

Appendix A.

Photographs



Photo 1: East bridge from the west



Photo 2: Damaged gabion basket wall and man cleaning conch behind the fish fry on the north shore of New Providence between the two bridges to Arawak Cay.



Photo 3: Existing operations on Arawak Cay



Photo 4: Pocket beach north west of the west bridge between Arawak Cay and New Providence.



Photo 5: Area of button wood on the north east side of the west bridge between Arawak Cay and New Providence



Photo 6: Area between the two bridges between Arawak Cay and New Providence looking east from the west bridge



Photo 7: West bridge from the west and boats moored on the south side of Arawak Cay



Photo 8: Southern road on Arawak Cay



Photo 9: Queing transport at operations on Arawak Cay



Photo 10: Saunders Beach and west end of Arawak Cay and Silver Cay as seen from West Bay Street at Saunders Beach

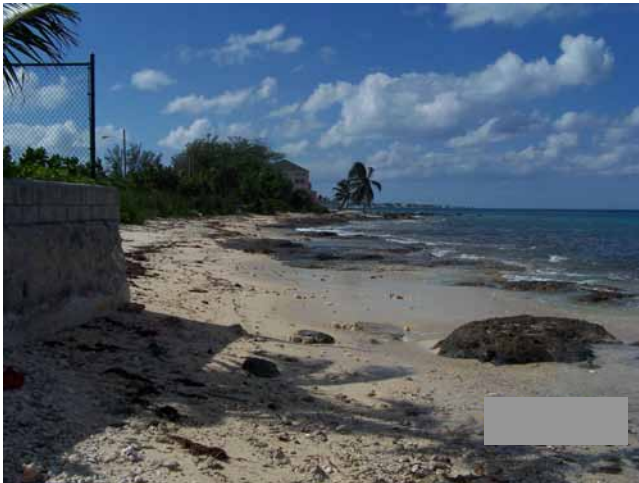


Photo 11: Existing beach east of Saunders Beach



Photo 12: Saunders Beach looking West

Appendix B.

WEEKLY TURBIDITY MONITORING REPORT

PROJECT: NASSAU HARBOR PORT IMPROVEMENT
 SAMPLING BY:

PRE-DETERMINED LIMIT OF TURBIDITY: **36 NTUs**

SAMPLE NUMBER	DATE	Time of sampling	DREDGE LOCATION (STATE PLANE or LAT/LON)		BACKGROUND STATION (STATE PLANE or LAT/LON)			Dist from dredge to background smpl (ft)	Pre-det limit or Bckgrd is greater	COMPLIANCE STATION NO. 1 (STATE PLANE or LAT/LON)			Dist: dredge or entrance to compl 1 smpl (ft)	COMPLIANCE 1 (Y/N)	COMPLIANCE STATION NO. 2 (STATE PLANE or LAT/LON)			Dist: dredge to compliance 2 smpl (ft)	COMPLIANCE 2 (Y/N)	Time of analysis	COMMENTS
			X/LON	Y/LAT	X/LON	Y/LAT	NTUs @ 3 ft			X/LON	Y/LAT	NTUs @ 3 ft			X/LON	Y/LAT	NTUs @ 3 ft				
1	1/5/2009	7:00					10.0	2000	36			39.0	1000	YES			30.0	3000	YES	8:00	
2	1/5/2009	13:00					10.0	3500	36	0	0	32.5	1000	YES			68.4	3000	NO	14:00	Shut down dredge due to non-compliant turbidity readings. Notified project manager. Resumed dredging when readings stabilized at < 29 NTUs above background.
3	1/5/2009	20:00					10.0	3100	36	0	0	30.0	1000	YES			31.5	2900	YES	21:00	
4	1/6/2009	7:00							36	0	0			YES					YES		Dredge shut down at 5 am
5	1/6/2009	13:00					10.0	2000	36	0	0	30.0	1000	YES			20.0	3000	YES	14:00	Dredging resumed at noon
6	1/6/2009	20:00					10.0	2000	36	0	0	31.7	1000	YES			38.4	2500	YES	21:00	

WEEKLY TURBIDITY MONITORING REPORT

PROJECT: NASSAU HARBOR PORT IMPROVEMENT
 SAMPLING BY:

PRE-DETERMINED LIMIT OF TURBIDITY: **36 NTUs**

SAMPLE NUMBER	DATE	Time of sampling	DISP LOCATION (STATE PLANE or LAT/LON)		BACKGROUND STATION (STATE PLANE or LAT/LON)			Dist from disp to background smpl (ft)	Pre-det limit or Bckgrd is greater	COMPLIANCE STATION NO. 3 (STATE PLANE or LAT/LON)			Dist: inlet to compl 1 smpl (ft)	COMPLIANCE 1 (Y/N)	COMPLIANCE STATION NO. 4 (STATE PLANE or LAT/LON)			Dist: disp to compliance 2 smpl (ft)	COMPLIANCE 2 (Y/N)	Time of analysis	COMMENTS
			X/LON	Y/LAT	X/LON	Y/LAT	NTUs @ 3 ft			X/LON	Y/LAT	NTUs @ 3 ft			X/LON	Y/LAT	NTUs @ 3 ft				
1	1/5/2009	7:00					10.0	2000	36			39.0	1000	YES			30.0	3000	YES	8:00	
2	1/5/2009	13:00					10.0	3500	36	0	0	32.5	1000	YES			68.4	3000	NO	14:00	Shut down dredge due to non-compliant turbidity readings. Notified project manager. Resumed dredging when readings stabilized at < 29 NTUs above background.
3	1/5/2009	20:00					10.0	3100	36	0	0	30.0	1000	YES			31.5	2900	YES	21:00	
4	1/6/2009	7:00							36	0	0			YES					YES		Dredge shut down at 5 am
5	1/6/2009	13:00					10.0	2000	36	0	0	30.0	1000	YES			20.0	3000	YES	14:00	Dredging resumed at noon
6	1/6/2009	20:00					10.0	2000	36	0	0	31.7	1000	YES			38.4	2500	YES	21:00	

WEEKLY TURBIDITY MONITORING REPORT

PROJECT: NASSAU HARBOR PORT IMPROVEMENT
STATEMENT OF AUTHENTICITY

Samples shall be taken using a 12 volt dc low velocity sampling pump. The pump shall be thoroughly flushed during each sample taken. Sample shall be placed in a clean collection bottle and placed in a closed container for transport to a controlled location. Each vial shall be clearly marked and labeled. Samples shall then be transferred into the appropriate vial specifically designed for use with the LaMotte 2020 turbidity meter. The samples shall then be analyzed with the LaMotte 2020 turbidity meter. A degree of accuracy will be less than $\pm 2\%$. Control depth for extraction of the samples of predetermined locations in the water column will be accomplished using a calibrated grade rod placed on the sea bed indicating water depth at that location as well as enabling control or adjustment of the collection orifice to the exact mid depth location.

I, _____ hereby state that the authenticity and limits of detection of the data sampling presented herein is true and accurate.

Date: 1/8/2009

Print Name

Signature

Notes: _____

Appendix C.

**Nassau Harbour Improvements Project
Contract Works Fortnightly Environmental Monitoring Form: ER GUIDELINES**

Works Site Name:

Contract Code:

Date:/...../ 20__

Materials Sourcing and Transport			
<u>Borrow Areas /Quarries</u>	Pass	Fail	Remarks
Acceptable site selection (previous or new)			<i>No attempt to open site in sensitive ecological area. Preference for use of previously opened sites; permits in place?</i>
Working plan (top soil /trees retained, ...)			<i>Is there an articulated plan for rational site(s) development taking into account need to conserve topsoil and trees wherever possible? Site should be demarcated by use of stakes and tape. Water sources sustainable?</i>
Restoration plan (agreed/implemented)			<i>Articulated plan for restoration to "as was" or alternative use where full agreement of land owner or local government authority; at completion, degree to which accomplished...?</i>
No undue clearance /drainage impact			<i>The site should be managed so that there is no impounding of water in the borrow area or sedimentation in local water bodies from erosion in the borrow area. ?silt traps needed.</i>
<u>Haulage</u>	Pass	Fail	Remarks
Access through ecol. sensitive areas agreed			<i>If through sensitive area, are there avoidable indirect impacts on flora and fauna or habitats</i>
No avoidable local nuisance (dust, traffic, etc)			<i>Is there proper consideration of local communities? Any justifiable complaints? Are tarpaulins being used?</i>

Work Site and Contractor Facilities			
<u>Location and Plant Operation</u>	Pass	Fail	Remarks
Acceptable siting (permits in place)			<i>Do work sites have requisite permit documents for land use or development, permanent or temporary (Lands and Survey or local government)...?</i>
Wetland (mangrove) preservation			<i>Is there due respect for preservation of mangroves?</i>
Sensitive operations in inter-tidal zone			<i>Is there any inappropriate and unsanctioned use of inter-tidal area for operations or dumping?</i>
<u>Fuel and Materials Storage</u>	Pass	Fail	Remarks
Protected and bunded hard standing			<i>Are fuel facilities located with reference to any possible fire or ecological hazard? Are they covered? Do they sit in bunded overspill area for capture of accidental spills?</i>

Note:

Pass column to be mark as either: 'n/i' (= non-issue), 'g' (= good), 'a' (= adequate) or 'p'* (= poor). Fail category to be marked as 'x'* only. * Where 'p' or 'x' entered a remark must be completed to describe nature of outstanding problem for follow-up. If significant problem(s) apparent supplementary note must be appended in box at foot of form.

**Nassau Harbour Improvements Project
Contract Works Fortnightly Environmental Monitoring Form: ER GUIDELINES**

Works Site Name:

Contract Code:

Date:/...../ 20__

Fire precautions in place (equipment, etc)			<i>Is there a written policy or Fire Plan? Are potential hazard areas marked, eg fuel sites? Is there fire equipment: buckets, extinguishers, blankets? Are they serviceable? Do site staff know how to use?</i>
Runoff collection drain /oil interceptor			<i>Is there plan for confining oils and site pollution in general, also directing runoff away from work/yard site. How are used oils being captured and stored for disposal?</i>
Acceptable temporary materials storage			<i>Are there hazards or nuisance to the general public from storage sites. Are better alternative solutions apparent?</i>
<u>Waste Collection/Disposal</u>	Pass	Fail	Remarks
No pollution risk to surface /groundwater			<i>No risk of runoff or leaching of chemicals on site into groundwater. No risk from pit storage of oils?</i>
Appropriate hazardous waste disposal			<i>Ask how oil or chemical waste is being disposed of? What is the plan? Is it legal?</i>
Adequate refuse/scrap disposal/clean-up			<i>Is waste being separated and kept in tidy areas for subsequent disposal? Is the site going to be cleared of metal, plastic and other waste in acceptable and legal manner? How will the site be cleaned up? Is it clean?</i>

<u>Occupational/Public Health and Safety</u>	Pass	Fail	Remarks
Tidy and safe working areas/facilities			<i>Tidy working is indicator of contractor seriousness in health and safety, also effective construction performance !</i>
Emergency and accident plan (Safety Officer)			<i>Ask who is designated Safety Officer on given/different site(s), establish at other visits if alternative person designated when offsite? Did he do a course? Does he know anything? Has he trained other staff? Ask what emergency number is to be used in case of accident. Have them prove it works. Is there an alternative plan. If just to ring contractor boss and he not available...</i>
First Aid kit available and complete			<i>Is First Aid Box available, adequate, and kept complete. Do staff all know where it is? Ensure not locked or easy possible access organised. Safety Officer should be responsible for accident log and Box.</i>
Protective helmets, boots, etc used			<i>What protective equipment is being used: boots, helmets, mufflers, eye protection,...? Is this appropriately used? Are accidents being recorded? Ask to see log book (it is specified in contract!).</i>

Note:

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**Nassau Harbour Improvements Project
Contract Works Fortnightly Environmental Monitoring Form: ER GUIDELINES**

Works Site Name:

Contract Code:

Date:/...../ 20__

Project Works, Structures			
<u>Docks/harbour constructions or repairs</u>	Pass	Fail	Remarks
Agreed Dredging Plan			<i>Is there an agreed method of working which is rational and being implemented? Is there due care in practice? Are silt screens being used properly, if specified?</i>
Minimum impact drilling and piling			<i>Is avoidable nuisance and disturbance being minimised to local communities and local marine environment?</i>
<u>Road Sections</u>	Pass	Fail	Remarks
Adequate roadside drainage			<i>Are drains effective and kept clear, ie not blocked with sediment, etc</i>
Swift re-vegetation of ditch /roadside slopes			<i>Have efforts been made to establish soil cover with local plant (grass) species, properly watered?</i>
Road (safety) signs in place			<i>Are temporary signs in place? Are permanent signs in place at post construction?</i>
<u>Habitat and Landscape Protection</u>	Pass	Fail	Remarks
Trees, valued landscape features retained			<i>Is there proper respect for integrity of local environment?</i>
No litter/rubbish, un-restored spoil tips			<i>Is there proper clean up, and avoidance of littering environment with debris?</i>

Version: Aug 15 2008

Detailing of problem areas where "poor Pass" or "Fail" recorded and any mitigation actions outstanding:

Elaboration is required here of outstanding difficulties to be overcome or specified mitigation measures from EMP to be executed... including what is expected in the immediate future by way of actions or performance improvement.

Form completed by: (ER)

Seen by: (Contractor's Agent)

This form is to be completed fortnightly and before signing off at Final Works.

Note:

Pass column to be marked as either: 'n/i' (= non-issue), 'g' (= good), 'a' (= adequate) or 'p'* (= poor). Fail category to be marked as 'x'* only. * Where 'p' or 'x' entered a remark must be completed to describe nature of outstanding problem for follow-up. If significant problem(s) apparent supplementary note must be appended in box at foot of form.

**Nassau Harbour Improvements Project
Contract Works Fortnightly Environmental Monitoring Form**

Works Site Name:

Contract Code:

Date:/...../ 20__

Materials Sourcing and Transport			
<u>Borrow Areas /Quarries</u>	Pass	Fail	Remarks
Acceptable site selection (previous or new)			
Working plan (top soil /trees retained, ...)			
Restoration plan (agreed/implemented)			
No undue clearance /drainage impact			
<u>Haulage</u>	Pass	Fail	Remarks
Access through ecol. sensitive areas agreed			
No avoidable local nuisance (dust, traffic, etc)			

Work Site and Contractor Facilities			
<u>Location and Plant Operation</u>	Pass	Fail	Remarks
Acceptable siting (permits in place)			
Wetland (mangrove) preservation			
Sensitive operations in inter-tidal zone			
<u>Fuel and Materials Storage</u>	Pass	Fail	Remarks
Protected and bunded hard standing			
Fire precautions in place (equipment, etc)			
Runoff collection drain /oil interceptor			
Acceptable temporary materials storage			
<u>Waste Collection/Disposal</u>	Pass	Fail	Remarks
No pollution risk to surface /groundwater			
Appropriate hazardous waste disposal			
Adequate refuse/scrap disposal/clean-up			

Version: Aug 15 2008

This form is to be completed fortnightly and before signing off at Final Works.

Sheet 15 of 2

Note:

Pass column to be mark as either: 'n/i' (= non-issue), 'g' (= good), 'a' (= adequate) or 'p'*(= poor). Fail category to be marked as 'x'* only. * Where 'p' or 'x' entered a remark must be completed to describe nature of outstanding problem for follow-up. If significant problem(s) apparent supplementary note must be appended in box at foot of form.

**Nassau Harbour Improvements Project
Contract Works Fortnightly Environmental Monitoring Form**

Works Site Name:

Contract Code:

Date:/...../ 20__

<u>Occupational/Public Health and Safety</u>	Pass	Fail	Remarks
Tidy and safe working areas/facilities			
Emergency and accident plan (Safety Officer)			
First Aid kit available and complete			
Protective helmets, boots, etc used			

Project Works, Structures			
<u>Docks/harbour constructions or repairs</u>	Pass	Fail	Remarks
Agreed Dredging Plan			
Minimum impact drilling and piling			
<u>Road Sections</u>	Pass	Fail	Remarks
Adequate roadside drainage			
Swift re-vegetation of ditch /roadside slopes			
Road (safety) signs in place			
<u>Habitat and Landscape Protection</u>	Pass	Fail	Remarks
Trees, valued landscape features retained			
No litter/rubbish, un-restored spoil tips			

Version: Aug 15 2001

Detailing of problem areas where "poor Pass" or "Fail" recorded and any mitigation actions outstanding:

Form completed by: (ER) Seen by: (Contractor's Agent)

Note:

Pass column to be mark as either: 'n/i' (= non-issue), 'g' (= good), 'a' (= adequate) or 'p'* (= poor). Fail category to be marked as 'x'* only. * Where 'p' or 'x' entered a remark must be completed to describe nature of outstanding problem for follow-up. If significant problem(s) apparent supplementary note must be appended in box at foot of form.

Appendix D.

Environmental Management Plan (EMP) Outline

The following provides an outline of the Environmental Management Plan (EMP) to be provided following the award of the contract.

1. PURPOSE SCOPE AND CONTENT
2. MANAGEMENT FRAMEWORK
 - i. Chain of Command
 - ii. Emergency Response
 - iii. Operation Procedure
 - iv. Communication Strategy
3. PROJECT PLANNING
 - 2.1 Preconstruction – Specific Topics
 - 2.2 Best Management Practices and Pollution Prevention
 - 2.3 Project Sequencing
4. PROJECT SAFETY PLANS
5. HARBOUR DREDGING AND MATERIAL TRANSPORT
 - 4.1 Dredging Operations and Methods
 - 4.1.1 Methodologies
 - 4.1.2 Vessels and Equipment
 - 4.1.3 Blasting Operations and Safety
 - 4.2 Material Transport Methods
 - 4.2.1 Piping and Pipe Corridor
 - 4.2.2 Barge Transport
 - 4.3 Limits of Dredge Area
 - 4.4 Dredge Material Containment Areas and Disposal of Return Water and Methods
 - 4.4.1 Methodologies
 - 4.4.2 Equipment and Materials
 - 4.4.3 Limits of Areas of Work
 - 4.4.4 Water and Stormwater Control Plan
 - 4.5 Land Reclamation
 - 4.5.1 Methodologies
 - 4.5.2 Vessels and Equipment
 - 4.5.3 Limits of Areas of Work
 - 4.5.4 Blasting Operations and Safety
6. PILING OPERATIONS
 - 6.1 Arawak Cay Extension
 - 6.1.1 Sheet Pile Installation Method Statement

6.1.2 Vessels and Equipment

6.1.2 Environmental Controls

6.2 Mooring Dolphin Installation

6.2.1 Method Statement

6.2.2 Vessels and Equipment

6.2.3 Environmental Controls

7. OPERATIONAL MANAGEMENT

7.1 Water Quality

7.2 Sediment Mobilisation from Dredge Head

7.3 Sediment Mobilisation from Spoil Disposal

7.4 Marine Flora and Fauna

7.5 Storage and Handling of Hazardous Substances

7.5.1 SPCC Plan

7.6 Waste Management

7.7 Noise and Hours of Operation

7.8 Air Quality

7.9 Protection of Sensitive Receptors

7.10 Environmental Emergency Procedures

7.11 Site Access

7.12 Site Clean-up

7.13 Management and Staff Responsibilities

7.14 Staff Training

8. ENVIRONMENTAL MONITORING

8.1 Monitoring Plan

8.2 Responsibility and Reporting Procedures

8.3 Co-ordination of Communication, Documentation and Record Keeping

8.4 Training and Certification

8.5 Water Quality Monitoring

8.5.1 Monitoring Schedule

8.5.2 Locations

8.5.3 Monitoring Methods

8.5.4 Duration

8.5.5 Maintenance of Control Measures

8.5.6 Reporting

8.6 Air Quality and Noise Monitoring