will be provided to Joint Council for service, planning and development (hereafter referred to as “JCspd”) to be regional solid waste management agency for more effective solid waste Management.

Based on the recommendation of the above-mentioned preliminary study, JICA decided to conduct this basic design study, and dispatched a study team from November 27, 2005 to December 28.

Firstly the study team has made a short list of project site at Jericho and Jordan River Rift Valley JCspd, Tulkarem JCspd, Salfeet JCspd, and Bethlehem JCspd in a result of deliberations with the PNA’s related officers including MOLG. Then the study team has carried out to confirm the contents of the request and survey on actual situation of the solid waste management in the short listed JCspds.

Based on the survey and analysis works, the Basic Design Report has been concluded. However, an explanation of the Draft Basic Design Report has not been done in this Basic Design Study.

The outline of the basic design of the project is as follows.

a. Design Conditions

- Target year: 2010
- Project area: Jericho and Jordan River Rift Valley JCspd, Tulkarem JCspd, Salfeet JCspd, and Bethlehem JCspd
- Project waste: Municipal solid wastes
- Amount of collected waste: As shown in Table-1.

Table-1 Amount of Collected Waste

Item	Jericho and Jordan	Tulkarem JCspd	Salfeet JCspd	Bethlehem JCspd
Population (Pearson)	47,971	166,054	72,073	205,070
Average garbage generating rate	1.38	1.23	1.01	1.04
Generated waste amount (t/day)	66.1	204.3	72.9	212.9
Waste collection rate (%)	90%	90%	90%	90%
Collected waste amount (t/day)	59.7	184.2	65.7	192.1

b. The contents of planed equipment

The contents of planed equipment are shown in Table-2.

Table-2 List of Planed Equipment

Unit: Number of equipment

Item	Jericho and Jordan	Tulkarem JCspd	Salfeet JCspd	Bethlehem JCspd	Total
8m ³ compactor vehicle	4	0	3	3	10
12m ³ compactor	0	16	0	13	29
8m ³ container transfer	1	0	0	0	1
15m ³ garbage damp	0	4	0	0	4
2m ³ wheel loader	0	2	0	0	2
1.1m ³ container	234	675	336	840	2,085
8m ³ container	10	0	0	0	10
1m ³ backhoe loaders	1	0	0	0	1
13t soil damp truck	1	0	0	0	1
Spare parts (Unit)	1	1	1	1	4

c. Project Cost

- Total Cost : 665 million yen
- Japanese side burden project cost: 665 million yen (as shown in Table-3 for details)

Table-3 Japanese Side Burden Project Cost

Item		Project cost (mil. yen)	
Equipment	Jericho and Jordan River	84	649
	Tulkarem JCspd	298	
	Salfeet JCspd	38	
	Bethlehem JCspd	229	
Detail design	Procurement	16	

- Palestine burden project cost: 16,170NIS (Approx. 0.4 million yen) for transportation of supplied equipments in the West Bank
- Calculation conditions: 1US\$=113.50 yen, 1NIS=24.85 yen, 1EUR=137.60 yen (December, 2005)

The implementation agencies of the Project are 4 JCspds established in 2005 of Jericho and Jordan River Rift Valley, Tulkarem, Salfeet, and Bethlehem. The waste collection area for each JCspd is set up based on the governorate. Although they consist of mainly governorate capital city and urban areas in where almost of all waste is collected, rural area where garbage collection is hardly carried out is included. However, the leader of JCspd is the mayor of local authority where waste collection is performed properly, so it is expected that know-how on waste collection will be transferred to the waste collection in rural area.

On the other hand, it may occur that direct waste transportation to landfill site by waste collection vehicles may become inefficient, because landfill site becomes far due to introducing regional and wider area waste management system. The equipment plan for such area has been designed to introduce transfer system with easy management and simple maintenance measures.

This project is significant as grant aid because of large effectiveness, capable local technique for operation and maintenance and appropriate scale for implementation.

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