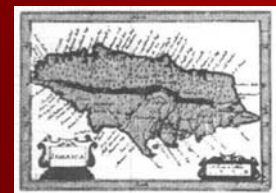


GUIDELINES FOR ARCHAEOLOGICAL IMPACT ASSESSMENT



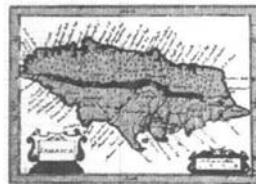
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GUIDELINES FOR ARCHAEOLOGICAL IMPACT ASSESSMENT

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1 Introduction

- 1.1 Archaeological Impact Assessment (AIA) applies to projects that will or potentially impact significantly on the material cultural environment; and which requires a systematic analysis of such effects before an informed and reasonable decision is taken to permit the project. Project proponents are required to provide information for the deciding authority to consider in the reviewing process. It gives other agencies with relevant environmental responsibilities and NGO's an opportunity to comment before an approval is granted. In addition, some information has to be made available for public scrutiny.
- 1.2 Although certain categories of information are needed for decision-making, each archaeological impact assessment study must be tailored to meet specific project characteristics and needs. Nonetheless, all Archaeological Impact Assessments must be preceded by an Archaeological Appraisal and a Desk-base Assessment; and must be governed by a Brief and Specification, except in special cases where the Archaeology Authority states in writing its irrelevance (See Appendices).
- 1.3 It is recognized that the extent of work, particularly in the preliminary stages of project planning, needs to be coordinated with the relevant Stakeholders). Therefore, representatives of the Archaeological Authority (the Archaeological Officer) shall meet directly with the stakeholders to provide project-specific clarification and interpretation of the guidelines where necessary. Depending upon the project and the nature of archaeological resources to be affected, flexibility can be expected in staging the impact assessment and the reporting requirements.

2 Archaeological Impact Assessment Procedure

- 2.1 The archaeological impact assessment procedure is composed of two principal components: **assessment** and **impact** management. Assessment is primarily concerned with the inventory and evaluation of archaeological resources, and the assessment of potential impacts of project. Impact management follows directly from assessment and is primarily concerned with managing unavoidable adverse impacts as well as unanticipated impacts. It is important to recognize that the assessment and impact management stages are approached sequentially in association with specific levels of project planning. The success of this process is dependent upon effective communication and cooperation between project proponents and the Authority, and their mutual respect for development and archaeological resource management objectives.

2.2 Impact assessment studies are only required where there are potential negative impact on the archaeological resources by the proposed development. These studies require an examination of the archaeological resource to be impacted, as well as the determination of the appropriate management strategies employed. . There are several methodological approaches that can be utilized in conducting an archaeological impact assessment. The archaeological consultant must produce a *Brief and Specification* to guide the research; which must be approved by the JNHT prior to implementation. Therefore it is strongly advised that consultants follow the Archaeological Authority's recommended impact assessment procedures: fashioned to facilitate the review process. The procedure should comprise:

- Consultation
- Site Appraisal
- Resource Identification
- Resource Significance Assessment
- Assessment of Impact
- Impact Management

2.3 Consultation

2.3.1 Consultation with the JNHT from the concept stage of development planning is strongly encouraged as this is recognized as best practice. Proponents should undertake consultation with the authority in developing their proposals prior to submitting it. Early consultation does not only provide information to inform the archaeological assessment process but offers an opportunity to the proponent from the outset to be cognizant of the archaeological situations need consideration and the level of input required. Undoubtedly, it is a most critical part of the information gathering phase of the project, but it is even more critical where proposal for activities are likely to have a significant potential impact on cultural materials of high importance.

2.3.2 Failure to have early consultation may result in loss of time and money due to changes to the nature or scope of the research and development projects. Lack of consultation often results in inadequate specifications which inevitably results in faulty research techniques and will result in a compromise of the integrity of the archaeological resources and the researcher. Faulty research information results in faulty decision making. . If impact assessments are not accurate or appropriate the Archaeological Authority will have no option but to deny development permission until it

is satisfied that an informed and reasonable assessment was done to facilitate reasonable informed decision.

2.3.3 The primary objective of the consultation is to achieve an appropriate impact assessment and environmental outcome. Consultation therefore is most effective when a mutually trusting relationship between developer and the Archaeological Authority is developed.

2.3.4 The values of consultation are:

- It may lead to the resolution or narrowing of issues prior to submission of a project proposal.
- It assists in the identification of the potential impacts and facilitates the preparation of the assessment,
- matters of cultural, spiritual or historical importance can be protected and measures put in place to avoid or mitigate any adverse effects,
- It can provide greater certainty in outcome,
- It can result in better outcomes and environmental protection,
- It saves time, cost and emotional anxiety.

2.4 Site Appraisal

2.4.1 An archaeological site appraisal is the profound first step necessary in the archaeological impact assessment review process and investigation.

(See Appendix B for details)

2.4.2 Archaeological Appraisal is intended to identify and assess archaeological resource potential or sensitivity within a proposed project area. Recommendations concerning the appropriate methodology and scope of work for subsequent impact assessment studies are also stated.

2.4.3 Appraisal should entail a rapid overview of the JNHT's Site and Monument Records and other readily available documentary evidence. These studies are of fundamental importance in assessing the archaeological resource potential of a study area, and should result in predictions regarding archaeological site variability, density and distribution. Overview of documentary evidence must be verified and supplemented by a preliminary field reconnaissance. However, depending on the availability and quality of existing data resulting from previous research of a site, it may be possible to achieve the appraisal research objectives without undertaking preliminary site visit. Consultation with resource person persons and organizations about the site is essential.

2.5 Resource Identification

2.5.1 When conducting archaeological impact assessment study, identification of cultural resources to be potentially affected by a proposed project is fundamental. Resource identification may be attained in two distinctive manners, (1) desk base research and; (2) Site Survey.

2.5.1.1 Desk-base Research

(a) This aspect of the study should involve a thorough review of library and archival literature as well as other relevant data sources including interviews. The research should include, but need not be limited to:

- extant records including the JNHT Site and Monument Record, land survey records, and other pertinent records and inventory files;
- all previous archaeological investigations in the study area or in the immediate vicinity;
- relevant information from published and unpublished sources such as local and regional history, prehistory and ethnography;
- a check of maps, plans and illustrations
- aerial photographs, satellite images to identify soil and crop marks

(See Appendix D).

(b) Individuals and organizations with knowledge of archaeological resources in the study area should be contacted and interviewed where appropriate. The objective is to compile information concerning the location, distribution and significance of archaeological resources. Interviews should be designed to elicit information which may facilitate reconstructing or confirming ethnographic and historic patterns of settlement and land-use. Among those who should be consulted are community elders, local museums, archaeological or historical societies, and specialists having local or regional knowledge of the area. Specialists may include archaeologists, historians and ethno-historians, among others. Interviews with various persons can provide the researcher with an opportunity to document public or community attitudes toward impacts which a proposed development may have on local archaeological resources. Consultants should conduct interviews only with the permission of their employer and must be handled very objectively.

2.5.1.2 Site Survey

- i Site Survey is similar to Field Evaluation in many respects but they are not the same. The latter is a more extensive and intensive process designed to retrieve data employed in establishing cultural significance. Site Survey constitutes a wide array of survey techniques, both intrusive and non-intrusive, use to identify archaeological resources. Best practice standards require that site surveys are used to confirm or refute the existence of archaeological sites reported or predicted from desk-based research. Survey should be undertaken in the event that historical, archaeological, ethnological, or other documentary sources necessary for identifying the archaeological resource potential of the study area are insufficient or unavailable. The techniques employed in site survey will vary depending on such factors as terrain, vegetation, land use, ease of access, urbanization, the size of the project area, and the types of archaeological resources being sought.
- ii Archaeological site surveys often involve both surface inspection and subsurface testing. A systematic surface inspection involves a traverse by foot along pre-defined linear transects which are spaced at systematic intervals across the surveyed area. This approach is designed to achieve representative areal coverage. An archaeological site survey may also involve a non-systematic or random walk across the surveyed area.
- iii Where archaeological sites are anticipated, it may be necessary to undertake some subsurface testing to locate sites lacking surface evidence, to delineate site boundaries, depth of the cultural matrix, and degree of internal stratification. Because subsurface testing, like any form of site excavation, is destructive it should be conducted only when necessary and in moderation. A subsurface testing is usually accomplished by excavating one meter square test units down to sterile stratum, although augers and core samplers are also used where conditions are suitable. Depending on the site survey strategy, subsurface testing is conducted systematically or randomly across the survey area. Other considerations such as test unit location, frequency, depth and interval spacing will also depend on the survey design as well as various biophysical factors. All test units placed on a site must be accurately recorded and mapped.
- iv Site survey may involve the complete or partial inspection of a proposed project area. Ideally, the archaeological site survey should be based on intensive survey of every portion of the impact area, as

maximum area coverage will provide the most comprehensive understanding of archaeological resource density and distribution. However, in many cases the size of the project area may render a complete survey impractical because of time and cost. In some situations it may be practical to intensively survey a sample of the entire project area. Sample selection is approached systematically, based on accepted statistical sampling procedures, or judgmentally, relying primarily on subjective criteria.

- v A systematic sample survey is used to locate a representative sample of archaeological resources within the project area. A statistically valid sample will allow predictions to be made regarding total resource density, distribution and variability. In systematic sample surveys it may be necessary to exempt certain areas from intensive inspection owing to inaccessibility as a result of rugged terrain, wetlands, landslides, land ownership, land use or other factors. These areas must be explicitly defined.

2.6 Resource Significance Assessment

- 2.6.1 Cultural resources identified on sites proposed for development ought to undergo assessment to determine their cultural significance. This activity is a crucial component to assessing proposed development impact on the cultural environment or setting. Cultural Significance is a conceptual conglomeration of several cultural values which includes aesthetic, scientific, public, ethnic, historic and economic values; all of which need to be taken into account when evaluating archaeological resources. For any site, explicit criteria are used to measure these values. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluatory criteria.

(See Appendix G)

2.7 Assessment of Impact

- 2.7.1. Impact on the archaeological resources may be perceived as the net change of a sites archaeological integrity that may be incurred by a proposed development project. This change may be either beneficial or adverse. Beneficial impacts occur wherever a proposed development actively protects, preserves, enhances and promotes or uses the archaeological resource in a sustainable manner. Though beneficial impact is not a common occurrence; it does occurs when archaeological resources are utilized in the promotion of heritage tourism.

2.7.2 The effects of development on archaeological sites are often adverse in nature. Adverse impacts occur under conditions that include:

- destruction or alteration of all or part of an archaeological site;
- isolation of a site or feature from its natural setting;
- adding elements to the archaeological asset that distort its authentic qualities and or context.

2.7.3 Adverse impact may be either direct and or indirect. Direct effects are the abrupt negative results of a project which can be attributed to a particular environmental modifying action. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The total destruction of Taino sites for the construction of highways or the relocation of graves to facilitate the erection of a hotels

2.7.4 Indirect impacts result from activities not directly associated with actual project actions but is attributed to modification to the environment. The effects are clearly induced by a project and would not occur without its actions; this includes housing development project, that may cause critical alteration to the landscape and natural drainage system so that heavy showers of rain result in severe flooding of an adjacent archaeological site or increased vandalism of archaeological sites, resulting from improved access to the area where it is located. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

2.7.5 Criteria used to Assess Impact

2.7.5.1 After project impacts are identified, it is necessary to determine their individual level-of-effect on archaeological resources. This assessment is aimed at establishing the degree to which the resources will be adversely affected by the proposed project. This may be achieved by establishing a number of criteria. Recommended criteria for assessing impact should include:

- Magnitude
- Severity
- Duration
- Range
- Frequency
- Diversity
- Cumulative Effect

- **Rate of Change**

- (a) *Magnitude*

The amount of physical alteration or destruction which can be expected to the archaeological site is called the magnitude. The resultant loss of archaeological value is measured either in amount or degree of disturbance.

- (b) *Severity*

Adverse impacts which result in an irretrievable loss of archaeological value are referred to as severity.

- (c) *Duration*

Duration is the length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on archaeological sites.

- (d) *Range*

The spatial distribution, whether widespread or site-specific, of an adverse impact is regarded as the range.

- (e) *Frequency*

Frequency speaks to the number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or ongoing nature.

- (f) *Diversity*

The number of different kinds of project-related actions expected to affect an archaeological site.

- (g) *Cumulative Effect*

This refers to the progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

(h) Rate of Change

Rate of Change is the rate at which an impact will effectively alter the integrity or physical condition of an archaeological site. Although an important criteria, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

2.8 Impact Management

2.8.1 The management of unavoidable and unanticipated adverse impacts on archaeological resources is achieved through the implementation of mitigation, watching brief, monitoring measures. These measures are only implemented in situations where unavoidable negative impacts are identified between archaeological resources and the proposed development.

2.8.2 Mitigation strategies

2.8.2.1 Mitigation strategies refer to measures taken to reduce negative effects of project construction, operation and maintenance on archaeological sites. Actions designed to prevent or avoid adverse impacts are also regarded as mitigation management. Mitigation recommended in an Archaeological Impact Assessment should be stated and discussed under this section with the aid of relevant maps, plans, illustrations and photographs. Mitigation measures may be outlined under the following headings:

- Project Relocation
- Design Changes
- Protection in Situ
- Data Recovery

(a) Project Relocation

- i Impacts can be avoided by relocating project facilities such as construction camps, storage facilities and re-aligning linear developments such as transmission lines, railways, drainage systems and roads. Suitable barriers such as fences should be erected where construction is in close proximity to significant archaeological sites. Avoidance is always the preferred mitigation measure as it ensures complete *in situ* protection of the resource for future investigation or use. Moreover, it is often the least costly measure to implement.

(b) Project Design Changes

- i An important means of mitigating adverse project impacts on archaeological sites is to instigate changes in the design. Alterations in project design are viable mitigation measures wherever adverse impacts on archaeological resources are unavoidable as it will prevent or reduced negative results.**
- ii Reducing the effects of project actions on archaeological sites can also be accomplished by decreasing the amount of development activities in some areas by using construction practices which minimize ground disturbance. Examples, restricting the use of heavy machinery and using project buildings that do not require subsurface foundations.**

(c) Site Protection

- i Archaeological preservation can also be achieved through measures that prevent or forestall site destruction. Site protection measures include protective covering, stabilization, and physical barriers.**
- ii Site capping or burial involves covering an archaeological site with fill, asphalt, concrete, or other materials. Once capped, project construction or other activities may be permitted to occur unimpeded over the site. However, site capping is an appropriate mitigation only when it can be demonstrated that important data will not be irrevocably lost through compaction, accelerated decomposition, or changes in soil chemistry. In addition, capping must take into account accessibility for future investigation and use.**
- iii Stabilization measures and the use of protective barriers may be appropriate in cases where archaeological sites are adjacent to the construction zone, and in areas where erosion or soil creep are anticipated. Under these conditions, the destruction or erosion of archaeological sites may be prevented by constructing barriers such as fences, dykes and gabions, or by utilizing landscaping practices such as differential clearing and slope terracing. Water channel diversion, designed to minimize erosion, may also be considered. In addition, a suitable buffer zone, within which no land alteration or other activity is permitted, is often necessary to ensure adequate**

site protection. Buffer width should depend on the proposed development activities and predictable future events.

- iv Site vandalism and the unauthorized digging and collection of artifacts are often indirect consequences of a development. Vandalism may be precipitated by the disclosure of site locations or by facilitating public access to otherwise inaccessible areas. Although site protection measures can play an important role in controlling vandalism, other approaches are usually required. Since site vandalism is primarily an educational problem, one approach is to conduct information programs for project personnel that promote archaeological conservation. In addition, the development of archaeological sites as special interest areas can also serve to deter vandalism, while allowing the resource to be of direct public benefit.

(d) Data Recovery

- i Recovery of data from archaeological sites represents a fourth, but less desirable, mitigation option. A principle disadvantage is that the recovery process itself is destructive; negating future opportunities for scientific research, preservation or public appreciation. Furthermore, even the most intensive and sophisticated recovery program is seldom able to retrieve all the data in an archaeological site; invariably a great deal of information will be lost. Proper data recovery and analysis is also very time consuming and expensive, and recovery costs are often difficult to estimate accurately. Therefore, systematic data recovery should be considered only as a last resort when project relocation, project design changes and site protection measures are unattainable.
- ii Where data recovery is the only viable mitigation option; it should be based on an adaptive, flexible research design and employ professionally accepted methods and techniques approved by the Archaeological Authority. Data recovery should aim to generate further scientific understanding and enhance public appreciation and awareness of the resource.
- iii The level or intensity of data recovery will depend on, site significance, size, time, site complexity, and the level of adverse effects. All recovered data must be analyzed, interpreted and reported. The materials and records must be available and accessible to future researchers.

3 Watching Brief

- 3.1 Watching Brief is undertaken in order to protect, retrieve and record archaeological resources during project construction and ensuring compliance with the Brief and Specification. The archaeological Officer and his/her team are required to be present on construction site to observe ground work in the event unpredictable archaeological assets are unearthed. Watching Brief is even more critical when archaeological remains are scheduled for destruction. 3.3.2 During watching brief, archaeologist has to work alongside heavy duty equipment thus making the process extremely dangerous at times. No JNHT or contracted personnel should be allowed to participate in watching briefs without proper safety gears and insurance.

4 Monitoring

- 4.1 Development that has adverse effects on archaeological assemblages and is subjected to mitigation measures must undergo monitoring. Monitoring is the surveillance of a development/archaeological project aimed at ensuring conformity with the brief and specification. It is also used to evaluate the progress and effectiveness of mitigation activities.
- 4.2 In the absence of a watching brief, monitoring may enable the Consultant Archaeologist or Archaeological Officer to detect unanticipated, unrecorded exposed cultural features and materials. Depending on the significance and nature of uncovered resources in such circumstances, an assessment and statement of significance may be necessary. As standard practice, monitoring results must be thoroughly documented in a monitor report and supplemented with maps, diagrams and photographs. This report, subject to review, should guide the next course of action.

5. Archaeological Impact Assessment Report

- 5.1 An Archaeological impact assessment report completed with stated specific study objectives, desk-base assessment research, field evaluation, significance assessment, assessment of impact, along with other appended information such as brief and specification, and site appraisal report, should be submitted to the JNHT as a fundamental part of the archaeological review process. The report should consist of the following components:

5.2 Cover Page

5.2.1 The cover page should include:

- The official project name and location;
- The type of archaeological resource assessment;
- The name and address of the agency for which the report was prepared;
- The report date;
- The author's signature and title.

5.3 Credit Sheet

5.3.1 The credit sheet should contain the names, addresses and professional affiliations of the principal contributors to the study including:

- The director or supervisor
- The researchers;
- The author.

5.4 Non-Technical Summary

5.4.1 The non-technical summary should outline in non-technical language a brief overview of the study. Important findings and major recommendations should be emphasized.

5.5 Table of Contents

5.5.1 The table of contents should be arranged in accordance with the sequence of topical headings and their corresponding page numbers.

5.6 List of Figures, Tables, Appendices

5.6.1 All figures, tables and appendices should be referenced by title and page number, and listed according to the order in which they appear in the text of the report.

5.7 Introduction

4.7.1 The introduction should include:

- i. the proponent's name and general nature of the project,
- ii. the objective and scope of the impact assessment,

- iii. the persons conducting the assessment and the kinds of professional expertise involved,
- iv. the dates and duration of the study,
- v. the organizational format of the report.
- vi. Legislative background

5.8 Proposed Project

5.8.1 This section should contain a brief summary of all pertinent development aspects of the proposed project (with the support of maps, plans, photos and other materials) outlining:

- i. project design planning and archaeological resource assessment to date,
- ii. any changes in the original project design or in the level of development,
- iii. precise boundaries of the project area including locations of all ancillary activities and facilities,
- iv. the projected extent and level of land alteration or disturbance, and
- v. project scheduling.

5.9 Project Area

5.9.1 This section should contain a brief description of the project area. Emphasis should be placed on relating the project area to the natural and cultural environments. The area of project impact may have been sufficiently described in the appraisal report, in which case a brief summary of and proper reference to the document will suffice. Description of the project area should include:

- i. biophysical features such a physiography, drainage, fauna, and flora,
- ii. a discussion of past and present ecological conditions that bear upon human settlement and land use,
- iii. past and present land use practices
- iv. the condition of the land, particularly the extent of alteration from agricultural activity, forest harvesting, or other intensive land uses,
- v. weather conditions and patterns, particularly as they relate to or affect the conservation status of the site, and the conduct and scheduling of fieldwork.

5.10 Methodology

5.10.1 The basic research plan and the precise methods and equipment used to implement the plan should be outlined in this section. Each assessment activity (desk-base assessment, site evaluation, significance assessment and impact identification and assessment) should be described individually.

5.10.2 Desk-Base Assessment

- A full description of the various methods and sources to be employed in obtaining historical, archaeological, geophysical, and other information about the site.
- rationale for each specific sources of information to be examined
- format used to present the information.

5.10.3 Site Evaluation

- the rationale underlying zoning of the project area according to the archaeological potential, and the level of survey intensity,
- the number of surveyors, the manner in which they were deployed over the survey area including distance intervals and direction of travel, and the amount of time spent surveying any one area,
- where and how subsurface testing will be employed, and the particular techniques or practices to be used including test frequency, interval spacing and unit dimensions,
- a thorough account of the sampling design, particularly sample selection and size,
- a comprehensive statement of the site recording processes,
- location of areas exempted from survey and rationale for exemption,
- the kinds of professional expertise involved and qualifications

5.10.4 Assessment of Significance

- a thorough description of the process that was used to derive a measure of relative site significance including the system of ranking or weighing various significance criteria.
- Outline the process used to discern the different levels of significance or priority criteria.

5.10.5 Impact Identification and Assessment

- How project impacts were identified
- Describe the process used to assess impact and the rationale for employing this strategy.

5.11 Desk-Base Assessment Results

5.11.1 This section should contain the results of documentary research and direct consultation outlined in a systematic manner according to date/period and type, indicating also their significance.

5.11.2 The results should include:

- i. A summary of previous archaeological works done on the site, reports and findings supported by maps showing their locations.
- ii. Summarizes relevant information from historical documents; illustrating necessary evidence.
- iii. Narrative description and sample of photographs, maps, plans, and other sources consulted.
- iv. Narrative and cartographic description of any newly discovered site or feature.
- v. Document information accrued from interviews.

(See Appendix D)

5.12 Site Evaluation Results

5.12.1 This section should contain results of the archaeological field evaluation and should include:

- i. maps showing areas surveyed, including the locations of survey transects and subsurface tests (test-pit excavation, borehole etc)
- ii. maps showing all recorded archaeological sites in relation to the proposed project,
- iii. the number of archaeological sites recorded and the total anticipated in the project area,

- iv. a brief narrative or tabular description of each site including present condition and use, distinguishing features, and its general relationship to the regional environment and cultural setting,
- v. a qualitative and quantitative summary of all cultural material or features observed or collected,
- vi. an interpretation of the archaeological resources including observed spatial patterning of sites in the project area, temporal, functional and contextual characteristics, and comparisons with other local or regional resources,
- vii. an explanation of negative results, such as where and why archaeological sites were absent in areas suspected of having moderate to high resource potential,
- viii. any further predictions concerning potential resource variability, density, distribution and importance in the project area.

5.13 Significance Assessment Results

5.13.1 The results of relative significance for each site should be presented here. The discussion should include:

- i. the process used to derive a measure of relative site significance including the system of ranking or weighting various significance criteria and the rationale underlying the process,
- ii. site-specific assessment result in tabular form,
- iii. a map and or table illustrating archaeological sites of high, medium, and low significance in relation to the proposed development.

5.14 Impact Identification and Assessment Results

5.14.1 This section should contain a thorough assessment of effects the development will have on the archaeological resources, positive and or negative, and a comprehensive statement of impacts. It should include:

- i. a map of the study area delineating areas of direct and indirect impact on the known and potential sites,
- ii. areas of uncertainty regarding the impact on the archaeological remains
- iii. impacts which have occurred to date from exploration, engineering and other feasibility studies,

- iv how project impacts were identified,
- vii. the process used to assess impacts on archaeological resources including assessment criteria.
- viii. the effects of project impacts on significance values,
- ix. impacts and the rate of resource depletion anticipated in the absence of the development.

5.15 Study Evaluation

5.15.1 This section should contain a critical evaluation of the impact assessment study. The discussion should address:

- i. the accuracy of predictions regarding archaeological resource density, distribution, variety and significance in the project area,
- ii the suitability of the field evaluation and survey techniques employed, and the level of confidence that can be placed on the survey results,
- iii. the suitability and reliability of the significance and impact assessment methods employed,
- iv the relationship between the results and the stated objectives of the assessment study
- x. the professional expertise involved in the project was adequate and appropriate
- xi. proposal of opportunities for any subsequent archaeological studies in the project area.

5.16 Impact Management/Mitigation Recommendations

5.16.1 The proponent/consultant recommendations for managing unavoidable adverse impacts on archaeological sites are presented here. Mitigation measures should be recommended for each affected site. Recommendations should be presented in sufficient detail to allow the Archaeology Authority to comment on their appropriateness. It should include:

- i. robust justification for relocating the proposed project to another site if the site is of national or international significance
- ii. a reference to those archaeological sites which can be avoided and preserved in situ by project design modifications,
- iii. a discussion of the process used to select a mitigation action from among various alternative for a specific site,

iv. recommended schedule for monitoring during project operation.

5.17 Appendices

5.17.1 A variety of items should be appended to the report including:

- i. a copy of the consultant's terms of reference for the impact assessment study,
- ii. appropriate tables, charts, graphs, maps, photos and other supportive materials,
- iii. a list of all recorded archaeological sites, referenced by their appropriate identification number and arranged according to either adverse impact or no adverse impact.

5.18 Figures and Plates

5.18.1 This section should contain carefully numbered figures showing location of known and potential archaeological resources within the affected development area. Figures should be easily reference to the national grid reference. Images of pre and post impact are also essential to the JNHT Sites and Monuments Record (*SMR*).

5.19 References Cited

5.19.1 A comprehensive list of all literary sources cited in the report such as publications, documents and records should be presented in this section. The reference list should also include names and dates of all personal communications.