

List of contents

Dedication.....	iii
Acknowledgments.....	iv
Abstract.....	v
المخلص.....	vii
List of contents.....	ix
List of Tables.....	xiii
List of figures.....	xiv
List of Abbreviations.....	xvi
1. Chapter One:	
Introduction.....	1
1.1 Research out line.....	1
1.2 Introduction.....	1
1.3 Municipal solid waste management.....	2
1.3.1 Waste management costs.....	3
1.3.2 Waste production.....	4
1.3.3 Classification of solid waste.....	5
1.3.4 Solid waste disposal.....	6
1.3.4.1 Open dumps	9
1.3.4.2 Controlled dumps.....	10
1.3.4.3 Sanitary landfill.....	11
1.4 Effects of waste management activities	12
1.5 Impacts on environmental factors.....	15
1.5.1 Impacts on water.....	15
1.5.2 Impacts on air.....	15
1.5.3 Impacts on soil	15
1.5.4 Impacts on humans.....	16
1.6 Difficulties of measuring environmental impact.....	17
1.7 Main pollutants from landfill site.....	17
1.7.1 Leachate.....	17

1.7.1.1 Young leachate.....	18
1.7.1.2 Old leachate.....	19
1.7.2 Landfill gases	20
1.7.2.1 Landfill gases problems.....	21
1.7.3 Remedial methods.....	22
1.8 Strategic planning issues of SWM.....	23
1.9 Life cycle assessment	23
1.10 Problems of MSWM.....	25
1.11 Solid waste management in Palestine.....	27
1.12 Characteristics of the study area (Jenin district).....	29
1.12.1 Location.....	29
1.12.2 Population.....	30
1.12.3 Topography.....	31
1.12.4 Soil	31
1.12.5 Vegetation and land use.....	31
1.12.6 Hydrology.....	32
1.12.6.1 Water resources (Springs and wells).....	32
1.12.6.2 Precipitation.....	32
1.12.7 Climate.....	32
1.12.7.1 Temperature.....	33
1.12.7.2 Humidity.....	34
1.12.7.3 Wind	34
1.13 Joint Services Council.....	34
1.14 Zahret Alfenjan landfill.....	36
1.15 Objectives.....	38
2. Chapter Two: Methodology.....	39
2.1 The Stakeholder survey.....	39
2.2 The household survey	40
2.2.1 Estimation of sample size and distribution.....	42
2.3 Collection data of leachate and gas samples.....	43

3. Chapter Three: Results and Discussion.....	44
3.1 Existing system for SWM in Jenin district.....	44
3.1.1 Localities distribution based on the responsible of waste collection service.....	44
3.1.2 Laws and regulations.....	45
3.1.3 Financial issues.....	45
3.1.4 Collection system.....	46
3.1.4.1 Staff of the solid waste sector.....	46
3.1.4.2 Equipments.....	47
3.1.4.3 Amount and frequency of waste collection.....	50
3.1.5 Disposal system.....	50
3.1.5.1 Transfer stations.....	51
3.2 Zahrat Alfenjan landfill.....	53
3.2.1 Solid waste quantities.....	4
3.2.2 Solid waste fees.....	55
3.2.3 Components of solid waste.....	56
3.2.4 Waste separation, reuse, and recycle.....	58
3.2.5 Environmental control.....	60
3.2.6 Leachate system.....	63
3.2.6.1 Results of leachate samples from ZAL.....	66
3.2.7 Gas system.....	68
3.2.8 Closure of the Landfill	71
3.3 Demographics of the study area.....	72
3.4 Citizens opinion of services provided by councils for MSWM.....	75
3.4.1 Collection system.....	75
3.4.1.1 Service provider.....	75
3.4.1.2 Solid waste fee system.....	76
3.4.1.3 Solid waste generation	77
3.4.1.4 Frequency of waste collection.....	78
3.4.1.5 Equipments of collection system.....	80
3.4.2 Evaluation of road sweeping.....	83

3.5 Environmental concerns and awareness.....	84
3.5.1 Residents received public awareness campaigns	85
3.5.2 Residents willing to work in MSWM sector	86
3.5.3 Reuse and recycling concerns	87
3.6 Disposal system.....	89
 4. Chapter Four: Conclusion and Recommendation.....	90
4.1 Collection system.....	90
4.2 Environmental awareness.....	91
4.3 Integrated SWM.....	92
4.4 The most important obstacles that hinder the councils from performing its role efficiently..	93
4.5 Recommendation.....	94
 5. References.....	96
 6. Appendices.....	104
Appendix A: Distribution of household survey.....	104
Appendix B: Stakeholder questionnaire.....	106
Appendix C: Household questionnaire.....	114
Appendix D: Zahrat Alfenjan landfill.....	119
Appendix E: Leachate samples.....	128
Appendix F: Gas samples.....	133