Kimmage to City Centre Core Bus Corridor Scheme June 2023

Environmental Impact Assessment Report

Volume 2Main Chapters —
Table of Contents



SUSTAINABLE TRANSPORT FOR A BETTER CITY.



Table of Contents - Volume 2

Section	Title	Page Number
Glossary		
N/A	Glossary of Terminology, Abbreviations and Acronyms	1
Chapter 1 (Introduction	on)	
1.1	Introduction	1
1.2	Aim and Objectives	3
1.3	Delivery of the Project	4
1.4	Role of the National Transport Authority	4
1.5	EIAR Process, Screening, Content and Methodology	5
1.5.1	Introduction	5
1.5.2	Relevant Legislation, Policy and Guidelines	5
1.5.3	EIA Process	7
1.5.4	Screening and the Legislative Requirement for EIA	7
1.5.5	Consideration of the EIAR Scope	8
1.5.6	Contents of the EIAR	8
1.5.7	EIAR Structure	10
1.5.8	Assessment Scenarios	12
1.5.9	Assessment Criteria	13
1.5.10	Details of Competent Experts	14
1.6	Consultation	22
1.6.1	Consultation Objectives	22
1.6.2	Emerging Preferred Route Option Consultation	22
1.6.3	Preferred Route Option Consultations	24
1.7	Consultation with Prescribed Bodies and Other Consultees	26
1.7.1	Prescribed Bodies and Interested Parties	26
1.7.2	Landowners	27
1.8	Difficulties Encountered During the Preparation of the EIAR	28
1.9	References	39
Chapter 2 (Need for th	ne Proposed Scheme)	
2.1	Introduction	1
2.2	Transport Need for the Proposed Scheme	2
2.2.1	The Regional Transport Need	2
2.2.2	The Local Transport Need	15
2.3	Policy Context	19
2.3.1	International Policy	19
2.3.2	European Union Law and Policy	20
2.3.3	National Policy	21
2.3.4	Regional Policy	41
2.3.5	Local Policy	52
2.4	Benefits of the Proposed Scheme	62
2.5	References	66
Chapter 3 (Considerate	tion of Reasonable Alternatives)	
3.1	Environmental Impact Assessment Directive Requirements	1
3.2	Strategic Alternatives	2
3.2.1	Overview of the Transport Strategy for the Greater Dublin Area 2016 – 2035 and the New Greater Dublin Area Transport Strategy 2022-2042	2
3.2.2	Transport Strategy for the Greater Dublin Area 2016 – 2035	2
3.2.3	'Do Nothing' Alternative	5
0.2.0	Do Nothing Alternative	Ü



Section	Title	Page Number
3.2.5	Light Rail Alternative	6
3.2.6	Metro Alternatives	8
3.2.7	Heavy Rail Alternative	10
3.2.8	Demand Management Alternative 10	
3.2.9	Technological Alternatives 11	
3.3	Route Alternatives	12
3.3.1	Initial High Level Route Alternatives	13
3.3.2	Stage 2 – Route Option Assessment	15
3.3.3	Cycling Options	17
3.3.4	Emerging Preferred Route	18
3.4	Design Alternatives	18
3.4.1	Development of the Draft Preferred Route Option	18
3.4.2	Consideration Following Preferred Route Option Consultation (March 2020)	21
3.4.3	Further Consideration Following Preferred Route Option Consultation (November 2020)	22
3.5	Conclusion	23
3.6	References	24
Chapter 4 (Proposed S	Scheme Description)	
4.1	Introduction	1
4.2	Proposed Scheme Overview	1
4.3	Design Iteration	3
4.4	Design Principles	3
4.5	Description of the Proposed Scheme by Section	4
4.5.1	Section 1 – Lower Kimmage Road from Kimmage Cross Roads to Junction with Harold's Cross Road	4
4.5.2	Section 2 – Harold's Cross Road from Harold's Cross Park to Grand Canal	11
4.5.3	Section 3 – Clanbrassil Street Upper and Lower and New Street South from the Grand Canal to the Patrick Street Junction	15
4.6	Key Infrastructure Elements	20
4.6.1	Mainline Cross-Section	20
4.6.2	Pedestrian Provision	21
4.6.3	Cycling Provision	22
4.6.4	Bus Priority Provision	24
4.6.5	Accessibility for Mobility Impaired Users	30
4.6.6	Integration	31
4.6.7	Junctions	36
4.6.8	Structures	37
4.6.9	Other Street Infrastructure	37
4.6.10	Pavement	38
4.6.11	Parking and Loading	40
4.6.12	Landscape and Urban Realm	41
4.6.13	Lighting	44
4.6.14	Utilities	45
4.6.15	Drainage	45
4.6.16	Maintenance	49
4.6.17	Safety and Security	50
4.6.18	Land Use and Accommodation Works	50
4.7	References	51
Chapter 5 (Construction	on)	
5.1	Introduction	1
5.2	Construction Phasing	2



Section	Title	Page Number	
5.3	Overview of Construction Works	2	
5.3.1	Section 1 – Lower Kimmage Road from Kimmage Cross Roads to Junction with Harold's Cross Road	3	
5.3.2	Section 2 – Harold's Cross Road from Harold's Cross Park to Grand Canal	4	
5.3.3	Section 3 – Clanbrassil Street Upper and Lower and New Street South from the Grand Canal to the Patrick Street Junction	4	
5.4	Construction Programme	5	
5.5	Construction Methodology	6	
5.5.1	Pre-Construction	6	
5.5.2	Preparatory and Site Clearance Works	6	
5.5.3	Road and Street Upgrades	9	
5.5.4	Structural Works	11	
5.5.5	Construction Site Decommissioning	16	
5.6	Construction Plant and Equipment	16	
5.7	Construction Compounds	17	
5.7.1	Construction Compound Locations	17	
5.7.2	Construction Compound Activities	20	
5.7.3	Construction Compound Services	20	
5.8	Construction Traffic Management	21	
5.8.1	Pedestrian and Cyclist Provisions	21	
5.8.2	Public Transport Provisions	21	
5.8.3	General Traffic Provisions	22	
5.8.4	Road Closures and Diversions	28	
5.9	Interface with Other Projects	28	
5.10	Construction Environmental Management	28	
5.10.1	Construction Environmental Management Plan	28	
5.10.2	Mitigation Measures	29	
5.10.3	Construction Working Hours	30	
5.10.4	Personnel Numbers	30	
5.10.5	Construction Health and Safety	30	
5.11	Monitoring Measures	30	
5.12	References	31	
Chapter 6 (Traffic		01	
6.1	Introduction	1	
6.1.1	Aim and Objectives of the Proposed Scheme	2	
6.1.2	Iterative Design Process and Mitigation by Design	4	
6.2	Methodology	5	
6.2.1	Study Area	5	
6.2.2	Relevant Guidelines, Policy and Legislations	6	
6.2.3	Proposed Scheme Impact Assessment Modelling Tools	8	
6.2.4	Appraisal Method for the Assessment of Impacts	9	
6.2.5	Data Collection and Collation	13	
6.3	Baseline Environment	16	
6.3.1	Overview	16	
6.3.2	Section 1 – Lower Kimmage Road from Kimmage Cross Roads to Junction with Harold's Cross Road	17	
6.3.3	Section 2 – Harold's Cross Road from Harold's Cross Park to Grand Canal	28	
6.3.4	Section 3 – Clanbrassil Street Upper and Lower and New Street South from the Grand Canal to the Patrick Street Junction	32	
6.4	Potential Impacts	38	
6.4.1	Characteristics of the Proposed Scheme	38	
		00	



Section	Title	Page Number
6.4.2	Do Nothing Scenario	38
6.4.3	Do Minimum Scenario	38
6.4.4	Do Something Scenario	40
6.4.5	Construction Phase	40
6.4.6	Operational Phase	46
6.5	Mitigation and Monitoring Measures	107
6.5.1	Construction Phase	107
6.5.2	Operational Phase	107
6.6	Residual Impacts	107
6.7	References	108
Chapter 7 (Air Quality)		
7.1	Introduction	1
7.2	Methodology	1
7.2.1	Study Area	2
7.2.2	Relevant Guidelines, Policy and Legislation	3
7.2.3	Data Collection and Collation	7
7.2.4	Appraisal Method for the Assessment of Impacts	7
7.3	Baseline Environment	20
7.3.1	Meteorological Conditions	20
7.3.2	Baseline Ambient Air Quality	21
7.3.3	Existing Modelled Baseline Scenario	27
7.4	Potential Impacts	29
7.4.1	Characteristics of the Proposed Scheme	29
7.4.2	Construction Phase	29
7.4.3	Operational Phase	39
7.5	Mitigation and Monitoring Measures	50
7.5.1	Construction Phase	50
7.5.2	Operational Phase	51
7.6	Residual Impacts	51
7.6.1	Construction Phase	51
7.6.2	Operational Phase	51
7.7	References	52
Chapter 8 (Climate)		
8.1	Introduction	1
8.2	Climate Assessment Considerations	2
8.3	Methodology	3
8.3.1	Study Area	3
8.3.2	Relevant Guidelines, Policy and Legislation	4
8.3.3	Data Collection and Collation	9
8.3.4	Appraisal Method for the Assessment of Impacts	9
8.4	Baseline Environment	14
8.4.1	Climate Pollutants	14
8.4.2	Vulnerability of the Proposed Scheme to Climate Change	14
8.4.3	Existing GHG Emissions Baseline	18
8.5	Potential Impacts	20
8.5.1	Construction Phase	20
8.5.2	Operational Phase	23
8.6	Sensitivity Analysis	33
8.6.1	Introduction	33



Section	Title	Page Number
8.6.2	Sensitivity Test	33
8.7	Mitigation and Monitoring Measures	36
8.7.1	Construction Phase	36
8.7.2	Operational Phase	36
8.8	Residual Impacts	37
8.8.1	Construction Phase	37
8.8.2	Operational Phase	37
8.9	References	38
Chapter 9 (Noise & Vil		
9.1	Introduction	1
9.2	Methodology	1
9.2.1	Study Area	2
9.2.2	Relevant Guidelines, Policy and Legislation	3
9.2.3	Data Collection and Collation	4
9.2.4	Appraisal Method for the Assessment of Impacts	6
9.3	Baseline Environment	17
9.3.1	Desk Study of Published Noise Data	17
9.3.2	Baseline Noise Surveys	18
9.3.3	Baseline Vibration Surveys	21
9.4	Potential Impacts	23
9.4.1	Characteristics of the Proposed Scheme	23
9.4.2	'Do Minimum' Scenario	24
9.4.3	Construction Phase	24
9.4.4	Operational Phase	43
9.5	Mitigation and Monitoring Measures	50
9.5.1	Construction Phase	50
9.5.2	Operational Phase	56
9.6	Residual Impacts	56
9.6.1	Construction Phase	56
9.6.2	Operational Phase	57
9.7	References	58
Chapter 10 (Populatio	n)	
10.1	Introduction	1
10.2	Methodology	2
10.2.1	Study Area	2
10.2.2	Relevant Guidelines, Policy and Legislation	3
10.2.3	Data Collection and Collation	3
10.2.4	Appraisal Method for the Assessment of Impacts	4
10.3	Baseline Environment	10
10.3.1	Overview	10
10.3.2	Community Baseline	11
10.3.3	Economic Baseline	13
10.4	Potential Effects	14
10.4.1	Characteristics of the Proposed Scheme	14
10.4.2	'Do Nothing' Scenario	15
10.4.3	Construction Phase	15
10.4.4	Operational Phase	22
10.5	Mitigation and Monitoring Measures	29
10.6	Residual Impacts	29



Section	Title	Page Number
10.6.1	Construction Phase	29
10.6.2	Operational Phase	31
10.7	References	33
Chapter 11 (Human He	ealth)	
11.1	Introduction	1
11.2	Methodology	1
11.2.1	Study Area	2
11.2.2	Relevant Guidelines, Policy and Legislation	2
11.2.3	Data Collection and Collation	6
11.2.4	Appraisal Method for the Assessment of Impacts	6
11.3	Baseline Environment	10
11.3.1	General Health	10
11.3.2	Deprivation, Disability and Health Inequalities	13
11.3.3	Air Quality, Noise and Other Pollutants	17
11.3.4	Traffic, Travel Behaviour and Health	19
11.3.5	Access to Healthcare, Employment and Education	21
11.3.6	Communicable Diseases	22
11.3.7	Summary of Key Baseline Health Issues	22
11.4	Potential Impacts	23
11.4.1	Characteristics of the Proposed Scheme	23
11.4.2	'Do Nothing' Scenario	24
11.4.3	Construction Phase	24
11.4.4	Operational Phase	29
11.5	Mitigation and Monitoring Measures	35
11.5.1	Construction Phase	35
11.5.2	Operational Phase	35
11.6	Residual Impacts	36
11.6.1	Construction Phase	36
11.6.2	Operational Phase	36
11.7	Difficulties Encountered in Compiling Information	37
11.8	References	38
Chapter 12 (Biodivers	ity)	
12.1	Introduction	1
12.2	Methodology	1
12.2.1	Ecological Survey Study Area	2
12.2.2	Relevant Guidelines, Policy and Legislation	2
12.2.3	Data Collection and Collation	4
12.2.4	Appraisal Method for the Assessment of Impacts	8
12.3	Baseline Environment	11
12.3.1	Zone of Influence (ZoI)	11
12.3.2	Desk Study	13
12.3.3	Biodiversity Areas	13
12.3.4	Designated Areas for Nature Conservation	14
12.3.5	Habitats	24
12.3.6	Rare and Protected Plant Species	29
12.3.7	Non-Native Invasive Plant Species	30
12.3.8	Mammals	30
12.3.9	Birds	35
12.3.10	Reptiles	40



Section	Title	Page Number
12.3.11	Amphibians	40
12.3.12	Fish	41
12.3.13	Invertebrates	42
12.3.14	Summary Ecological Valuation and Identification of KERs	44
12.4	Potential Impacts	47
12.4.1	Characteristics of the Proposed Scheme	47
12.4.2	'Do Nothing' Scenario	53
12.4.3	Construction Phase	54
12.4.4	Operational Phase	83
12.5	Mitigation and Monitoring Measures	96
12.5.1	Construction Phase	96
12.5.2	Operational Phase	107
12.6	Residual Impacts	110
12.6.1	Construction Phase	110
12.6.2	Operational Phase	113
12.7	References	115
Chapter 13 (Water)		<u> </u>
13.1	Introduction	1
13.2	Methodology	2
13.2.1	Study Area	2
13.2.2	Relevant Guidelines, Policy and Legislation	2
13.2.3	Data Collection and Collation	4
13.2.4	Appraisal Method for the Assessment of Impacts	5
13.3	Baseline Environment	11
13.3.1	WFD Catchment Overview	11
13.3.2	EPA Surface Water Monitoring	11
13.3.3	Surface Water WFD Status	11
13.3.4	Field Survey	12
13.3.5	Designated Sites	15
13.3.6	Drinking Water Supply (Surface Water)	16
13.3.7	Known Pressures	16
13.3.8	Existing Drainage	16
13.3.9	Surface Water Features	17
13.3.10	Summary of Baseline Receptor Sensitivity	19
13.3.11	Flood Risk	19
13.4	Potential Impacts	20
13.4.1	Characteristics of the Proposed Scheme	20
13.4.2	'Do Nothing' Scenario	22
13.4.3	Do Minimum	23
13.4.4	Construction Phase	24
13.4.5	Operational Phase	28
13.4.6	Summary of Flood Risk Assessment	29
13.5	Mitigation and Monitoring Measures	30
13.5.1	Introduction	30
13.5.2	Construction Phase	30
13.5.3	Operational Phase	32
13.6	Residual Impacts	33
13.6.1	Construction Phase	33
13.6.2	Operational Phase	33



Section	Title	Page Number
13.6.1	Summary of WFD Assessment	33
13.7	References	35
Chapter 14 (Land, Soi	ils, Geology & Hydrogeology)	
14.1	Introduction	1
14.2	Methodology	1
14.2.1	Study Area	1
14.2.2	Relevant Guidelines, Policy and Legislation	2
14.2.3	Data Collection and Collation	2
14.2.4	Appraisal Method for the Assessment of Impacts	5
14.3	Baseline Environment	8
14.3.1	Introduction	8
14.3.2	Regional Overview	8
14.3.3	Site-Specific Environment	15
14.3.4	Summary of Features of Importance	25
14.3.5	Conceptual Site Model	28
14.4	Potential Impacts	31
14.4.1	Characteristics of the Proposed Scheme	31
14.4.2	'Do Nothing' Scenario	32
14.4.3	Construction Phase	32
14.4.4	Operational Phase	38
14.5	Mitigation and Monitoring Measures	38
14.5.1	Construction Phase	38
14.5.2	Operational Phase	44
14.6	Residual Impacts	44
14.6.1	Construction Phase	44
14.6.2	Operational Phase	44
14.7	References	45
Chapter 15 (Archaeole	ogical & Cultural Heritage)	
15.1	Introduction	1
15.2	Methodology	1
15.2.1	Introduction	1
15.2.2	Study Area	3
15.2.3	Relevant Guidelines, Policy and Legislation	3
15.2.4	Data Collection and Collation	4
15.2.5	Appraisal Method for the Assessment of Impacts	5
15.3	Baseline Environment	7
15.3.1	Archaeological and Historical Background	7
15.3.2	Archaeological Heritage: Lower Kimmage Road from Kimmage Cross Roads to Junction with Harold's Cross Road	18
15.3.3	Archaeological Heritage: Harold's Cross Road from Harold's Cross Park to Grand Canal	22
15.3.4	Archaeological Heritage: Clanbrassil Street Upper and Lower and New Street South from the Grand Canal to the Patrick Street Junction	24
15.3.9	Proposed Construction Compounds	28
15.4	Potential Impacts	30
15.4.1	Characteristics of the Proposed Scheme	30
15.4.2	'Do Nothing' Scenario	30
15.4.3	Construction Phase	30
15.4.4	Operational Phase	36
15.5	Mitigation and Monitoring Measures	36
15.5.1	Construction Phase	36



Section	Title	Page Number
15.5.2	Operational Phase	42
15.6	Residual Impacts	42
15.6.1	Construction Phase	42
15.6.2	Operational Phase	42
15.7	References	43
Chapter 16 (Architectu	ural Heritage)	
16.1	Introduction	1
16.2	Methodology	1
16.2.1	Definitions	1
16.2.2	Approach	3
16.2.3	Study Area	4
16.2.4	Relevant Legislation, Policy and Guidelines	4
16.2.5	Data Collection and Collation	6
16.2.6	Assessment Methodology	7
16.2.7	Appraisal Method for the Assessment of Sensitivity	7
16.3	Baseline Environment	13
16.3.1	Results and Analysis	16
16.4	Potential Impacts	36
16.4.1	Characteristics of the Proposed Scheme	36
16.4.2	'Do Nothing' Scenario	36
16.4.3	Construction Phase	36
16.4.4	Operational Phase	44
16.5	Mitigation and Monitoring Measures	46
16.5.1	Construction Phase	46
16.5.2	Operational Phase	54
16.6	Residual Impacts	56
16.6.1	Construction Phase	56
16.6.2	Operational Phase	56
16.7	References	57
Chapter 17 (Landscap	e (Townscape) & Visual)	
17.1	Introduction	1
17.2	Methodology	1
17.2.1	Study Area	1
17.2.2	Relevant Legislation, Policy and Guidelines	2
17.2.3	Data Collection and Collation	3
17.2.4	Appraisal Method for the Assessment of Impacts	4
17.3	Baseline Environment	13
17.3.1	City Context	13
17.3.2	Overview of Route of the Proposed Scheme	13
17.3.3	Landscape, Townscape and Visual Planning Policy	14
17.3.4	Townscape / Streetscape Character	15
17.4	Potential Impacts	17
17.4.1	Characteristics of the Proposed Scheme	17
17.4.2	'Do Nothing' Scenario	22
17.4.3	Construction Phase	22
17.4.4	Operational Phase	28
17.5	Mitigation and Monitoring Measures	34
17.5.1	Construction Phase	34
17.5.2	Operational Phase	37



Section	Title	Page Number
17.6	Residual Impacts	42
17.6.1	Construction Phase	42
17.6.2	Operational Phase	43
17.7	Conclusion	44
17.8	References	46
Chapter 18 (Waste &	Resources)	
18.1	Introduction	1
18.2	Sustainable Resource and Waste Management Principles	2
18.2.1	Circular Economy	2
18.2.2	The Waste Hierarchy	3
18.3	Methodology	4
18.3.1	Study Area	4
18.3.2	Relevant Guidelines, Policy and Legislation	4
18.3.3	Appraisal Method for the Assessment of Impacts	5
18.3.4	Data Collection and Collation	6
18.3.5	Waste Management Principles	8
18.4	Baseline Environment	9
18.4.1	Construction Waste	10
18.4.2	Municipal Waste	12
18.5	Potential Impacts	13
18.5.1	Characteristics of the Scheme	13
18.5.2	'Do Nothing' Scenario	13
18.5.3	Construction Phase	14
18.5.4	Operational Phase	18
18.6	Mitigation and Monitoring Measures	18
18.6.1	Construction Phase	18
18.6.2	Operational Phase	20
18.7	Residual Impacts	20
18.7.1	Construction Phase	20
18.7.2	Operational Phase	21
18.8	References	22
Chapter 19 (Material	Assets)	1
19.1	Introduction	1
19.2	Methodology	1
19.2.1	Study Area	2
19.2.2	Relevant Guidelines, Policy and Legislation	2
19.2.3	Data Collection and Collation	2
19.2.4	Appraisal Method for the Assessment of Impacts	3
19.3	Baseline Environment	5
19.3.1	Major Infrastructure and Existing Utilities	6
19.3.2	Imported Material	6
19.4	Potential Impacts	7
19.4.1	Characteristics of the Proposed Scheme	7
19.4.2	'Do Nothing' Scenario	7
19.4.3	Construction Phase	7
19.4.4	Operational Phase	12
19.5	Mitigation and Monitoring Measures	13
19.5.1	Construction Phase	13
19.5.2	Operational Phase	15



Section	Title	Page Number
19.6	Residual Impacts	15
19.6.1	Construction Phase	15
19.6.2	Operational Phase	15
19.7	References	16
Chapter 20 (Risk of Ma	ajor Accidents and / or Disasters)	
20.1	Introduction	1
20.2	Risk of Major Accidents and / or Disasters	1
20.2.1	Definitions	2
20.3	Methodology	3
20.3.1	Scope and Context	3
20.3.2	Legislation, Guidelines and Reference Material	3
20.3.3	Risk Assessment Methodology	4
20.4	Potential Impacts	7
20.4.1	'Do Nothing' Scenario	7
20.4.2	Risk Evaluation	7
20.4.3	Seveso Sites	12
20.5	Mitigation and Monitoring Measures	12
20.5.1	Inherent Design	12
20.5.2	Plans and Procedures	13
20.6	Residual Impacts	16
20.7	References	17
Chapter 21 (Cumulativ	ve Impacts & Environmental Interactions)	
21.1	Introduction	1
21.1.1	Cumulative Impacts	1
21.1.2	Environmental Interactions	1
21.1.3	Guidance	2
21.2	Methodology for Cumulative Impacts Assessment	2
21.2.1	Introduction	2
21.2.2	Stage 1: Establishing the Long List of 'Other Projects'	2
21.2.3	Stage 2: Establishing the Shortlist of 'Other Projects'	6
21.2.4	Stage 3: Information Gathering for the Shortlist of 'Other Projects'	7
21.2.5	Stage 4: Assessment	8
21.2.6	Traffic Related Cumulative Effects: Construction Scenarios for Assessment	8
21.2.7	Operational Scenario for Assessment	10
21.2.8	Summary of Assessment Methodology for CEA	10
21.3	Assessment of Cumulative Impacts and Environmental Interactions	11
21.3.1	Construction Impacts	11
21.3.2	Operational Impacts	35
21.4	Environmental Interactions	57
21.5	Mitigation	64
21.5.1	Construction Phase	64
21.5.2	Operational Phase	64
21.6	Summary of Residual Cumulative Impacts and Environmental Interactions	64
21.6.1	Construction Phase	64
21.6.2	Operational Phase	65
21.6.3	Environmental Interactions	65
21.7	References	66
	of Mitigation & Monitoring Measures)	1.
22.1	Introduction	1



Section	Title	Page Number
22.2	Mitigation and Monitoring Schedules	1
22.3	General Mitigation Requirements	2
22.4	Traffic and Transport	2
22.5	Air Quality	3
22.6	Climate	3
22.7	Noise and Vibration	4
22.8	Population	6
22.9	Human Health	6
22.1	Biodiversity	7
22.11	Water	17
22.12	Land, Soils, Geology and Hydrogeology	19
22.13	Archaeological and Cultural Heritage	21
22.14	Architectural Heritage	24
22.15	Landscape (Townscape) and Visual	30
22.16	Waste and Resources	32
22.17	Material Assets	34
22.18	Risk of Major Accidents and Disasters	35
22.19	Cumulative Impacts	35
22.20	References	36
Chapter 23 (Sur	nmary of Significant Residual Impacts)	·
23	Summary of Significant Residual Impacts	1