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**Planning and
Production
of Environmentally
Sound Housing**

**Environmental Impact
Assessment
For
Housing Development Projects**

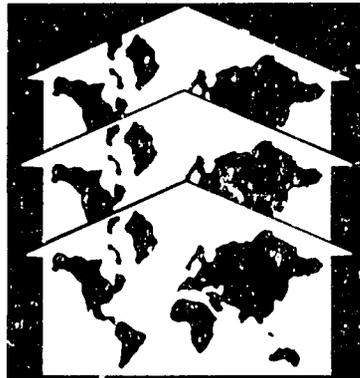
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**Planning and Production of
Environmentally Sound
Housing**

**Environmental Impact Assessment for
Housing Development Projects**

September, 1992

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For the:

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The views herein are those of the authors and do not necessarily reflect those of the Office of Housing and Urban Programs or the U.S. Agency for International Development.

TABLE OF CONTENTS

LIST OF ACRONYMS	iii
EXECUTIVE SUMMARY	1
1. INTRODUCTION	5
1.1 Background	5
1.2 Study Objectives	6
1.2 Study Methodology	6
1.3 Contents of the Report	7
2. OVERVIEW OF CURRENT APPLICATION REQUIREMENTS AND REVIEW PROCEDURES	9
2.1 General Background	9
2.2 Central and Local Government Requirements	9
2.3 INH Review Procedures	10
2.4 The Effectiveness of Current Review Procedures	14
2.5 Developer and Reviewer Responsibilities	17
3. SUMMARY COMPARISON OF PORTUGUESE AND U.S. PROCEDURES .	19
3.1 Summary of General U.S. Impact Assessment Methodology	19
3.2 Inappropriate Elements of U.S. Environmental Review Procedures	24
3.3 U.S. Procedures Relevant to Current Portuguese Needs	26

4.	RECOMMENDATIONS FOR REFINING ENVIRONMENTAL PLANNING AND ASSESSMENT PROCEDURES FOR HOUSING PROJECTS	29
4.1	Introduction	29
4.2	Conceptual Framework for Assessment	30
4.3	Study Requirements at Each Step in the Planning Process	34
5.	SUMMARY AND ACTION RECOMMENDATIONS	43
5.1	Summary of General Recommendations	43
5.2	Priority Action Recommendations	44

TECHNICAL ANNEXES

- A. Individuals and Sources Consulted
- B. Case Study Description
- C. California Environmental Quality Act Environmental Checklist Form
- D. Recommended Impact Checklist

LIST OF TABLES

1.	Elements Currently Required in Contents of Environmental Assessment of Social Projects in Portugal	12
2.	Steps in the California Environmental Review Process	20
3.	Conceptual Framework for Environmental of Social Housing Projects in Portugal	31
4.	Relationship of Environmental Factors to Major Housing Objectives	33
5.	Summary of Study Requirements at Each Step of the Planning Process	36

LIST OF FIGURES

1.	California Environmental Review Process Diagram	21
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LIST OF ACRONYMS

AIA	Avaliação do Impacte Ambiental (Environmental Impact Report)
AID	U.S. Agency for International Development (AID)
CCR	Comissão de Coordenação Regional (Regional Coordinating Commission of the Ministry of Planning and Land Management)
CCRLVT	Comissão de Coordenação Regional de Lisboa e Vale do Tejo (Coordinating Commission of the Lisbon and Tagus Valley Region)
CEDRU	Centro de Estudos e Desenvolvimento Regional e Urbano, Lda. (Center for Regional and Urban Studies)
CMVFX	Câmara Municipal de Vila Franca de Xira
CEQA	The California Environmental Quality Act
DGOT	Direcção Geral do Ordenamento do Território (Ministry of Planning and Land Management)
DGQA	Direcção Geral da Qualidade Ambiental (Ministry of the Environment)
DGRN	Direcção Geral dos Recursos Naturais (Ministry of Natural Resources)
EEC	European Economic Community
EIA	Estudo de Impacte Ambiental (Environmental Assessment or Initial Study)
EIR	Environmental Impact Report (California)
JAE	Junta Autónoma das Estradas (National Highways Department)
INH	Instituto Nacional de Habitação (National Institute of Housing)
LNEC	Laboratório Nacional de Engenharia Civil (National Civil Engineering Laboratory)
NEPA	National Environmental Policy Act (U.S.)
PDM	Plano Director Municipal (Municipal Development Plan)

PGU	Plano Geral de Urbanização (Local or Parish Development Plan)
PPU	Plano Pormenor de Urbanização (Detailed Development Plan)
RGEU	Regulamento Geral de Edificação Urbana (General Regulations for Urban Building)
RHO	Regional Housing Office/Lisbon, U.S. Agency for International Development
RTHS	Recomendações Técnicas para Habitação Social (National Technical Guidelines for Social Housing)

EXECUTIVE SUMMARY

Report Purpose. This report describes the findings and recommendations of a U.S. Agency for International Development technical assistance assignment to the Portuguese National Institute of Housing. The assignment called for an evaluation of the current procedures for evaluating the potential environmental impacts of social housing development projects.

The purpose of the report is to compare United States with Portuguese environmental assessment methodologies and recommend relevant aspects of U.S. procedures for use in refining the Portuguese approach to project review and approval.

The two-week field study involved examination of applicable procedures, discussions with INH staff, and interviews with representatives of local, regional and central governments. A proposed cooperative housing development project was selected as a case study and, together with the experience and observations of the prospective developer, Promocasa, and the planning staff of the affected municipality, Vila Franca de Xira, provided an invaluable focus.

The approach to environmental assessment recommended in this report was outlined at a seminar attended by a wide range of individuals involved in or concerned with social housing and environmental review. Seminar participants were given the opportunity to test the approach by applying it to the case study site and proposed project plan.

Recommendations. The report recommends the following general approach for achieving an overall improvement in the environmental quality of social housing projects. The recommendations are intended to guide refinement of the existing environmental review process in the most effective and least burdensome manner.

- Avoid after-the-fact assessments and reliance on environmental assessment professionals. Communicate the benefits of incorporating sensitivity to environmental principles from the start and establish procedures that encourage integration of environmental considerations into the planning process.
- Avoid preparation of EIRs for all but the largest or most complex projects or those that are not fully in compliance with municipal development plans and/or the plans for infrastructure, utility delivery and public services.
- Increase coordination among government agencies and encourage early review of development proposals to ensure appropriate site selection, avoidance of potential hazards and environmental impacts, and timely provision of adequate infrastructure and services.

- Encourage developers to use a systematic approach to incorporating environmental considerations in decisions at the key steps in the planning and development process, site selection, site assessment and site planning, so as to save time and money and improve project quality.
- Establish a conceptual framework for environmental assessment through the definition of the key objectives of a social housing development project: control of development and maintenance costs; provision of a safe environment; and creation of a place that is convenient, comfortable and identifiable.

Actions Needed to Achieve Recommendations. The report describes the following specific actions that should be taken in implementing process refinements.

- Add standards to Municipal General Plans (PDMs) specifically addressing the urban environment, including park standards, dedication requirements, where applicable, and environmental impact "thresholds" for identifying unacceptable cumulative project impacts on urban systems.
- Require local plans (PGUs) to fully address connections with adjacent developments, appropriate land use relationships and integration into the overall community.
- Establish checklists to be completed at the three key steps in project development: site selection; site assessment; and site design. Establish a procedure for municipality review of checklists.
- Ensure that municipal planning staff are available to advise prospective developers during site selection, site assessment, and site planning and development.
- Set up a "clearing house" system for eliciting review of proposed projects by all affected agencies.
- Prepare a handbook for wide dissemination among developers and municipal planners. Illustrated with examples and graphics, the handbook would describe the broad array of general information required at the site selection or screening step, the more detailed information and analysis required at the site assessment step, and how to work with cost, safety and amenity constraints in the site planning and design step to achieve project objectives.

Why the Actions are Needed. Traditionally, concern with environmental issues has tended to be limited to water quality, air quality, noise and solid and toxic waste. Recent local and

regional planning efforts have been expanding the topics of concern, although their emphasis has, of necessity, been upon creating the basic framework for regional and community patterns of development.

Examination of the case study PDM, for the Municipality of Vila Franca de Xira, indicates that a good job has been done of identifying the most significant development constraints. However, in future, the Municipality will need to assemble and analyze more detailed constraint data to guide preparation of local and site plans. At the same time, the INH in its guidelines for developers has stressed approaches to improving the quality of the housing unit. Thus, it has given limited attention to matters relating to the residential environment. Those matters include site selection, building location and orientation, creation of usable and maintainable open space, prevention of downstream impacts, and integration with off-site development.

The Potential Adverse Consequences of Poor Environmental Planning. Examination of the case study project, together with several completed cooperative and private developments in the municipality, revealed numerous areas of concern. Additional attention to and understanding of environmental conditions and processes could have improved the level of amenity, the potential safety, and the long-term cost-effectiveness of these developments. For example, some residential developments have been built on steep slopes and other difficult sites without the benefit of topographic, geologic or hydrologic studies. As a result, residents and structures may be vulnerable to hazardous conditions, such as landslides, seismic ground shaking, and floods, with potentially catastrophic consequences.

Overall development costs may be increased by inappropriate siting or site-planning decisions. For example, construction on hard rock may involve high excavation costs, while construction on expansive soils may require special foundations or result in long-term repair costs. Maintenance costs may also be increased by building orientation that creates unprotected open spaces. Insufficient attention to a site's environmental factors can also result in developments that lack many of the attributes that contribute to pride of ownership, such as privacy, convenience, and identity. Poor coordination of projects with adjacent development is also common and further diminishes the sense of place and community.

Finally, current assessment procedures clearly demand insufficient interagency and interdisciplinary coordination. The lack of coordination can have significant effects on both the urban and the natural environment. For example, residential developments may be constructed in advance of the necessary infrastructure, such as sanitary sewage treatment plants and storm drainage systems. Other developments, whose siting and site planning have been based on insufficient understanding of environmental conditions and relationships, may destroy or degrade valuable habitat.

The effects of an unwisely-planned development on the urban and natural environment may not be immediately apparent. The cumulative effects of additional developments can build up to create severe safety hazards, unmanageable service and infrastructure costs, and degradation of living standards. Moreover, inadequate infrastructure and habitat loss in upstream areas can have far-reaching cumulative effects on riverine and coastal waters and valued areas, such as the National Ecological Reserve, where environmental quality is more visible and measurable.

1. INTRODUCTION

A previous study, The Environmental Consequences of Urban Growth in Portugal, December 1991, examined environmental effects of urban development at the regional level, taking the Setúbal peninsula as the focus of study. That study identified the urgent need to recognize common environmental values and planning objectives to guide the decisions of regional and municipal governments regarding a number of major projects in various stages of development, planning or discussion. Particular emphasis was placed on the need for improved vertical and horizontal coordination among all agencies of government, both general and sectoral, so that valuable resources could be protected through a common understanding of their value.

The current study addresses a similar theme at a more detailed scale, bringing the focus of attention down to the local level -- looking at the environmental effects of individual residential developments. Specifically, Instituto Nacional de Habitação (INH) expressed an interest in exploring, with its partners the municipalities, housing cooperatives and private developers, how to ensure a high quality environment in each social housing project. This technical assistance mission is designed to allow Portuguese organizations and professionals to benefit from experience in the United States.

1.1 Background

Since 1984, the INH has financed the construction of more than 35,000 dwelling units with sales prices averaging less than the median market price. In so doing, the INH has used special credit programs to stimulate production of low-cost housing by private entrepreneurs, cooperatives and municipal authorities.

Though the INH has applied environmental impact criteria to its project approval process since its inception, primarily through application of the National Technical Guidelines for Low-Cost Housing (Recomendações Técnicas para Habitação Social or RTHS), new legislation relating to the environment and land development has broadened the application of stricter criteria and strengthened requirements for environmental impact assessments at all stages in the land development process. Private and public sector organizations at national, regional and local levels are presently defining the most appropriate methodology for adequate environmental impact analysis in future.

1.2 Study Objectives

The purpose of this program is to provide assistance to the INH, local governments and private residential developers on the planning and production of environmentally sound housing. Specific objectives were stated as follows:

- to analyze the methodology being applied to establish the sharing of responsibility between the INH, regional and local governmental agencies, private sector land developers and identify options that seem most appropriate for Portugal;
- to apply, in a case study situation, a process of environmental impact assessment to site selection, site assessment and planning and design as appropriate, the "due diligence" study process commonly used in the USA;
- to provide reflections and commentary on achievement of the above listed objectives in a workshop for private and public sector professionals; and
- to outline an approach in this report to assist local governments and developers with more effectively implementing environmental procedures.

1.3 Study Methodology

In response to the request by the INH, the Agency for International Development's Regional Office of Housing contracted the services of a consultant to perform a three-week study. The work involved a thorough review of the procedures used by INH for project analysis and approval and a review of current housing project development methodology as applied by land developers, municipal governments and federal planning agencies in Portugal. This allowed review requirements to be matched to procedures, with special reference to a case study project and supported formulation of a recommended methodology.

The project selected as a case study consisted of 633 housing units to be developed by Promocasa, an association of four housing cooperatives. The 14.7-hectare site, Quinta da Maranhota, is at Vialonga in the Municipality of Vila Franca de Xira, approximately 50 kilometers north of Lisbon in the Tagus valley. The proposed development, shown in Annex Figure B-1 and Annex Table B-2, achieved an average density of approximately 46 units per hectare in a combination of 10-story towers, four-story linear buildings, and single-family houses.

The overview of the status of environmental assessment and recommended procedures represent the consultant's perspective, based on observations, discussions with those involved in project

planning and review, as well as many years of experience in the field in California. Technical support was provided by the staff of the INH and the Municipality of Vila Franca de Xira. The recommended new methodology is presented in this report in terms of what has to be done to carry it out and according to what standards and objectives.

The purpose of the workshop would be to provide guidance to private residential developers regarding how to comply with the municipality's policies, standards and other expectations for environmentally sound housing. The workshop would take the participants through the questions to be asked in planning and producing an environmentally sound housing project; the information required; where or how to obtain the information; and how to use the information.

While a single municipality was used as a case study, the guidance is intended to be generic and suitable for subsequent refinement and incorporation into additional guidance for private developers. The intent would be to reduce project processing time and improve project quality, with benefits to developers in terms of reduced costs and perhaps increased salability as well as benefits to understaffed municipalities through cooperative planning.

1.4 Contents of the Report

Chapter 2 summarizes the current environmental requirements that must be met by a proposed social housing project application and outlines the existing application review procedures. The chapter concludes with a brief assessment of the effectiveness of the requirements and the procedures. Chapter 3 compares U.S. and Portuguese environmental impact assessment methodology. The discussion distinguishes those aspects of U.S. procedures that are relevant to Portugal's needs from those that have proved to be ineffective. Recommendations for a refined set of standards and procedures are presented in Chapter 4, while the final chapter reiterates those action recommendations that deserve the highest priority as refined procedures are put in place.

2. OVERVIEW OF CURRENT APPLICATION REQUIREMENTS AND REVIEW PROCEDURES

This chapter presents a brief overview of current procedures and assesses their effectiveness to provide the context for the report's recommendations.

2.1 General Background

Formal environmental assessment of projects in Portugal is still restricted to major projects such as industrial and infrastructure developments, as mandated first by EEC Directive, June 1985, and since June 1990 by the National Environmental Impact Assessment (AIA) law (186/90). Smaller projects that fall outside the purview of the AIA law, including the great majority of residential projects, have received a less extensive environmental review conducted by national or local government agencies as part of the basic project review and approval process. In addition, those social housing projects whose developers seek INH financing assistance must also undergo review by INH.

2.2 Central and Local Government Requirements

DGOT Responsibilities. Discussion of the project review and approval process has to be placed in the context of the evolving requirements and implementation of planning law in Portugal. Responsibility for review and approval of detailed plans for most developments and subdivisions currently rests with the central government, Direcção Geral do Ordenamento do Território (DGOT) until local general plans have been adopted. The process of preparing those plans (Planos Directores Municipais or PDMs) began in 1982 but proceeded slowly until stimulated by a new law in 1990 (Decreto-Lei No. 69/90). This law was enacted as part of a simultaneous effort to prepare broad regional plans and effective municipal plans. While only six PDMs have been ratified by the central government, remaining municipalities have begun the process and many have completed their plans.

Until March 29, 1992, local governments had the authority, even prior to PDM ratification, to approve development projects in subdivisions with approved local plans (Planos Gerais de Urbanização or PGUs). Larger subdivisions lacking some elements of infrastructure required regional (CCR) approval, while very large or complex subdivisions required central (DGOT) approval.

Following ratification of all the PDMs, the central government will only be involved in local project review in the case of conflicts with the PDM (i.e. developments requiring subdivisions that are not in conformance with the PDM) or appeals against local decisions. It will then be possible for DGOT to return to matters of national planning and policy. Municipalities, on the other hand, will be able to approve all subdivisions within the approved PDM limit, or perimeter, of urban growth. With that authority will come the responsibility for ensuring compliance with the terms of the PDM, availability of infrastructure, and adherence to other, as yet undefined, standards and policies for achieving a quality urban environment.

Municipality Responsibilities and PDM Content. For approval by a municipality at present, a proposed project must lie within the urban perimeter and comply with the designated use or uses shown on the Land Use Map of the PDM. Compliance is also required with the applicable local PGU, and, if applicable, an approved detailed plan (Plano Pormenor de Urbanização or PPU).

Planning law requires the PDM Land Use Map to be based on a synthesis of exclusion factors shown in Table 1 on page 12. Compliance with the PDM therefore assures avoidance of areas clearly unsuitable for development. In addition, data on other environmental factors must be collected, analyzed and mapped so that the criteria listed in Table 1 (A -- Minimum Municipality Requirements) can be applied in the preparation and implementation of the PDM Land Use Map. Thus, in reviewing a proposed project, the municipality will need to scrutinize it for its attention to those criteria. (It should be noted that all comments on PDM legal requirements and their implementation are based on examination of the PDM for the Municipality of Vila Franca de Xira.)

2.3 INH Review Procedures

Regulatory Framework. The INH review procedures primarily address the dimensions and functional organization of a project, and the proposed construction method and materials, with particular attention to the final cost of the housing units. The basic regulatory framework for the review is established in two documents, the General Regulations for Urban Building (Regulamento Geral de Edificação Urbana or RGEU) and the National Technical Guidelines for Social Housing (RTHS), and a decree (Portaria 28/88) defining maximum gross square footage that can be considered in order to achieve social housing cost objectives.

Each of the elements of the regulatory framework deals principally with the buildings and the housing units, with little attention to issues involving the residential environment, including site selection, building location and orientation, integration with off-site areas, and the creation of usable and maintainable open space. For example, only approximately four out of 90+ pages of

the RTHS are devoted to site planning and design matters.

Application Review Procedure. At a minimum, INH requires a proposed project to have received approval by the affected municipality before it will consider an application for financing assistance. When local approval has been received, INH performs a preliminary analysis that examines: location, ownership, project size and phasing; site topography and geology; the relationship of buildings to the site's terrain, project links with the surrounding and evolving urban area; conformance with approved urban plans; the balance among numbers of units of each type proposed; unit dimensions and floor plans; construction type and conformance with RTHS requirements for such items as solar orientation; and overall level of quality. The information required for the preliminary analysis is summarized in Table 1 (B).

The preliminary review begins after the site has been selected and the site, grading and floor plans have been prepared. The second and final review, which addresses the final plans and architecture, checks conformance with the preliminary analysis, previously approved final design details, and required application content. The timing and content of the analyses shown in Table 1 indicate that, at present, INH pays relatively limited attention to elements of the physical and biological environment and a proposed project's relationship to them. Examination of the analyses of two recent projects, near Sintra and at Covilhã, confirmed this observation. INH must therefore place great reliance on the review conducted by DGOT or the municipality as the responsible planning agency.

In one respect, the INH requirements exceed those of the municipalities. They require submission of a special geological and geotechnical report in all cases. Most PDMs only require such additional studies in specified areas. Thus INH recognizes the limitations of relying on information at the scale of a PDM (usually 1:25,000) for purposes of the Preliminary Analysis.

In addition, a set of site planning guidelines has been drafted that greatly expands the site planning section of the RTHS (Draft Revision of Part 3 of the National Technical Guidelines for Social Housing, prepared by LNEC, 1988). The revised recommendations are well drafted and relatively complete with respect to many aspects of site planning. However, they do not address critical elements of the natural and man-made environment that should be taken into account in choosing and planning a site. Moreover, these revised guidelines have not been officially adopted. At present, therefore, INH can only use them in an advisory manner when reviewing projects.

TABLE 1. ELEMENTS CURRENTLY REQUIRED IN ENVIRONMENTAL REVIEW OF SOCIAL HOUSING PROJECTS IN PORTUGAL

A. Minimum Municipality Requirements:

1. Compliance with the Plano Director Municipal (PDM)
2. Compliance with detailed plans (e.g. PPU or PGU)
3. Attention to legal constraints shown on technical data maps:
 - **Geotechnical:**
 - Avoidance of slopes over 30 percent
 - Especial care with slopes over 15 percent
 - Avoidance of land with high erosion hazard
 - Areas of instability requiring geologic and geotechnical studies
 - **Drainage:**
 - Detailed requirements for stream and river buffers:
 - 50m from the margins of navigable or tidal waterways under port or maritime jurisdiction
 - 10m from tidal but non-navigable waterways (measured from the edge of the bed under conditions of medium flow)
 - 30m along other navigable or tidal waterways under port or maritime jurisdiction (measured under average flow conditions)
 - a minimum non-buildable band of 5m along non-tidal, non-navigable waterways 10m wide or larger, subject to approval by DGRN
 - Detailed requirements for the avoidance of flood plains
 - **Ecologically Sensitive Areas:**
 - National Ecological Reserve (REN)
 - Areas related to the REN designated by the following conditions:
 - water courses
 - flood plains
 - headwaters of streams
 - slopes over 30%
 - areas of maximum infiltration
 - National Agricultural Reserve (RAN) (1)
 - **Biological Resources:**
 - Avoidance of high fire hazard areas
 - **Protection of Cultural Heritage:**
 - Buildings and artifacts (listed)
 - Archaeological resources (listed)
 - **Infrastructure.**
 - Avoidance of building over and within buffers of:
 - sewers and water lines
 - electrical lines
 - geodesic markers

- school buildings
 - reservoirs
 - parks and reserves
 - major highways and roads
 - railways
 - airports
 - government installations
 - rock quarries
- Land Use
 - No building beyond the urban limit line (perimeter)
 - No subdivision (creation of lots) in specified areas
 - Restrictions on density, height and bulk, plus parking minimum requirements by type of residential land use in urban areas
 - Additional regulations for areas designated for other types of land use

B. INH Minimum Requirements:

1. Approval by Municipality
2. Preliminary Analysis based on Application Contents
 - A written description of the project;
 - Construction specifications; and
 - Mapped and graphic exhibits, including:
 - location plan to allow evaluation of the projects integration with the surrounding areas and links with existing infrastructure (minimum scale 1:2,000)
 - Infrastructure needed to serve the development (minimum scale 1:500)
 - Site topography (minimum scale 1:500)
 - Site and grading plan (minimum scale 1:500)
 - Floor plans, including typical furniture arrangement, sections, elevations, and detailed sewer and water line plans.
3. Geological and geotechnical study (for all sites)
4. Formal review of compliance with National Technical Guidelines for Social Housing Projects, INH, 1985 (Revised 1988)
5. Informal review in the context of unofficial site planning guidelines (Revision of Chapter 3, National Technical Guidelines for Social Housing Projects, Laboratório Nacional de Engenharia Civil (LNEC), 1988)
6. Final Analysis
 - Check on adherence to Preliminary Application requirements
 - Architectural Details
 - Construction Specifications

Source: CM Vila Franca de Xira: Plano Director Municipal (PDM)

Note 1: Specific to CM Vila Franca de Xira

2.4 The Effectiveness of Current Review Procedures

To date, the emphasis of local and regional planning efforts has, necessarily, been upon creating the basic framework for regional and community patterns of development. A review of the case study PDM indicates that a good job has been done in identifying the most significant development constraints. In general, however, more detailed constraint data need to be assembled and analyzed to guide preparation of local and site plans. At the same time, the INH guidelines for developers have stressed approaches to improving the quality of the housing unit. More limited attention has been given to issues involving the residential environment, including site selection, building location and orientation, integration with off-site areas, and the creation of usable and maintainable open space.

Examination of the case study project in the Municipality of Vila Franca de Xira, together with several completed cooperative and private developments in the municipality, confirmed these observations. Additional attention to and understanding of environmental conditions and processes could have improved the level of amenity, potential safety, and long-term cost-effectiveness of these developments.

The following discussion highlights some of the areas of concern revealed or confirmed by the examination of the case study project and other projects, project assessments, and developments.

Topography. Site plans often appear to pay little attention to the site's topography and the influence of slope and aspect on safe construction, control of runoff, construction cost, orientation to views and protection from wind. For example, the case study site plan places the 10-story towers on the steepest part of the site where slopes exceed 15% (see Annex Figure A-2), suggesting that a thorough slope analysis was not performed as part of the site assessment. The INH technical (RTHS) requirements for passive solar access were met. However, the site plan suggested that little attention had been paid to orientation and organization of structures to maximize views and to avoid blocking views from other units. Moreover, no concern appeared to have been given to protection from the winds funneled northwards along the Tagus valley.

Geology. The review of completed projects and the Quinta da Maranhota case study suggests that, at least until recently, potential geologic constraints have not always been adequately considered. The geological complexity of the Quinta da Maranhota case study site demonstrates the wisdom of the INH in requiring a geologic study in all cases. It shows that understanding geologic and geotechnical conditions is often critical to preparing an appropriate site plan, even though it lies outside of a zone where the PDM requires such a study.

Parts of the site are made up of Cretaceous rocks which offer good building sites. Elsewhere there are areas of softer clays, marls and conglomerates of unknown depth and bearing capacity.

Yet another part of the site contains a section of a volcanic dyke where extremely hard rock could require blasting, with potentially infeasible development costs. Finally, the PDM geologic map shows a fault running the length of the site near the southern edge of the site as well as several hidden (subsurface) faults in the northwestern corner. The presence of a fault does not necessarily imply that the site might be subject to seismic hazards. However, this is another reason for performing an early geologic and geotechnical study.

Soils. Greater attention is also needed to select sites and design site plans that avoid soils unsuitable for development, including productive agricultural soils, soils important for groundwater recharge, and soils susceptible to landslides. Significant damage has occurred in parts of the Municipality of Vila Franca de Xira as a result of landslides. Care is also needed to avoid or plan for expansive soils and erodible soils. Expansive soils can add significantly to project cost, whether through initial treatment and foundation costs or subsequent repair costs. Building on soils with high erosion potential can adversely impact nearby and downstream drainage courses. At the case study site, rapid sedimentation could reduce stream capacity to handle runoff, and a high sediment load could reduce the quality of water in streams and the estuary, affecting important habitats, such as the National Ecological Reserve (REN).

Drainage. PDM requirements include avoidance of areas of stream formation and buffer zones of specified widths appropriate to various types of streams. However, field observations in the Municipality of Vila Franca de Xira revealed instances of development encroaching on and even eliminating stream buffer areas. In one instance, evidence of active erosion of valley walls on either side of a site suggested the advisability of a buffer wider than the PDM minimum requirement so as to protect development from being undercut.

Observations also revealed lack of provision for storm drainage, limited attention to controlling the volume and velocity of runoff, and potentially hazardous contributions to downstream flood conditions. For example, as development has increased in recent years in the hills that define the Tagus Valley in the Municipality of Vila Franca de Xira, several areas at the foot of the hills have experienced severe floods, with considerable loss of life and property.

Vegetation. A requirement to address vegetation in PDMs was added only recently. To date, only areas of vegetation posing a high wildfire hazard need to be identified. Field observations on the case study site revealed the potential presence of rare plants and habitats which could have important connections with the National Ecological Reserve. However, there is currently no legal requirement to investigate their presence.

Surrounding Land Uses. Many recent housing projects, private as well as social, reveal little, if any, recognition of the desirability of integrating new developments with adjacent land uses. Connection with surrounding neighborhoods and land uses is a significant concern of reviewers

at INH. INH requires submission of a location plan (minimum scale 1:2,000) to allow evaluation of the project's integration with the surrounding areas and links with existing infrastructure. However, it is rarely possible to achieve a significant reorientation and greater cohesion after a project plan has been prepared. As a result, adjacent developments may lack pedestrian or vehicular links. Access to work, schools and shops may be inconvenient, and tall buildings may overshadow single-family homes. In these circumstances, it is hard to develop either a visual or a social sense of community in newly developing areas. In or adjacent to older towns, poorly integrated developments diminish the traditional consistency of form and architecture that gives those communities their character.

Infrastructure. Current assessment procedures appear to involve insufficient interagency coordination. Among the possible results are construction in advance of necessary infrastructure, such as sanitary sewage treatment plants and storm drainage systems, or the assurance of an adequate and cost-effective water supply. The consequences could include costly project delays, health impacts, and cumulative effects on the environmental quality of riverine and coastal waters and valued areas such as the National Ecological Reserve. Many of those interviewed for this study expressed concerns about the difficulty of coordinating development and capital improvement funding with the National Highways Department (JAE). As a consequence, for example, many developments in the Municipality of Vila Franca de Xira are affected by substandard highway underpasses.

Services, Amenities and Open Space. In a number of existing developments visited for this study, open spaces are windswept or overshadowed by tall buildings. As a result, they are both uninviting and hard to maintain. The unfinished edges of excavations and other abrupt changes of grade reduce mobility around the developments and make access to shops, laundry and other services inconvenient for some residents. Such developments lack attributes that contribute to pride of ownership, such as privacy, climate protection, convenience, and identity. Poor coordination of projects with adjacent development further diminishes the sense of place and community.

A few new communities suggest careful attention to topography and orientation. They offer models of how to provide private open space along with smaller areas of usable and maintainable public space, and how to handle steep slopes, curving topography and off-site connections with grace and ease.

The prospective developer of the case study cooperative housing project voiced a concern about the lack of established urban environmental standards (Carlos Silva, Promocasa). Municipalities and PDMs have not yet addressed issues such as appropriate school service area dimensions, retail square footage requirements for developments of various sizes, park acreage standards, or means of acquiring open space, such as dedication requirements or assessment districts. Because

of this lack of guidance, many developers feel isolated and restricted in their ability to prepare adequate plans.

An additional concern has to do with how to ensure the availability of needed services in very large, phased developments. Since INH now discourages very large projects, responsibility for addressing this issue will shift to the municipalities as part of the process of refining and implementing PDMs and PGUs. Cooperative developers would also like assistance with phasing and site planning to avoid conflicts between incompatible types of development, such as kindergartens and housing units for the elderly.

2.5 Developer and Reviewer Responsibilities in Project Planning

In the future, INH will continue to make an environmental review but, before it approves a project for financial assistance, it will need to know that the municipality has made its own review and given approval. At the same time, as the remaining PDMs are adopted and others are revised, each municipality will have more opportunity to focus on setting standards for new development. Those standards should help to realize the social, economic and environmental objectives of the PDMs. Thus, increasingly, municipalities will take on a partnership role with both DGOT and INH which, in turn, will rely on them to assure environmentally sound projects.

INH is also seeking to strengthen the existing partnership by establishing standards for the development of new communities. While the additional standards for site design recommended by LNEC do not yet have the force of law, they may do so in the future. It will therefore be desirable for prospective developers and municipality reviewers to anticipate some of the refinements that INH may require in future.

For developers of housing, there will be significant benefits to understanding what both the municipalities and the INH require of them now and are likely to require in the future. Speedier review and approval will result in cost savings for both the developer and future residents.

3. SUMMARY COMPARISON OF PORTUGUESE AND U.S. PROCEDURES

3.1 Summary of General U.S. Impact Assessment Methodology

The United States National Environmental Protection Act, passed in 1969, established a procedure for the evaluation of environmental impacts that has become the general model for similar legislation elsewhere. The national law, known as NEPA, applies to major projects that receive federal funding. At the local level, projects are evaluated according to laws and standards enacted at by the states. In California, the legislation is known as the California Environmental Quality Act, or CEQA. Passed in 1970, CEQA was very closely modeled on NEPA. The law has been amended and refined over the ensuing two decades and is today perhaps the most comprehensive of the state statutes governing environmental quality. For this reason, and because little if any housing development receives direct federal sponsorship today, CEQA will be used in this report as the principal example of impact assessment technology in the United States. Thus when mention is made of American or U.S. procedures, reference in fact is being made to California law and practice.

All proposed actions, known in the United States and in this report as "projects," that require "discretionary" decisions are subject to review under CEQA. Discretionary decisions are distinguished from "ministerial" actions which are routine and can be made by staff without reference to the elected officials of a community. An example of a ministerial action is the granting of a final building permit for a project which has already received approval. Discretionary decisions, which include the approval of plans for development projects, cannot be made until an environmental review has been completed satisfactorily.

The steps in the planning and environmental review procedure for projects subject to CEQA are listed in Table 2 and shown diagrammatically in Figure 1. They are described in summary below.

The Application -- Review the application for completeness. As in the Portuguese procedure, all prospective developers must submit a standard set of plans and information when applying for approval of a project. The agency with responsibility for approving the project, usually a municipality, is known as the "lead agency." Upon receipt of a development application, the lead agency is required, within 30 days, to determine the completeness of the application.

TABLE 2. STEPS IN THE U.S. ENVIRONMENTAL REVIEW

Application Submitted to the Lead Agency
Preliminary Review/Determination that Project is Subject to CEQA
Determination that Application is Complete (30 days)

Start of EIR/Negative Declaration Time Limits*

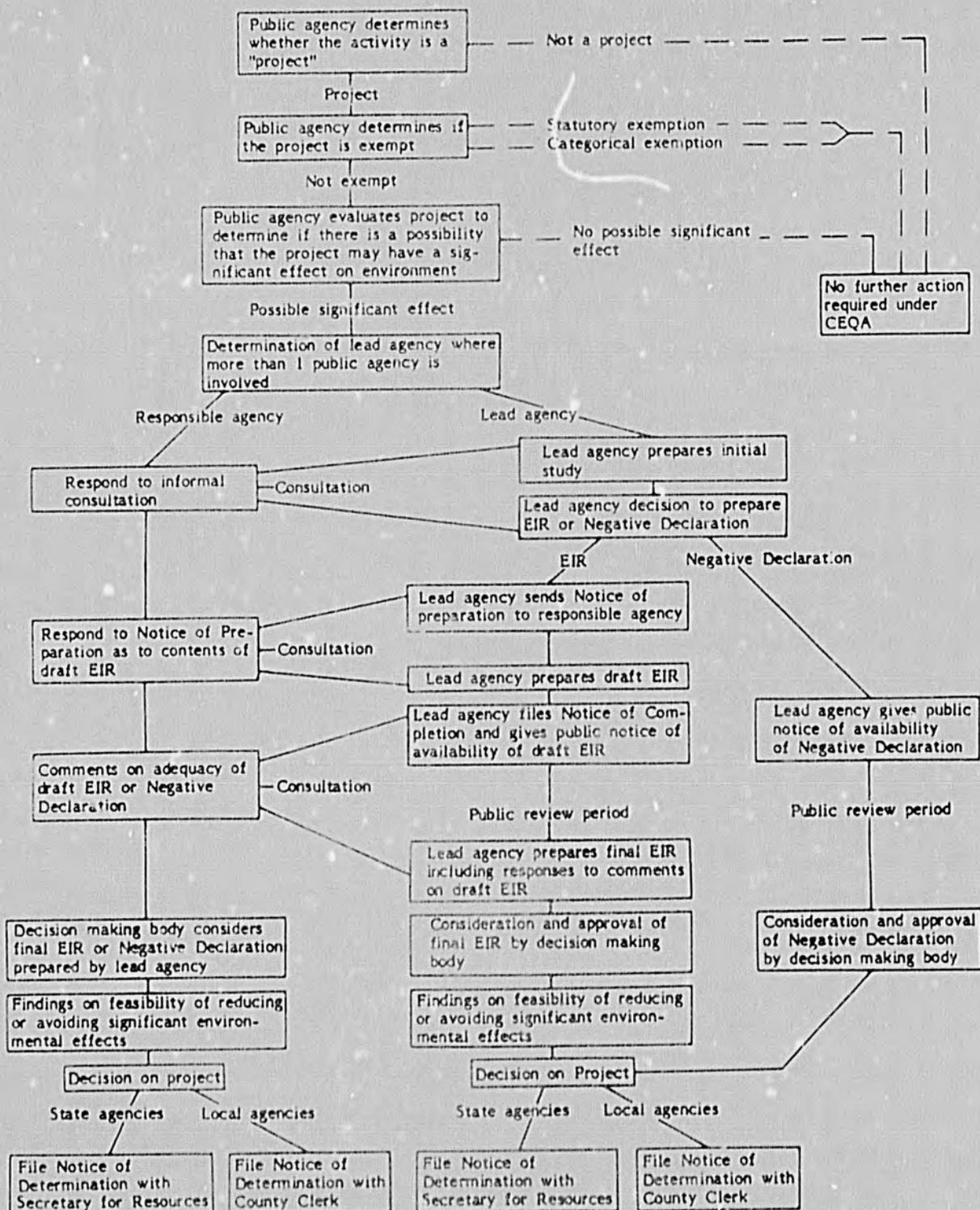
Initial Study Performed
Consultation with Responsible and Trustee Agencies
Decision to Prepare EIR or Negative Declaration (30 days)

Environmental Impact Report
Notices of Preparation Sent to Responsible and Trustee Agencies
Responses to Notice of Preparation Sent to Lead Agency (30 days)
Draft EIR Prepared (Consultant Retained)
Draft EIR Submitted for Review
State Agencies and Public Review (30-45 days)
Lead Agency May Hold Public Hearing
Written Comments Received
Final EIR Certified by Lead Agency (within 1 year after acceptance of complete application)
Agency Makes Final Decision on Project (in the case of a tentative map within 45 days after certification)
Notice of Determination Filed (within 5 working days of project approval)
Responsible Agencies Act on Project

Negative Declaration
Mitigation Measures Identified
Proposed Negative Declaration Prepared
Negative Declaration Circulated for Review (including Initial Study)
Responses to Negative Declaration Received
Lead Agency Incorporates Comments
Final Negative Declaration Prepared (within 105 days after acceptance of complete application)
Negative Declaration Adopted (within 180 days after application accepted)
Lead Agency Makes Decision on Project and Findings (within 45 days of adoption of the Negative Declaration)
Notice of Determination Filed (within 5 working days of project approval)
Responsible Agencies Act on Project

*Note: Where no specific time limits are established, the action must occur in a timely manner so as to ensure that overall time limits for adoption or certification will be met.

FIGURE 1. THE CALIFORNIA ENVIRONMENTAL REVIEW PROCESS



The Initial Study -- Prepare a preliminary evaluation of potential significant environmental impacts. Each complete application must receive a preliminary environmental assessment, or initial study, the purpose of which is to determine whether the project may have any adverse effects on the environment. The determination is made using an Environmental Checklist, a copy of which may be found in Annex C.

The Negative Declaration -- Prepare a Negative Declaration if no significant impacts are anticipated. Following the initial study, certain projects, especially those that conform with the municipality's General Plan and zoning, may receive a Negative Declaration, becoming eligible for immediate planning consideration and approval.

The Environmental Impact Report -- Prepare an Environmental Impact Report if significant environmental impacts are expected. All projects that do not qualify for a Negative Declaration require the preparation of an Environmental Impact Report (EIR). These projects include:

- Major planning programs, including General and Specific Plans (comparable to PDMs and PGUs); the EIRs for these programs are required to be as comprehensive as possible so that proposed development projects in conformance with the overall plan can receive negative declarations;
- Projects that are not in conformance with the General Plan;
- Projects in locations where significant changes in land use, environmental conditions, or environmental knowledge have occurred since preparation of the General Plan and its accompanying environmental assessment; and
- Very large or complex projects that could not be fully anticipated in the General Plan.

In addition, many projects receive EIRs because the level of detail in the General Plan EIR is insufficient to justify a negative declaration.

Content of the EIR -- Establish the scope of issues to be addressed. Once it has been determined that an EIR is required, the lead agency sends out a notice to all potentially affected government agencies, interested organizations and individuals, including a description of the project and the Initial Study. The EIR is bound to address all items in the Environmental Checklist marked "Yes" or "Maybe." In addition, the scope of the examination may be expanded by responses to the Notice of Preparation and by a public meeting, known as a Scoping meeting, where the public can raise additional concerns.

Impact Assessment -- Describe each potential impact and evaluate its significance.

The EIR preparers must analyze the nature of the environmental impacts that would potentially result if the project were to be carried out. They are also required to determine whether each impact would be "significant." The significance of a potential impact can be measured in several ways:

- according to standards set by national or state laws, such as those governing air quality and water quality;
- according to generally accepted scientific standards;
- according to policies in adopted local general and specific plans; or
- through interpretation of locally established values, such as the importance of an informal pedestrian connection or a vista that might be blocked by the implementation of the project.

Other Required Analyses -- Address alternatives to and cumulative impacts of the proposed project. The EIR must also identify and address the relative potential impacts of feasible alternatives to the proposed project, such as alternative sites, larger or smaller projects, or alternative uses or mixes of uses. The document must also contain sections comparing the proposed short-term land use with any lost opportunities for long-term productive use of the environment, and analyzing the cumulative impact of all the potential impacts associated with project implementation in the context of other existing and proposed developments.

In each topical area, the EIR must present text and mapped material describing the existing conditions that could be altered by the proposed project and other conditions relevant to an understanding of the potential impacts and their significance.

Impact Mitigation -- For each significant impact recommend a way to reduce the impact. For each significant potential impact, the EIR must recommend feasible means to reduce the impact to a "less-than-significant level." In each case, it is necessary to demonstrate the direct connection, or "nexus," between the impact and the recommended mitigation measure. Based upon the identification of mitigation measures, the EIR must also note which of the options available, including the proposed project, is the environmentally superior alternative.

The ideal mitigation measure or superior alternative is often a revision of the project plan or use of an alternative site to avoid the impact, such as intrusion into a stream buffer.

However, mitigation by avoidance is not always physically or economically feasible if the objectives of the proposed development are to be met. For example, a recommended reduction in project size to preserve an appropriate stream buffer might conflict with the objective of providing housing affordable by a lower income segment of the population. It might be possible to recommend expanding the buffer elsewhere on the site to compensate for the intrusion, without an overall reduction in project size. If no feasible mitigation were available, the Lead Agency would have to determine whether the benefits of approving the project outweighed the significance of the impact.

EIR Preparation Requirements -- Ensure that the EIR is an objective, "full disclosure," readily understandable document. The environmental review procedures are designed to produce documents that provide all potentially affected government agencies and elected officials as well as members of the public with the information they need to understand the potential effects of a proposed project. The law requires environmental impact reports to be prepared by impartial professional analysts, presenting objective judgments regarding potential impacts. It also demands "full disclosure" of all known aspects of a proposed project. The findings of the analysis must be presented in the Draft Environmental Impact Report (DEIR) in a form and language that can be readily understood by lay readers.

EIR Review and Comment -- Make the Draft EIR available for public comment. The DEIR is made available for comment for a period of 30 to 45 days, depending upon the complexity of the project. At the end of the comment period, the professional analysts are required to prepare responses to all written comments in a second volume. The two volumes together constitute the Final EIR which is then used by the elected officials of the lead agency in deciding whether to approve the project.

A full environmental assessment may be prepared for a residential project comparable to the average INH-funded development (i.e. approximately 100 units) in about eight to twelve weeks. For larger, more complex, or more controversial projects the process tends to take considerably longer. For most projects (excluding General Plans and similar major programs), the law requires approval or denial within one year from the date of the completed application.

3.2 Inappropriate Elements of U.S. Environmental Review Procedures

It will be evident from the foregoing discussion that the time and effort required to prepare the average EIR is often substantial and may add significantly to the cost of developing a project. This possibility became of sufficient concern in the mid 1980s that the then Governor of the state

appointed a task force to look into the need for and means of improving the implementation of CEQA. The particular focus of the Governor's task force was costs on social housing project costs and on lower-cost market-rate housing.

The task force found general acknowledgement throughout the state that over the 15 years of CEQA's existence, measurable improvements had taken place in the overall quality of the environment and in the quality of individual projects. In a survey of private developers, the task force found that the larger and more well-established residential developers recognized and appreciated the fact that improved quality meant improved marketability. Moreover, those developers tended to anticipate environmental concerns and incorporate them into their project plans, saving review time and costs. To smaller or less experienced developers, however, compliance with CEQA was seen as just another burden added to the escalating prices of land, materials, labor and financing.

Efforts have been made over the past decade to streamline the requirements of the law and to encourage developers and municipalities alike to use the requirements of the law as a guide to thoughtful project planning. Unfortunately, the effectiveness of those efforts has been undermined by the growing manipulation of the environmental review process by those opposed to development projects. The reader will recall that the law gives the public the right to have full access to the EIR, to comment on it, and to receive reasoned responses. This fundamental and highly-valued aspect of the American review necessarily prolongs the process. However, delays have grown increasingly serious in recent years.

In the early years of CEQA, the public review element produced beneficial results. It led to a more informed public and elicited information that often supported improvement of a project. More recently, however, a reluctance to accept development or change of any sort has become apparent in many communities. For those expressing so-called NIMBY (Not In My Backyard) sentiments, the CEQA process has become a potent tool. Many groups are now adept at posing both reasonable and unreasonable questions at such length and in such large numbers that the time and cost of review is greatly increased.

Elected bodies have the authority, subject to court challenge, to find that "overriding considerations," such as the need for social housing, support approval of a project even when its potential significant impacts cannot be mitigated to a less than significant level. In some instances, however, elected officials, alarmed at the potential cost of preparing responses and possible legal proceedings, or unwilling to overrule a vocal minority interest group, may terminate an otherwise worthy project.

Perhaps the principal reason to depart from the American model is that environmental review is generally conducted after the preparation of a project plan, rather than simultaneously. While

a few municipalities attempt to do so, it is not yet common for EIRs to be prepared in concert with the planning process. In most instances, however, EIRs are begun following completion of project planning. Both NEPA and CEQA were designed to achieve more environmentally-sensitive planning. However, it is doubtful that they were intended to result in a substantial extension of planning time requirements, duplication of efforts, or creation of a new profession of environmental analysts whose activities are independent of project planners and designers.

3.3 U.S. Procedures Relevant to Current Portuguese Needs

The recommendations presented in this report must be designed to build on the lessons of the American experience so that the pitfalls may be avoided and a system created that achieves environmental improvements in the most cost-effective manner.

The following aspects of the typical United States approach to environmental review appear to have the most potential benefit for a refined Portuguese assessment procedure. It will be seen that at this time the recommendations set aside the provision for public comment.

- **The procedure has universal application** -- virtually all projects must be reviewed, helping achieve an overall improvement in project quality, consistent standards, and more coordinated development;
- **The review is comprehensive** -- using the standard comprehensive environmental checklist, notice of preparation and scoping meetings help ensure that important issues are not overlooked;
- **The review is rigorous** -- objective standards applied to the measurement of impact significance include locally adopted policy as well as applicable legal or scientific standards, while scientific standards of analysis and peer review are intended to further protect objectivity;
- **The review is systematic** -- potential impacts and the effects of recommended mitigation measures must both be expressed quantitatively as well as qualitatively wherever possible;
- **The approach acknowledges dynamic relationships** -- between the natural and the man-altered or developed environment and between direct and indirect causes of environmental change; the approach therefore gives greater attention to social and economic aspects of development than procedures based on the EC Directive -- traffic impacts, infrastructure availability, service availability, and fiscal impacts are addressed in residential project EIRs;

- **The review fosters interagency coordination** -- all government agencies and organizations potentially affected by a prospective development receive early notification of the proposal; "responsible agencies" which need to add infrastructure or supply utilities or services are obligated to respond to the Notice of Preparation and comment on the EIR;
- **The review acts a planning tool** -- ensuring that general plans are implemented in the manner intended and addressing aspects of development siting, phasing and integration too detailed for general plans;
- **The process requires municipalities and prospective developers to identify important elements of the natural environment** -- including plant and animal species, their habitat, and ecological relationships, and to avoid impacts to them, take steps to protect them, or compensate for their loss.

4. RECOMMENDATIONS FOR REFINING ENVIRONMENTAL PLANNING AND ASSESSMENT PROCEDURES FOR SOCIAL HOUSING PROJECTS

4.1 Introduction

The twin aims of a revised environmental assessment procedure should be to ensure the overall health of the environment and achieve quality social housing projects. The recommendations in this chapter are designed to help achieve those aims with maximum efficiency, expanding the content of the environmental review and at the same time sharpening the focus of the project planning and assessment process. They seek the comprehensiveness and rigor of the American approach in a process specially designed to meet Portuguese needs and minimize costs and delays. Characteristically, the process would:

- **require simultaneous environmental assessment and planning;**
- **proceed in stages and require a sequence of progressively more detailed reviews at each stage, so that necessary changes can be made in a project well in advance of final site and grading plans;**
- **emphasize incorporation of multipurpose mitigation measures into projects; and**
- **promote an understanding of the principles and benefits of environmental sensitivity on the part of developers in partnership with municipal and INH planners.**

The first and most essential requirement of a social housing project is to observe all legal restrictions. As seen in Chapter 2, basic exclusion factors are addressed in the PDM and PGUs and conformance with those plans is a fundamental requirement of the INH. However, Chapters 2 and 3 also demonstrated that merely meeting legal requirements is not always sufficient for good environmental decision-making. The array of additional environmental issues that could be studied, or studied in greater detail, in connection with a residential project is potentially very wide. Therefore, developers and reviewers need a system that facilitates the selection of relevant considerations to supplement the basic legal constraints. The system should also recognize the sequence of decision-making. It is not necessary to address every issue at a similar level of detail at each point in the sequence.

The reader should note that specific recommendations for additional investigations made in Section 4.3 of this chapter are not intended to be comprehensive. They are provided for illustration and explanation of the contents of a sensitive analysis. However, they could also form the basis for more detailed environmental standards or guidelines in the future.

4.2 Conceptual and Organizational Framework for Assessment

To help achieve the desired level of focus and efficiency, the recommendations in this chapter are presented within a conceptual framework, summarized in Table 3.

The conceptual framework is clearly linked to the objectives of social housing and the steps in the residential development planning process but is broadly relevant to other land uses. The environmental issues addressed within the framework will vary in importance according to the principal types of projects and sites being proposed.

Social Housing Development Objectives. In addition to the basic need to observe legal restrictions, the key objectives of the planning a social housing project may be summarized by three terms: cost, safety, and amenity. These objectives may be defined as follows:

- 1. Cost -- Keep the cost of the development low,** by minimizing planning and processing time, controlling construction costs, and designing for low maintenance;
- 2. Safety -- Build a development that ensures the safety of residents** from such hazards as landslides, floods, and ground or building failure due to earthquakes; and
- 3. Amenity -- Build a development that provides amenity,** creating a place that is convenient, comfortable and identifiable.

These objectives may be further refined by reference to INH guidelines and by considering the specific needs of the target population.

Key Steps in the Housing Development Process. Project planning and production is a step-by-step process. Sound environmental planning calls for a carefully-sequenced environmental assessment, both by prospective sponsors of social housing and those performing environmental review. In their simplest terms, the sequence of steps can be defined as follows:

- 1. Site Selection -- Confirm site or screen sites for suitability:** The first step in the process is identification of a site and confirmation of site suitability. Where potential sites have been identified by INH or a municipality as suitable for social housing, it is unlikely that any "fatal flaw" would render them unsuitable for such a use. Nevertheless, to be fully assured, and to select among, or "screen," alternative site, prospective developers should conduct a rapid preliminary assessment.

TABLE 3. ELEMENTS OF THE RECOMMENDED CONCEPTUAL FRAMEWORK FOR ENVIRONMENTAL PLANNING AND REVIEW OF HOUSING PROJECTS

- **Establish and Use Project Objectives as the Basis for Assessing Impact Significance:**
 - Cost
 - Safety
 - Amenity

- **Measure Overall Project Environmental Quality by:**
 - Compliance with Legal Restrictions
plus
 - Achievement of Cost, Safety and Amenity Objectives

- **Incorporate Environmental Considerations at Each Step in the Project Planning and Development Process:**
 - Site Selection
 - Site Assessment
 - Site Planning and Design

- **Consider Market, Project and Location Type in Assessment Procedure:**

Location:	Target Market/Product Type:		
	High Density Apartment	Single-Family Subdivision	Mixed Use/ Mixed Density
City Undeveloped	●	●	●
City Infill	●		●
City Redevelopment	●		●
Suburban	●	●	●
Rural		●	

2. **Site Analysis -- Understand the selected site's conditions:** Assessment of the character of the selected site, from published data, supplemented where necessary by on-site surveys, to achieve an understanding of factors that could act as constraints to certain types of development or development of certain areas of the site, as well as factors representing opportunities for development.
3. **Site Planning and Design -- Respond to constraints and opportunities:** Preparation of a site plan and preliminary architectural plans that respond to and work with site constraints and opportunities. This step would emphasize multi-purpose mitigation measures -- features designed to add value to the project as well as mitigating several potential environmental impacts at once.

Each step has different information and analysis requirements, moving from a rapid check of many topics in limited detail during site selection to investigations of a smaller number of topics in greater detail at the site assessment stage.

Following the elements of the assessment at each step, as described more fully in Section 4.3, would improve a developer's ability to achieve the three key objectives. It would be also be advisable to organize planning agency and INH review schedules to recognize these stages.

The INH review procedures and application requirements are, appropriately, already staged. As summarized in Chapter 2, the preliminary review occurs after preparation of a site plan, grading plan and preliminary architectural plans, while the final review is a check on the architectural and construction details. Ideally, both municipal and INH staff should also be available to provide an informal review, as well as information and advice if requested, at the site selection and site analysis stages. Experience has clearly shown that developers could save time on project revisions and avoid rejected projects if agency staff were available to meet with them sufficiently early in the process.

Types of Location and Development. Potential environmental impacts and information requirements will also differ to some extent according to the project type. A majority of projects facilitated by INH are high or medium high density projects within or on the periphery of cities. However as the last element in Table 3 indicates, lower density single family projects in suburban or rural locations are occasionally considered. Currently, all or most projects are proposed for undeveloped sites. The outline matrix in Table 4 is filled out for a mixed-density project on an undeveloped city or suburban site. If more projects are proposed to occupy urban infill or redevelopment sites in future, the types of issues will change accordingly.

TABLE 4. RELATIONSHIP OF ENVIRONMENTAL FACTORS TO MAJOR HOUSING OBJECTIVES*

Objective:	Cost	Safety	Amenity	Legal
Topic:				
Topography	●		●	●
Geology	●	●		
Soils		●		●
Drainage		●		●
Vegetation		●	●	●
Aspect				
- solar exposure			●	●
- wind direction			●	
- views			●	
Land Use		●	●	
Transportation	●	●	●	
Noise			●	●
Toxic Materials	●	●		
Water Quality		●		●
Air Quality		●		●
Infrastructure	●		●	
Services			●	
Cultural			●	●
Visual Quality			●	

Based on a high or mixed density development on an undeveloped city or suburban site.

4.3 Study Requirements at Each Step in the Planning Process

Before selecting, assessing and planning an appropriate site, it is essential to be clear about the objectives to be met by the proposed development. The target population should be identified so that conditions can be considered in terms of such characteristics as household size, employment skills, and needs for schools, day care, training centers, shops, parks, and transit. Once these objectives are defined, the planning process should proceed according to the steps summarized in Table 5 on page 35 and described below.

Step 1: Site Selection. The brief study required to select among several potential sites or confirm a preselected site should be a general overview. Such a study is similar to a "due diligence" study that is increasingly being required by financial institutions in the U.S. It would respond as far as possible to the impact checklist in Appendix D and would typically cover the following topics:

- **General Location** -- A check on whether the site is suitably designated on the PDM; whether existing or planned uses adjacent to the site are compatible with the proposed residential development; whether the site is close to existing or planned employment sources, transportation routes, and public transit; and whether needed utilities and services are available or planned to come on line prior to construction.

Because the PDM covers a 10-year time horizon, it is not always possible to determine the answers from the plan and some additional preliminary research will likely be required.

- **Physical Conditions** -- A quick search for fatal flaws, such as the presence of seriously unstable soils, flood hazards, toxic or hazardous materials on site, nearby hazardous uses, and protected or highly valued resources. It could also become necessary to check on the possible presence of important natural resources such as wetlands and other endangered species habitat, since mitigation of impacts can be costly.

The PDM data maps at 1:25,000 appear to provide adequate information for purposes of site selection on topography, geology, soils, drainage, and vegetation that poses a wildfire hazard. However, prospective developers will need to contact the municipality planners to obtain information on infrastructure and service availability. The municipality may be able to advise on the possible presence of any toxic or hazardous materials. Since investigation of the nature and significance of such hazards is very costly, the possible presence of such a problem would probably be sufficient reason to drop the site from consideration.

Following site selection, the prospective developer should document and compare alternative sites considered.

Step 2: Site Assessment. At this stage, to support the planning of a project appropriate to the selected site, a more detailed examination of the site would typically cover the some or all of the conditions discussed below. The order follows a natural, logical progression from geology and topography to the effects of development on air quality, water quality and noise, and can be used in concert with the checklist in Appendix D. Following such a standard "litany" of topics is helpful in ensuring comprehensiveness and identifying interrelationships among impacts.

Information would be obtained from existing sources, supplemented by field studies, where necessary and feasible, and any problem areas on- and off-site would be mapped where necessary to guide precise site planning. Specialists would be required to prepare studies in several of the more technical areas requiring investigation.

- **Topography** -- A thorough understanding of the site's topography is the necessary foundation for assessing slope stability, runoff, access to the sun and views, wind protection, ease of use of outdoor spaces, and ease of development. A detailed slope map should therefore be prepared, including the categories specified by the PDM, 5% or less, 5 to 15%, 15 to 30% and 30% or more, depending on the site. In addition, it may also be necessary to prepare maps showing elevation and the aspect of slopes. In addition, a topographic survey will be required prior to site planning and architectural design.
- **Geology and Soils** -- The geology and soils investigation should cover soil stability, including the presence of deep and/or active landslides and the potential for development to initiate surficial slides; erodibility; seismic hazard, including potential surface rupture, ground shaking and/or liquefaction, and buffer zones along faults, if any; and relative bearing capacity, rippability, etc.

Some of this information is available from the municipalities where technical studies for PDMs have been completed. However, since INH requires a geologic and geotechnical study to accompany the application, it would be advisable to do the study as part of the site assessment. Indeed, municipalities and the INH may wish to encourage developers to conduct at least preliminary geologic studies prior to preparing a site plan.

Protection of agricultural soils and mapped areas of maximum infiltration is essential to flood prevention and could also be essential for aquifer recharge. A part of the environmental assessment should therefore investigate whether adequate measures have been incorporated into the site plan to avoid conflicts with agricultural soils and activities.

TABLE 5. SUMMARY OF STUDY REQUIREMENTS, BY MAJOR STEP

PRELIMINARY REQUIREMENTS -- define project objectives

STEP 1: SITE SELECTION -- For each alternative site, perform a rapid check of:

- General Location** -- PDM designation; adjacent uses; proximity to existing/planned employment sources, transit, transportation routes, general availability of utilities and services.
- Physical Conditions** -- Presence of potential fatal flaws -- such as the presence of unstable soils, flood hazards, toxic or hazardous materials, valued/protected resources, or endangered species habitat.

STEP 2: SITE ASSESSMENT - For selected site, assemble, map and analyze data:

- Topography** -- Slope, by PDM category, elevation, aspect
- Aspect** -- Views, solar exposure, wind direction & exposure
- Geology and Soils** -- Stability, erodibility, seismic response, faults, bearing capacity, rippability, etc.
- Drainage** -- Surface streams and stream corridors, designated flood plain, water quality concerns
- Vegetation** -- Areas with rare plants or plant associations important as wildlife habitat
- Existing Land Use** -- Agricultural soils, forests, commercially valuable minerals, cultural sites, protected area buffers, valued buildings/streetscapes, etc. that need to be respected (by clustering, buffering, ensuring compatible style, etc.)
- Toxic Substances** -- Proximity of any toxic or potentially hazardous materials
- Water Quality** -- Potential for project to result in water quality degradation
- Air Quality** -- Proximity of any sources of air emissions incompatible with housing
- Noise** -- Proximity of any sources of noise that might result in unacceptable interior or exterior noise levels in the project
- Transportation** -- Capacity of access road(s), major streets and highway(s), parking areas, transit service, etc. provision for pedestrians and cyclists
- Utilities/Infrastructure** -- Availability and capacity of water supply, Wastewater treatment, solid waste disposal/treatment, power, gas
- Public Services & Amenities** -- Proximity of parks and open space for play, active and passive recreation, schools, shops, health and emergency services, etc.
- Visual Quality** -- Views to and from site deserving protection
- Cultural Features** -- On-site or nearby features requiring protection or suggesting incorporation into the project

STEP 3: PLANNING AND DESIGN

A. Site Planning to Achieve Safety Objectives:

- **Avoid:**
 - Landslides
 - Seismic instability
 - Flood hazards
 - Toxic and hazardous materials
- Incorporate features to limit the effects of external hazardous/undesirable conditions

B. Site Planning to Achieve Cost Objectives:

- At a minimum, observe identified cost ceiling
- Meet legal requirements for speed of approval
- Identify cost-effective, multi-purpose ways to address environmental constraints

C. Site Planning to Achieve Amenity Objectives:

- Create a sense of place and identity:
 - Use constraints positively
 - Incorporate cultural features
 - Protect and incorporate views
- Make development comfortable -- plan for:
 - Maximum passive heating and cooling
 - Maximum wind protection
- Integrate the development with its surroundings and incorporate features to limit the project's adverse environmental effects
- Draw on solutions already available in historic patterns

FINAL CHECK

- Review for adherence to preliminary and interim reviews
- Final site plan, grading plan
- Architectural plans
- Specifications

- **Drainage** -- Existing legal requirements for protection of various types of rivers, streams and riparian buffer zones, as well as designated flood plains, infiltration zones, and stream formation zones, are quite specific (see Table 1). At the scale of a typical housing project, however, it may also be necessary to assess the adequacy of the minimum buffer zone, for purposes of protection of water quality, protection from erosion, and/or protection of riparian vegetation. In addition, it may be necessary to identify minor drainageways too small for inclusion of PDM or PGU maps.

Storm drainage of sites only recently became a legal requirement and storm drainage systems are not yet well developed. In any case, even a modern system of main drains can become overloaded and lead to flood problems because it is often infeasible to build a system large enough to meet all future needs. Thus the assessment may need to address on-site infiltration of precipitation and storm runoff retention or detention to reduce flood peaks. In many parts of the U.S., particularly in the states of California and New Jersey, a new developments must not result in any more than the existing amount of runoff from the site.

- **Vegetation** -- Any areas with associations of plants which pose a potential wildfire hazard must be identified by law. In addition, it may be necessary in future to identify areas containing rare plants or important as wildlife habitat. For example, legal objectives for protection of areas such as the National Ecological Reserve would be furthered by encouraging protection of upland habitats that are linked directly or indirectly with the REN.
- **Existing Land Use** -- For reasons of both safety and amenity, it is important to identify features and resources, such as agricultural soils, forests, commercially valuable minerals, cultural sites, protected area buffers, valued buildings/streetscapes, etc. that need to be respected (by clustering, buffering, ensuring compatible style, etc.). The analysis of existing and planned adjacent land uses would also identify the need for pedestrian and/or vehicular connections or other means of achieving integration with the surrounding community.
- **Transportation and Transit** -- Typical U.S. EIRs are required to present detailed data and analysis regarding the potential traffic associated with a project and anticipated impacts on affected roads and highways. Traffic generation by an individual social housing project may not be significant where transit service is adequate. Nevertheless, the assessment should consider local road capacity, the potential for significant cumulative traffic impacts, and the safety of access and egress from major roads. The adequacy and convenience of pedestrian paths, bicycle paths, bus stops, and parking areas should also be addressed.

- **Toxic Substances** -- At the site assessment stage in a residential project, there should normally be no remaining concerns regarding safety from toxic or hazardous materials. Unsafe or potentially unsafe sites should have been screened out in the site selection process. Nevertheless, the item should be included in the checklist to prevent any potential impact from being overlooked. Sources of impact could be stored hazardous or toxic wastes in the vicinity of the site, airborne or waterborne (ground or surface) pollutants, or contaminated soils.
- **Water Quality** -- A typical EIR examines the potential for a project to result in degradation of surface or ground water quality. A social housing project would have little or no potential for such an impact if an adequate sanitary sewer collection and treatment system and an adequate solid waste collection and disposal or treatment system existed. (See below under infrastructure and services.) The potential impact of any existing water quality problems would be covered in the previous section.
- **Air Quality** -- CEQA requires EIRs to determine whether any air pollutants generated by a project would have a significant impact. In the case of a residential project, new traffic generation could have a significant impact in an area already suffering from poor air quality, especially if the traffic were to result in or worsen congested roads. Mitigation might require road widening or, more appropriately, improved transit service. Again, proximity to any sources of air emissions incompatible with a residential environment should have been identified during site selection and their absence would be confirmed in the toxic substances section.
- **Noise** -- The site assessment should identify any nearby sources of noise that might result in unacceptable interior or exterior noise levels in the development. Mitigation might be simply achieved by building orientation and/or screening. The need for sound insulation could add unacceptably to project cost, while high levels of noise affecting open sitting and play areas could render them unusable.
- **Utilities** -- The assessment should confirm the availability and capacity of potable water, wastewater treatment, solid waste disposal/treatment, power, and natural gas supply to serve the proposed development. Projections of water use and wastewater and solid waste generation allow municipalities and service providers to be alerted to the timing and magnitude of new demand.
- **Infrastructure** -- The existence or imminent completion of major infrastructure elements should also have been addressed adequately at the site selection stage. Further consideration here would identify appropriate points of connection and any special conditions through communications with public works authorities.

- **Public Services and Amenities** -- This section of the assessment would reexamine the adequacy and proximity of off-site parks and open space for organized recreation, play, and passive recreation. Other topics to be considered would include the location of, or need for, schools, libraries, childcare requirements, health services, and police, emergency and fire protection services.
- **Visual Quality** -- Finally, the assessment should cover the visual character of the site and its surroundings, both natural and built. The assessment should identify views to be protected, both to and from the site, and suggest needed connections with nearby buildings or other features.
- **Cultural Features** -- The PDM identifies historic and prehistoric structures and artifacts that must be protected. The individual site assessment should consider how any cultural features might be connected with the project or suggest a theme or motif that might be integrated into its design.

Following the site assessment, the developer should use the impact checklist in Appendix D once again and make a preliminary assessment of the potential impacts and cumulative effects of the project.

Step 3: Site Planning and Design. This step fits the development program, the project objectives, and the needs of the anticipated residents to the site, drawing for guidance on an understanding of site constraints.

- **Site Planning to Comply with Legal Requirements.** After an adequate selection process, a selected site should be in compliance with most of the restrictions currently imposed in the general area of the proposed development. However, the site plan will need to provide for at least the required buffers along any streams and leave open any areas exceeding 30% slope on the site itself.
- **Site Planning to Achieve Safety Objectives.** Organization of the site should avoid any identified landslides, areas of seismic instability, flood hazards, toxic materials or hazardous activities. Adequate buffers need to be provided and in some cases, such as landslide deposits, unbuildable areas may be usable as park space.
- **Site Planning and Design to Achieve Cost Objectives.** At a minimum, INH reviewers require identified cost ceilings to be observed. Their emphasis of the review has tended to be on cost-effective methods of building. However, careful site planning can also control excavation and foundation costs, reduce the length of water, sewer and drain pipes, reduce the length and area of access roads and other paved areas, moderate indoor

temperatures, and reduce open space maintenance costs.

In addition to location of development on the site, a combination of other site planning and design features can further reduce the cost of on-site infrastructure, such as a storm drainage system, and achieve multiple objectives. Runoff can be reduced by retention of areas of natural vegetation, provision of low-maintenance landscaped open space, and use of gravel and cobble rather than concrete for hard surfaces. A net increase in runoff from the site may then be achievable by directing runoff from gutters along streets, sidewalks and steps into existing streams or naturalized drainage channels, using grease traps for rough filtration and check dams to dissipate energy. Located in areas that are unsuitable for building, channels can be incorporated into open corridors containing landscaped buffers and pedestrian paths and, may be combined with retention or detention basins, if necessary.

In addition to the cost effectiveness of multi-purpose approaches to environmental constraints, speedy preparation of a site plan that meets legal requirements aids in reducing overall development costs.

- **Site Planning to Achieve Amenity Objectives.** Aspects of planning for amenity include the incorporation of historic buildings, cultural features, and views into a project, maximum provision for passive heating and cooling, maximum wind protection, integration with surrounding residential developments or other land uses, and the use of solutions to environmental constraints available in historic land use and building patterns.

Once again, a good site plan can mitigate several impacts and achieve more than one objective simultaneously. For example, protection of vegetation, such as riparian corridors, woodland or old plantations, can provide windbreaks and shading from the sun, retard erosion and runoff, shelter wildlife habitat and movement corridors, screen undesirable views while framing others, and generally improve the visual quality of a project. Increasing the density in one part of the site may permit substantial retention of such valuable natural features.

It is evident from the foregoing discussion that a positive approach to site constraints can help to create a sense of place and identity. On steep sites, for example, high density single-family or terraced low-rise apartment buildings can be linked by steps for pedestrian movement through a development. Such a pattern offers the opportunity for privately controlled space where residents can plant shade trees and vegetable gardens, participating in the maintenance of total open space. Where environmental conditions reduce the area suitable for development, tall buildings may be an appropriate response. However, the open portion of the site should be capable of remaining in its natural state

as far as possible so that maintenance costs are reduced, and ecological and amenity values are retained. In either case, the resulting development would likely offer an environment superior to many typical high rise buildings that are surrounded by open space that is inhospitable, unsightly and hard to maintain.

5. SUMMARY AND ACTION RECOMMENDATIONS

This final chapter summarizes the recommendations of this report for overall improvement of the environmental assessment process and outlines several actions that should be taken to put the recommendations into effect.

5.1 Summary of General Recommendations

The comparative studies of procedures and practice presented in Chapters 2 and 3 suggest that while the Portuguese environmental review is straightforward, it lacks comprehensiveness and detail. Environmental review in the U.S. has achieved a high level of rigor but has become burdensome and not consistently effective. The approach presented in Chapter 4 aims to combine rigor with practicality. **The most important characteristics of the recommended approach can be summarized as follows:**

- **Prepare EIRs only for the largest or most complex projects and projects that are not fully in compliance with municipal development plans or the plans for infrastructure, utility delivery and public services.**
- **Establish procedures that encourage integration of environmental considerations throughout the planning process, whether EIRs are required or not, to avoid after the fact assessments and reliance on environmental assessment professionals.**
- **Use a systematic approach to incorporating environmental considerations into the key steps in the planning and design process, site selection, site assessment and site planning to help developers and municipalities save time and money and improve project quality.**
- **Establish objective standards and thresholds to assist in determining the significance of potential environmental impacts and avoid the politicization of the review process.**
- **Encourage developers and municipal reviewers to conduct their environmental review within the conceptual framework for environmental assessment presented in Chapter 4. That conceptual framework is based on the definition of the key objectives of a social housing development project: control of development and maintenance costs; provision of a safe environment; and creation of a place that is convenient, comfortable and identifiable.**

- **Increase coordination among government agencies and encourage early review of development proposals** to ensure appropriate site selection, avoidance of potential hazards and environmental impacts, and timely and adequate provision of infrastructure and services.

5.2 Priority Action Recommendations

1. Strengthen Municipal Planning Documents as the Framework for Environmental Planning and Assessment

The highest priority for municipalities continues to be the adoption of the Municipal General Plans. However, once a PDM is in place, each municipality should begin the process of refining and augmenting its package of general and specific plans, policies, zoning regulations, and environmental data. The following components would help prospective developers and project reviewers to achieve improved project quality:

- **Add standards to PDMs specifically addressing the urban environment**, including retail, community service, school and park standards, park dedication requirements where applicable, and environmental impact "thresholds" for identifying unacceptable cumulative project impacts on urban systems.
- **Ensure that local plans (PGUs) fully address connections with adjacent developments** and infrastructure, appropriate land use relationships and integration into the overall community.
- **Add environmental data and the findings of any special studies conducted for environmental assessments and EIRs to the PDM data base as a "Master Environmental Assessment."** This body of information would be available for use by prospective developers. The data would also support the preparation of an updated PDM at such time as revisions are required by DGOT. All revised PDMs should be accompanied by an Environmental Impact Report.

2. Establish a System for Early Comment by Affected Agencies

- **DGOT should consider setting up a "clearing house" system for ensuring review of proposed projects by all government agencies that may have an interest in the proposed project.** Those agencies include those responsible for infrastructure and service provision and those with responsibility for the quality of the physical and biological environment.

- **Municipalities should consider using the Notice of Preparation (NOP) procedure, even in the absence of a clearing house.** The NOP, including a brief description of the project concept and the environmental checklist, is sent to each potentially affected agency and is an effective method of alerting and receiving comments from those agencies.
- **Agencies responding to the Notice of Preparation should also be asked to comment on Environmental Impact Reports when those are prepared.**

3. Establish a System of Early and Staged Municipality and INH Review

- **Municipalities should make sure that municipal planning staff are available to provide early advices to prospective developers, during site selection, site assessment, and site planning and development.**
- **Establish checklists to be completed at the three key steps in project development: site selection; site assessment; and site design.** Establish a procedure for municipality review of checklists.
- **Enact legislation requiring basic environmental checklist information to be contained in proposed project applications.**

4. Disseminate the Approach to and Benefits of Environmental Planning

- **Prepare a handbook for wide dissemination among developers and municipal planners.** Illustrated with examples and graphics, the handbook would describe the broad array of general information required at the site selection or screening step, the more detailed information and analysis required at the site assessment step, and how to work with cost, safety and amenity constraints in the site planning and design step to achieve project objectives.
- **Continue and expand the program of training courses, initiated with the March 27, 1992 INH Workshop.** The program should communicate to planners and developers the benefits of systematic incorporation of environmental principles into project planning and instill an understanding of environmental quality.

ANNEX A INDIVIDUALS AND SOURCES CONSULTED

Individuals and Agencies

Regional Housing Office/Lisbon, U.S. Agency for International Development

Eng. José Trindade
Mrs. Bonnie Walter
Mr. Edward H. Robbins

Instituto Nacional de Habitação (INH)

Eng. João Paes Vasconcelos, Vogal do Concelho Directivo
Eng. Hermano Silveira Vicente
Arq. Vasco Folha
Eng. Maria da Luz Magalhães

Promocasa

Mr. Carlos Alberto da Silva, Director
Eng. Luís Filipe Alves Pedro

Laboratório Nacional de Engenharia Civil (LNEC)

Eng. Gonçalves Henriques
Arq. Vitor Campos

Camara Municipal de Vila Franca de Xira

Arq. João Rabaça

Centro de Estudos e Desenvolvimento Regional e Urbano, Lda. (CEDRU)

Prof. Doutor Jorge Gaspar, Director

Direcção Geral da Qualidade do Ambiente (DGQA)

Dra. Vitória Bruno da Costa

Direcção Geral do Ordenamento do Território

**Enga. Manuela Mourão,
Arqa. Lucília Maimone**

Comissão de Coordenação Regional de Lisboa e Vale do Tejo (CCRLVT)

**Dr. Calejo Monteiro, Director Regional do Ambiente e Recursos Naturais
Eng. João Tavora, Director Regional do Ordenamento do Território**

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ANNEX B CASE STUDY SUMMARY

SEMINAR CASE STUDY PRESENTATION OUTLINE

Site Selection

The site is located at Quinta da Maranhota, in Póvoa de Santa Iria, Municipality of Vila Franca de Xira.

Available information:

- PDM (Comprehensive Plan of the Municipality)
- PGU (General Development Plan)
- PDM Data Maps: geology, soils, drainage, flood zones, watercourses, ecological and agricultural reserves, existing land use, existing and proposed road and rail networks, water pipelines and reservoirs, and cultural features
- PDM Composite Constraint Map
- Site Topography and Slope
- Surrounding Land Use

Site Assessment

- Elevation
- Slope
- Aspect
- Geology
- Soils
- Natural drainage
- Vegetation
- Existing land use, on-site
- Existing land use, off-site
- Existing and proposed circulation
- Existing and proposed infrastructure
- Existing and proposed services
- Cultural features

Proposed Land Use (See Exhibit 1, Land Account)

- Single-family houses
- 10-story buildings
- 4-story buildings
- Recreation area
- Access
- Circulation
- Infrastructure

Exhibit 1. Site Plan Land Account

US559124040 DA QUINTA DA MARANHOTA

Índices urbanísticos

	Superfície (ha)	Superfíc. de ocup. (m ²)	Índice de ocup.	Nº de fogos	Densidade (fogos/ha)
Zona de Habitação Multifamiliar - Torres	1.3	1398	0.11	95	73.5
Zona de Habitação Multifamiliar - Bandas	2.4	12589	0.52	383	157.5
Zona de Habitação Unifamil. - Moradias	5	36827	0.74	154	35.7
Zona de Equipamento cultural e de lazer	1.7	3104	0.18		
Zonas de protecção	2.3				
SUB-TOTAL	13.7	52918	0.39	632	46.2
Zona a ceder à Associação Projecto Jovem	1				
TOTAL	14.7				

REDE VIÁRIA E ESTACIONAMENTO

Desenvolvimento da rede viária (m)	2570
Desenvolvimento da faixa de estacion. (m)	1170
Superfície das vias de circulação (m ²)	17910
Superf. de estacionamento descoberto (m ²)	5859
Nº de lugares de estacionamento descoberto	234
Nº de lugares de estacionamento coberto	485
Nº total de lugares de estacionamento	720
Nº de lugares de estacionamento /fogo	1.14

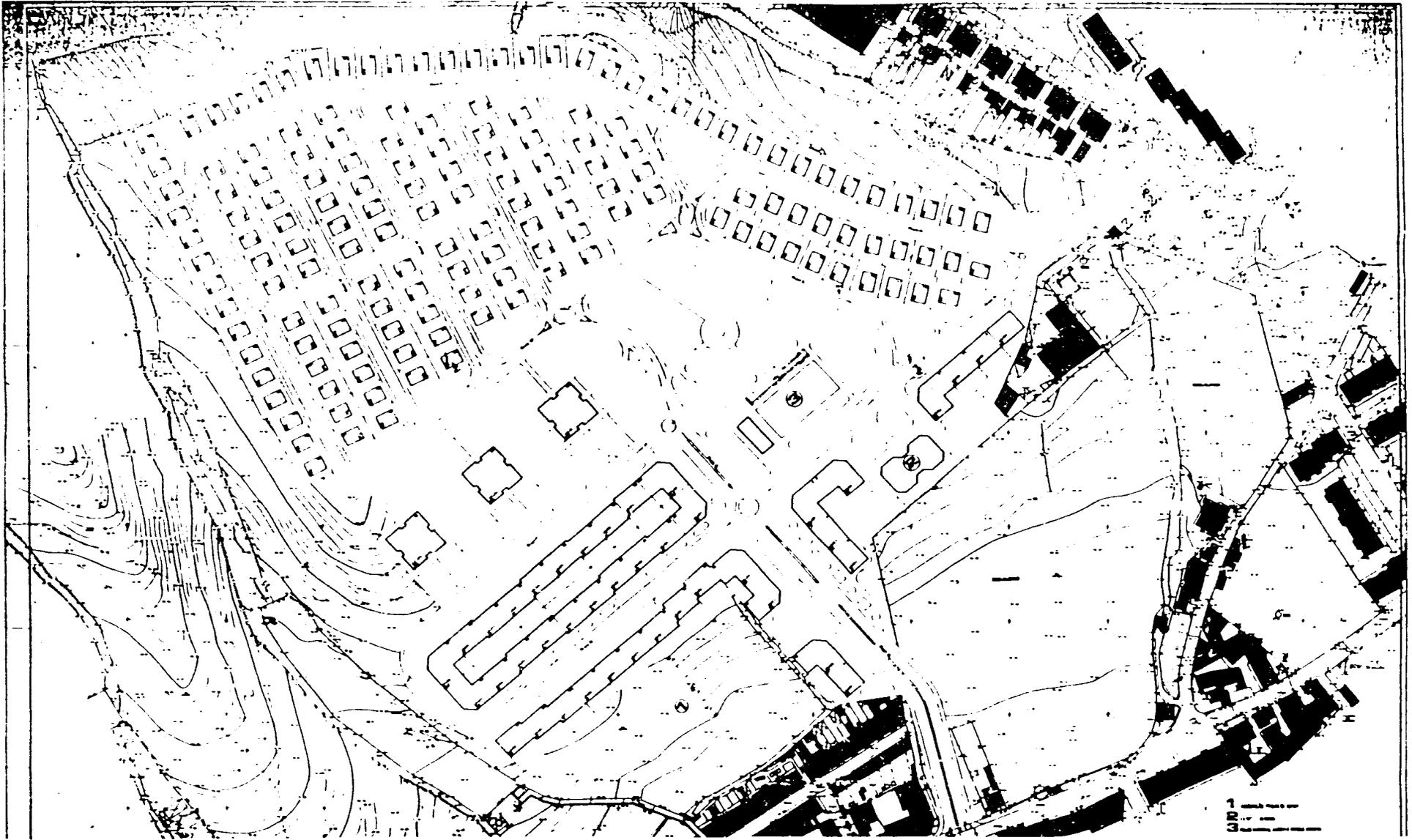


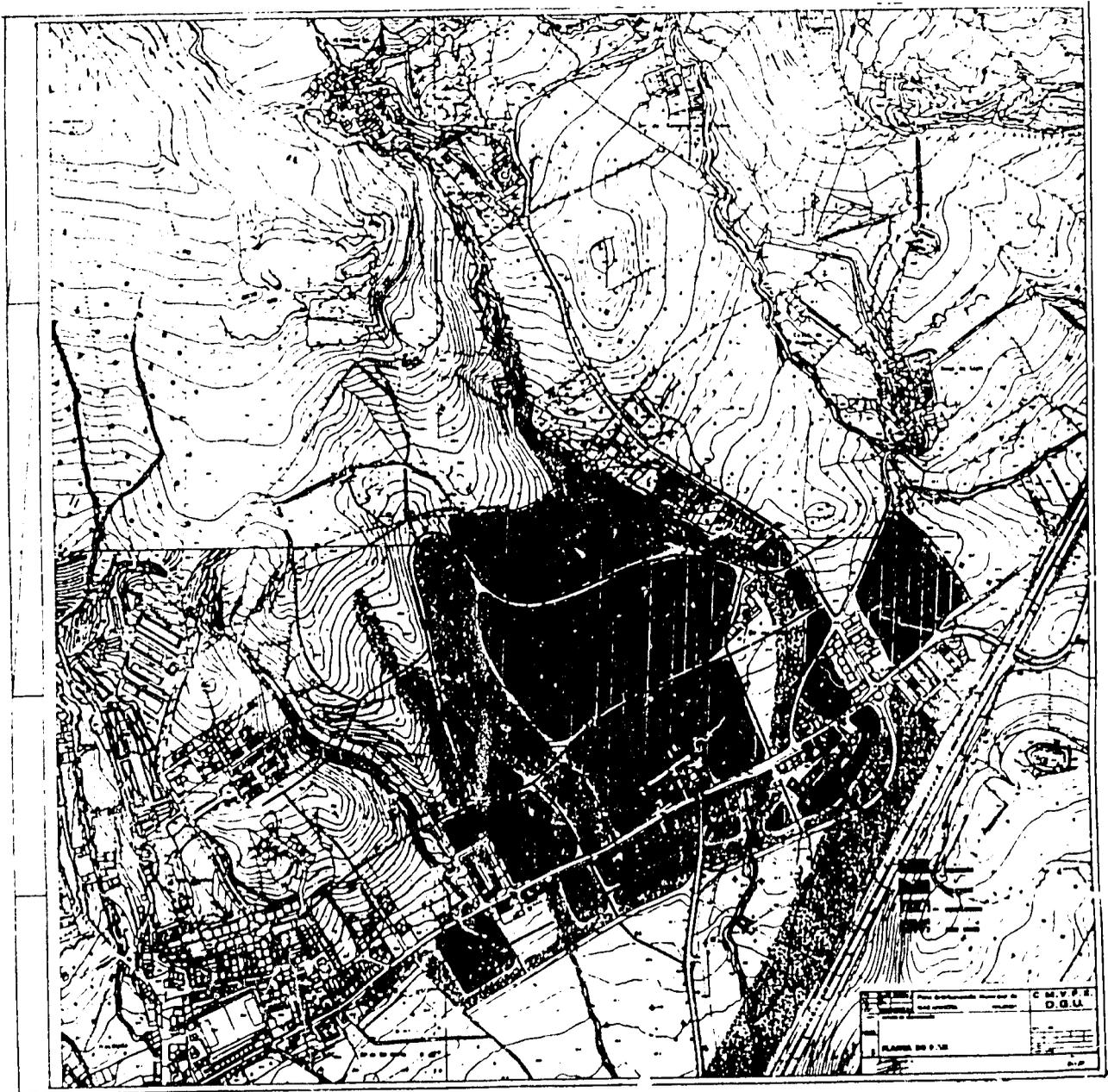
Exhibit 2. Proposed Site Plan

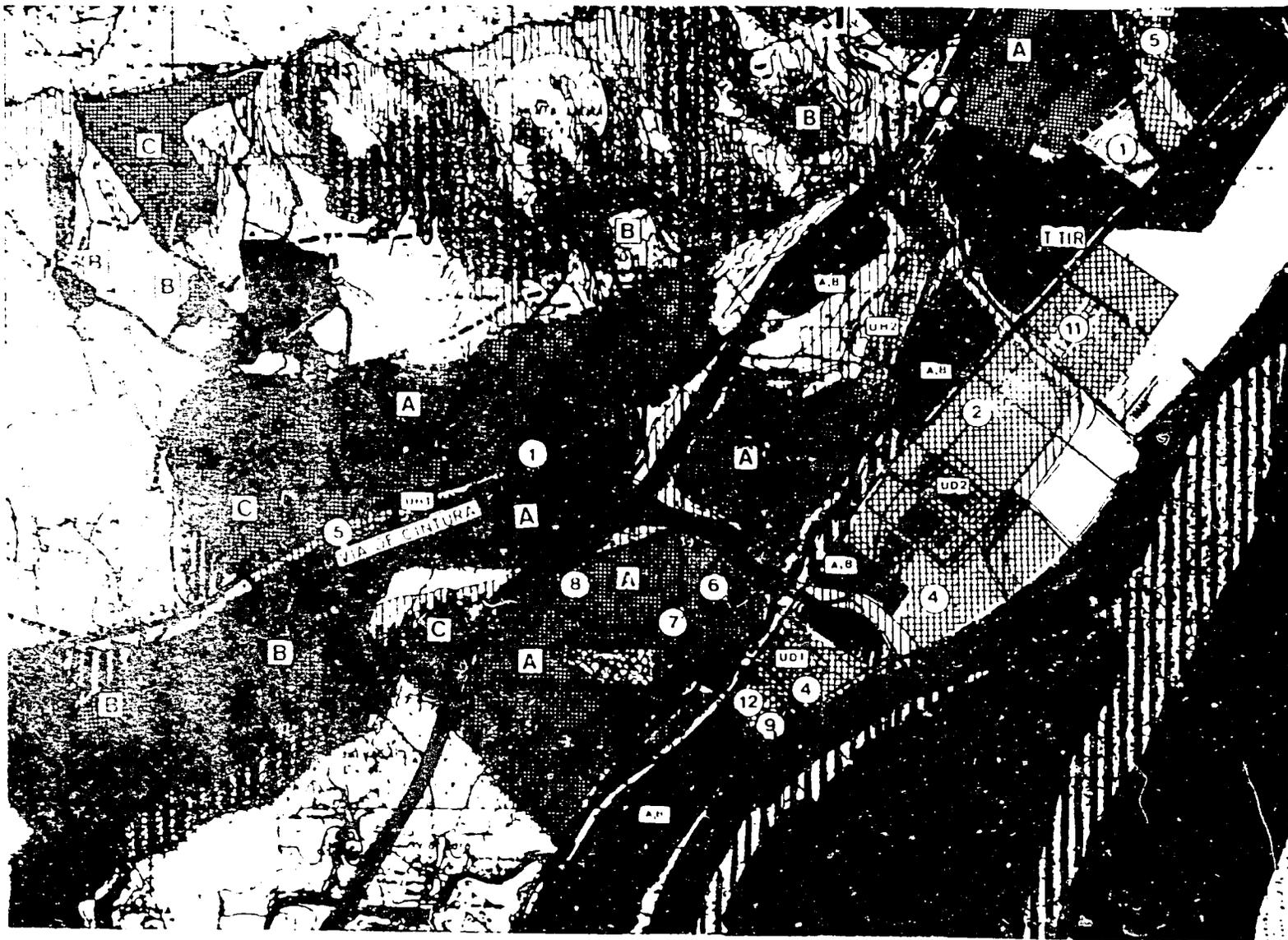


Exhibit 3. Site Topography

54

Exhibit 4. Maranhota PGU Plan





-  - AREA FLORESTAL
-  - RESERVA ECOLÓGICA NACIONAL (REN)
-  - AREAS URBANAS
-  - AREAS INDUSTRIAIS EXISTENTES
-  - AREAS URBANIZÁVEIS
-  - RESERVA AGRÍCOLA NACIONAL (RAM)
-  - AREAS DESTINADAS A NOVAS INDUSTRIAS

Exhibit 6. Existing Land Use Map

5



- A** CABECEIRAS
- B** ÁREAS COM RISCO DE EROÇÃO
- C** LINHAS DE ÁGUA COM DEFICIENTES CONDIÇÕES DE DRENAGEM
- D** RESERVA AGRÍCOLA NACION.
- E** EXPLORAÇÃO DE INERTES
- ⊙ VALORES COM INTERESSE CULTURAL
- Ⓜ IP IMÓVEL DE INTERESSE PÚBLIC
- T** LINHAS DE ALTA TENSÃO
- ▭ VIA DE CINTURA

Exhibit 5. PDM Composite Constraint Map

159

Exhibit 7. Drainage



- A** - CABECEIRAS
- B** - ÁREAS COM RISCO DE EROSIÃO
- C** - LINHAS DE ÁGUA COM DEFICIENTES CONDIÇÕES DE DRENAGEM
- D** - ÁREAS DE INFILTRAÇÃO MÁX.
- - - - - LIMITES DO TERRENO

ANNEX C

**CALIFORNIA ENVIRONMENTAL QUALITY ACT
ENVIRONMENTAL CHECKLIST FORM**

APPENDIX I
ENVIRONMENTAL CHECKLIST FORM
 (To Be Completed By Lead Agency)

I. Background

1. Name of Proponent _____
2. Address and Phone Number of Proponent _____

3. Date of Checklist Submitted _____
4. Agency Requiring Checklist _____
5. Name of Proposal, if applicable _____

II. Environmental Impacts

(Explanations of all "yes" and "maybe" answers are required on attached sheets.)

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
1. Earth. Will the proposal result in:			
a. Unstable earth conditions or in changes in geologic substructures?	_____	_____	_____
b. Disruptions, displacements, compaction or overcovering of the soil?	_____	_____	_____
c. Change in topography or ground surface relief features?	_____	_____	_____
d. The destruction, covering or modification of any unique geologic or physical features?	_____	_____	_____
e. Any increase in wind or water erosion of soils, either on or off the site?	_____	_____	_____
f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?	_____	_____	_____

		<u>Yes</u>	<u>Maybe</u>	<u>No</u>
	g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?	_____	_____	_____
2.	Air. Will the proposal result in:			
	a. Substantial air emissions or deterioration of ambient air quality?	_____	_____	_____
	b. The creation of objectionable odors?	_____	_____	_____
	c. Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally?	_____	_____	_____
3.	Water. Will the proposal result in:			
	a. Changes in currents, or the course of direction of water movements, in either marine or fresh waters?	_____	_____	_____
	b. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	_____	_____	_____
	c. Alterations to the course or flow of flood waters?	_____	_____	_____
	d. Change in the amount of surface water in any water body?	_____	_____	_____
	e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?	_____	_____	_____
	f. Alteration of the direction or rate of flow of ground waters?	_____	_____	_____
	g. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	_____	_____	_____
	h. Substantial reduction in the amount of water otherwise available for public water supplies?	_____	_____	_____
	i. Exposure of people or property to water related hazards such as flooding or tidal waves?	_____	_____	_____

12

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
4. Plant Life. Will the proposal result in:			
a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)?	_____	_____	_____
b. Reduction of the numbers of any unique, rare or endangered species of plants?	_____	_____	_____
c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	_____	_____	_____
d. Reduction in acreage of any agricultural crop?	_____	_____	_____
5. Animal Life. Will the proposal result in:			
a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)?	_____	_____	_____
b. Reduction of the numbers of any unique, rare or endangered species of animals?	_____	_____	_____
c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	_____	_____	_____
d. Deterioration to existing fish or wildlife habitat?	_____	_____	_____
6. Noise. Will the proposal result in:			
a. Increases in existing noise levels?	_____	_____	_____
b. Exposure of people to severe noise levels?	_____	_____	_____
7. Light and Glare. Will the proposal produce new light or glare?	_____	_____	_____
8. Land Use. Will the proposal result in a substantial alteration of the present or planned land use of an area?	_____	_____	_____
9. Natural Resources. Will the proposal result in:			
a. Increase in the rate of use of any natural resources?	_____	_____	_____

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
b. Substantial depletion of any nonrenewable natural resource?	_____	_____	_____
10. Risk of Upset. Will the proposal involve:			
a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	_____	_____	_____
b. Possible interference with an emergency response plan or an emergency evacuation plan?	_____	_____	_____
11. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?	_____	_____	_____
12. Housing. Will the proposal affect existing housing, or create a demand for additional housing?	_____	_____	_____
13. Transportation/Circulation. Will the proposal result in:			
a. Generation of substantial additional vehicular movement?	_____	_____	_____
b. Effects on existing parking facilities, or demand for new parking?	_____	_____	_____
c. Substantial impact upon existing transportation systems?	_____	_____	_____
d. Alterations to present patterns of circulation or movement of people and/or goods?	_____	_____	_____
e. Alterations to waterborne, rail or air traffic?	_____	_____	_____
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	_____	_____	_____
14. Public Services. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:	_____	_____	_____
a. Fire protection?	_____	_____	_____
b. Police protection?	_____	_____	_____
c. Schools?	_____	_____	_____

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
d. Parks or other recreational facilities?	_____	_____	_____
e. Maintenance of public facilities, including roads?	_____	_____	_____
f. Other governmental services?	_____	_____	_____
15. Energy. Will the proposal result in:			
a. Use of substantial amounts of fuel or energy?	_____	_____	_____
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	_____	_____	_____
16. Utilities. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:			
a. Power or natural gas?	_____	_____	_____
b. Communications systems?	_____	_____	_____
c. Water?	_____	_____	_____
d. Sewer or septic tanks?	_____	_____	_____
e. Storm water drainage?	_____	_____	_____
f. Solid waste and disposal?	_____	_____	_____
17. Human Health. Will the proposal result in:			
a. Creation of any health hazard or potential health hazard (excluding mental health)?	_____	_____	_____
b. Exposure of people to potential health hazards?	_____	_____	_____
18. Aesthetics. Will the proposal result in the obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?	_____	_____	_____
19. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?	_____	_____	_____
20. Cultural Resources.			
a. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archaeological site?	_____	_____	_____

Yes Maybe No

b. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?

c. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?

d. Will the proposal restrict existing religious or sacred uses within the potential impact area?

21. **Mandatory Findings of Significance.**

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)

c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)

d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

III. **Discussion of Environmental Evaluation**

IV. **Determination**

(To be completed by the Lead Agency)

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION WILL BE PREPARED.

I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Date

Signature

For _____

(Note: This is only a suggested form. Public agencies are free to devise their own format for initial studies.)

ANNEX D RECOMMENDED IMPACT CHECKLIST

Natural Environment	Yes	No	Maybe
1. Geology and Soils			
Is the amount of earth moving and excavation appropriate in terms of:			
▪ cost?	---	---	---
▪ erosion potential?	---	---	---
Is the proposed development likely to be safe in terms of:			
▪ landslides and/or	---	---	---
▪ seismic hazards?	---	---	---
2. Drainage			
Does the project meet legal stream buffer requirements?	---	---	---
Is buffer(s) sufficient to address:			
▪ erosion	---	---	---
▪ safety	---	---	---
▪ use of agricultural soils, if any	---	---	---
▪ open space/passive recreation	---	---	---
▪ storm runoff infiltration?	---	---	---
Will the project be safe from flood hazard?	---	---	---
Could it cause/worsen downstream hazard?	---	---	---
3. Vegetation			
Is there a wildfire hazard?	---	---	---
Will there be any important impact on			
▪ plant species and wildlife habitat?	---	---	---
▪ species diversity?	---	---	---

4. Slope & Aspect

- Are views from units protected? ____
- Will views towards the site be affected? ____
- Does the project provide wind protection? ____
- Does the orientation of the project provide:
 - passive solar access? ____
 - passive cooling? ____

Man-Made Environment

5. Land Use

- Does the organization of the site plan provide integration among the main areas/types of units? ____
- Does the site plan provide:
 - easy automobile circulation? ____
 - adequate, convenient parking? ____
 - convenient access to employment centers? ____
 - easy pedestrian access to all services? ____
- Is the plan integrated with adjacent development? ____
- Does the plan fit with future development patterns? ____

6. Infrastructure

- Can the site be provided cost-effectively with:
 - water? ____
 - sanitary sewer? ____
 - storm drains? ____
- Is off-site street capacity and access adequate? ____

7. Services

Are adequate commercial, recreation, day care, and other services provided for on site or likely to be available nearby?

8. Cultural Features

Are there any existing prehistoric sites or artifacts that should be preserved?

Are there any old structures, or other features that could be used or adapted to provide a focus for the development or surrounding community?

9. Special Considerations

Were alternatives considered in selecting and planning site?

Will there be an adverse cumulative effect on:

- ▣ traffic and road capacity?
- ▣ service and infrastructure capacity?
- ▣ any other topic listed above?

Does the site plan draw on solutions already available in historic patterns?
