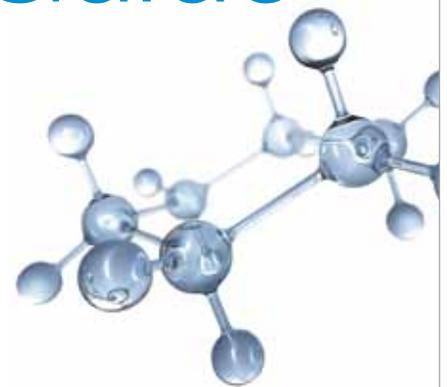


Environmental Aspects Guide



Summary Version
January 1, 2012

ExxonMobil
Taking on the world's toughest energy challenges.™



Table of Contents

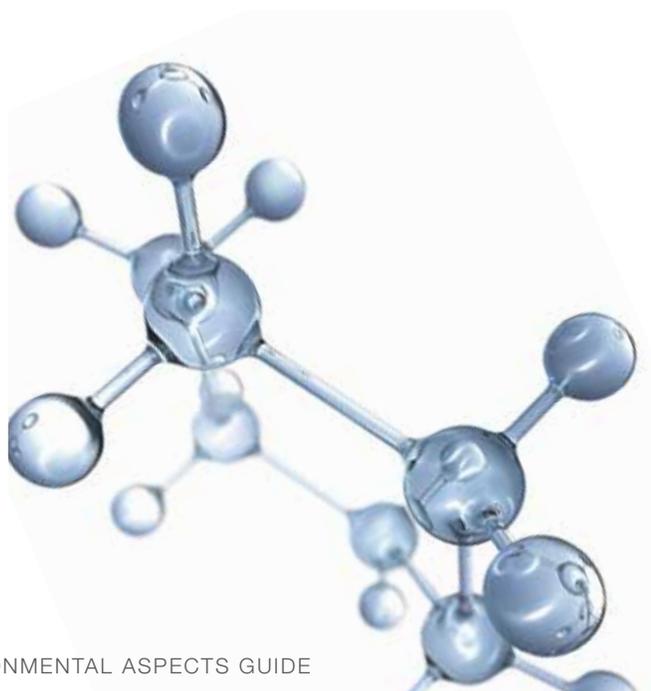
Corporate Separateness.....	1
1. Purpose	2
2. Scope	3
3. Application and Integration into Overall Environmental Management	4
4. Process for Identification and Assessment of Significant Environmental Aspects	6
4.1 STEP-1 – Identify and Characterize Environmental Aspects	7
4.1.1 Aspects Associated with Emissions, Discharges, and Waste Disposal.....	8
4.1.2 Aspects Related to Water Withdrawal and Consumption.....	8
4.1.3 Aspects Related to Other Direct Environmental Resource Demand	9
4.1.4 Aspects with Community or Other Human Welfare Implications.....	9
4.1.5 Other Environmental Aspects	10
4.2 STEP-2 – Characterize Environmental/Social/Regulatory Setting.....	10
4.2.1 Immediate or Direct Setting Characteristics	11
4.2.2 Future or Indirect Setting Considerations	11
4.3 STEP-3 – Identify Project or Operating Alternatives (if applicable).....	12
4.4 STEP-4 – Develop Risk Scenarios (if needed)	13
4.4.1 Environmental Risk Scenario Development.....	13
4.5 STEP-5 – Assess Significance	14
4.5.1 Limitations.....	14
4.5.2 Determination of Consequence Severity	14
4.5.3 Determination of Probability.....	15
4.5.4 Determination of Significance	16
4.5.5 Implications of Risk Assessment	16



Corporate Separateness

In considering this Guide and applying it to actual situations, appropriate care should be taken to respect and maintain the corporate separateness of various ExxonMobil entities. Nothing in this material is intended to override the corporate separateness of local entities. Working relationships discussed in this material do not necessarily represent a reporting connection, but may reflect business function guidance, stewardship, or service contract relationship. Where shareholder consideration by a local entity is contemplated by this material, responsibility for action remains with the local entity.

Exxon Mobil Corporation has numerous affiliates, many with names that include ExxonMobil, Exxon, Esso and Mobil. For convenience and simplicity in this Guide, those terms and terms like corporation, company, our, we, and its are sometimes used as abbreviated references to specific affiliates or affiliate groups. Abbreviated references describing global or regional operational organizations and global or regional business lines are also sometimes used for convenience and simplicity. Similarly, ExxonMobil has business relationships with thousands of customers, suppliers, governments, and others. For convenience and simplicity, words like venture, joint venture, partnership, co-venture, and partner are used to indicate business relationships involving common activities and interests, and those words may not indicate precise legal relationships.



1. Purpose

ExxonMobil is committed to operating in an environmentally responsible manner everywhere we do business. ExxonMobil's Corporate Environment Policy and Protect Tomorrow. Today. expectations serve as the foundation of our efforts, which are guided by a scientific understanding of the environmental impact of our operations as well as by the social and economic needs of the communities in which we operate. This Corporate Guide addresses identification and assessment of significant environmental aspects consistent with the Environment Policy and Protect Tomorrow. Today. The guiding principles underlying the Environment Policy are, namely:

- Deliver superior environmental performance;
- Drive environmental incidents with real impact to zero, through a process of continuous improvement; and
- Achieve industry leadership in focus areas that are valuable to the business.

The Guide is also consistent with ExxonMobil's Operations Integrity Management System (OIMS) requirements and performance expectations, particularly:

- Management commitment and leadership;
- Identification and mitigation of environmental risk;
- Integration of Environmental Business Planning (EBP) into base business; and
- Identification and management of community impacts and concerns.

Aligned with Corporate Policy, Expectations and Systems, the Corporate Environmental Aspects Guide is designed to support the implementation of environmental management expectations of OIMS as applicable to ExxonMobil operations, with special emphasis and linkage with:

- OIMS Element 2: Risk Assessment and Management (and all related Expectations)
- OIMS Element 6: Operations and Maintenance (and all related Expectations)
- ISO 14001 Environmental Management System specifications.

Specifically, the Guide establishes a consistent approach for identifying environmental aspects and for determining which of those aspects may be significant. As used herein, "significant environmental aspects" are those that meet business specific criteria for significant risk, based on the use of the Corporate risk assessment methodology relating to potential environmental impact and the probability that such impact could occur.



2. Scope

Environmental aspects are activities, products, or services that can interact with the environment. For purposes of this guide, the term “activities” will be used broadly to encompass ExxonMobil office and field activities, operations and services. This Guide is focused on:

- Identifying environmental aspects resulting from ExxonMobil activities,
- Understanding the setting in which our activities interact with the environment (natural, regulatory, and social), including how the surrounding environment may change the interaction,
- Assessing potential environmental risks resulting from those aspects, and
- Prioritizing aspects to identify those that may result in significant risk and for which the operation has direct control or influence as it relates to ExxonMobil activities. These aspects are referred to as an assessable unit's significant environmental aspects

The scope of this Guide includes, but is not limited to:

- New facility siting, design, and construction
- Seismic or engineering surveys
- Drilling and workovers
- Operation of existing facilities
- Modification to existing facilities/operations
- Site decommissioning, remediation and reclamation
- Changes in the surrounding environment (external influences)

The term ‘assessable unit’ will be used throughout this document to refer to a site, survey, project, asset, operation, field work area, business unit or other organizational activity, or segment thereof, that is subject to environmental aspect assessment.

Potential environment impacts of any materials in use within an assessable unit are included in unit activities and are within the scope of the assessments described in this Guide. Environmental aspects of products in commerce are not within the scope of this Guide and should be assessed as part of separate review processes for existing and new products.

Follow-up actions are also not within the scope of this Guide. As part of OIMS, ExxonMobil operations are expected to address follow-up actions for significant environmental aspects through other existing management programs.

This Guide is owned by the ExxonMobil Corporate Safety, Security, Health and Environment (SSH&E) Network.



3. Application and Integration into Overall Environmental Management

Environmental Aspects Assessment is a primary mechanism for meeting OIMS environmental risk assessment and management expectations and is a central component of the Environmental Business Planning (EBP) process, as specified by OIMS. Figure 1 illustrates the relationship of key corporate policy, expectations, systems, and guides with environmental aspects assessments and other environmental management programs.

In accordance with OIMS, Assessable Units should identify and assess the environmental aspects of their activities. An environmental aspect reflects both positive and negative outcomes of the interactions between our operations and the environment. For projects and exploration activities, the environmental aspects assessment should be performed early in the planning phase and account for current environmental aspects as well as those that may be encountered during the life of the asset.

Assessable Units should routinely review and update their environmental aspects assessment based on changes in site activities or external influences.

Assessable Units should complete a baseline reassessment on a periodic basis, consistent with the operational complexity and environmental sensitivities. The baseline reassessment should be completed by a multi-disciplinary team including personnel with respective technical, operations, public affairs, risk management and environmental expertise.

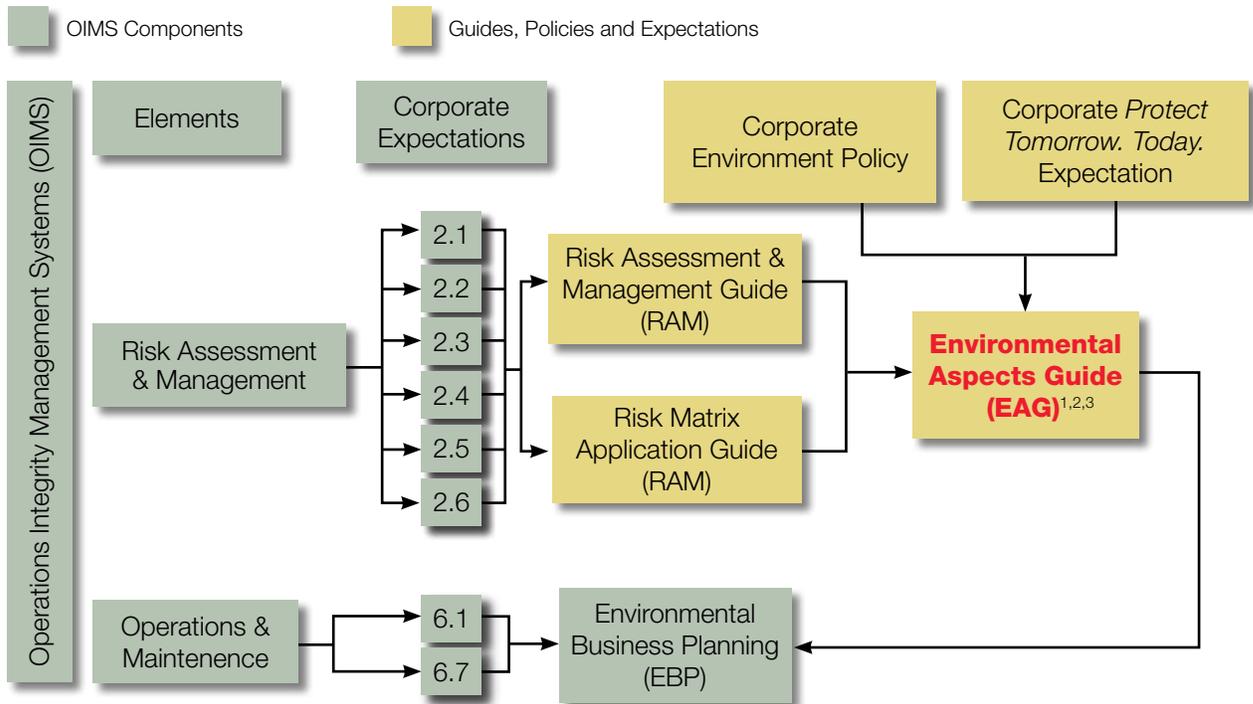
During the planning phase for new activities, environmental aspects and their potential impact(s) should be considered when evaluating alternatives related to timing, siting, routing or technologies. For existing facilities and ongoing operations, environmental aspects identification and assessment is central to identifying EBP focus areas and other environmental performance improvement opportunities.

The evaluation of environmental aspects should be documented and environmental risks stewarded, consistent with OIMS risk assessment and management provisions.



Figure 1. EAG Relationship to Corporate Programs

An Environmental Aspects Assessment (EAA) is an OIMS expectation and is based on the Environmental Aspects Guide (EAG)



¹ EAA is the product of the EAG and is a central component of EBP's which are required by OIMS.

² EAAs are meant to precede/inform various company assessments and plans (ESHIA's, ERA's and EMP's).

³ Acronyms are Environmental Aspects Assessment (EAA), Environmental, Social And Health Impact Assessment (ESHIA), Environmental Risk Assessment (ERA), Environmental Management Plan (EMP).

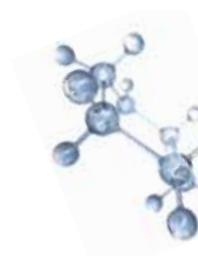


4. Process for Identification and Assessment of Significant Environmental Aspects

As defined earlier, environmental aspects are activities that can interact with the environment. Identification and assessment of aspects is an iterative process. Identifying environmental aspects begins by broadly considering the interaction between our activities and the environment (including changes to the surrounding environment) and the potential impacts of the aspect – direct and indirect. After aspects are defined, it is important to gain an understanding of the surrounding environment and how applicable external events may influence specific aspects. Where applicable, alternative design or operating alternatives should be considered. Finally, the significance of each aspect is evaluated, broadly considering a range of potential consequences.

It is important to note that while broad consideration is given to aspects and potential consequences of an aspect, this does not imply nor require quantification or documentation of all aspects or all potential consequences. Personnel are expected to exercise good judgment to focus the analysis on the aspects most likely to result in significant risks. Management is expected to confirm that the personnel conducting these evaluations are qualified to make the judgments described. Ongoing monitoring and assessment provide opportunities to confirm that potentially significant aspects have not been overlooked. The following sections provide a detailed description of each step in the process.

Identification and Assessment of Aspects is an Iterative Process



4.1 STEP-1 – Identify and Characterize Environmental Aspects

This section details guidance for identifying and characterizing environmental aspects. In this Guide, an environmental aspect is an activity that can interact with the environment. Such an activity may be direct, in which the activity interacts with the environment, or indirect, in which the activity causes follow-on activities by others, or triggers a series of subsequent events, which in turn may result in environmental impacts. Examples of indirect environmental aspects include activities of suppliers and contractors and our interactions with people, communities and governments that trigger their additional interactions with the environment.

The identification of environmental aspects is in part a specific case of identification of hazards in a more general (not environment-specific) risk assessment. Some aspects may also represent benefits rather than hazards.

The identification/characterization process described in this section is iterative. If additional aspects are identified after any later step (see Sections 4.2 through 4.5), Step 1 ((described in Section 4.1) and later steps should be conducted for these additional aspects. All identification and characterization of aspects should consider the entire life span of the activity being assessed.

The remainder of this section examines the identification and characterization of environmental aspects in more detail.



**Protect Tomorrow.
Today.**



4.1.1 Aspects Associated with Emissions, Discharges, and Waste Disposal

Emitting, discharging, producing and disposing of waste are environmental aspects that can result from all types of facilities (vessels, platforms, plants etc.) and all types of operations (such as start-up, shut-down, continuous, maintenance, regeneration, product grade changes, unsteady and/or upset operations). These aspects may not always be obvious, but may be as common as dust that may be present because of our activities.

There are numerous elements of characterization for these aspects and many or all may be useful for an accurate assessment of potentially significant environmental consequences. Most elements of characterization may be qualitative, but quantification to the degree feasible is desirable for potentially significant aspects. Emissions, discharges and waste management can be characterized by source, type, composition, amount, duration, and intensity, and by persistence, toxicity, bioaccumulation potential, degradation, and transport and fate considerations for its chemical components.

For purposes of indirect risk assessment or consideration of Step 3 (Alternatives), it will be important to consider the possible alternative or community value of emitted, discharged, or disposed substances (such as value of wastewater for use or recycle, value of vented gases as fuels, or value of disposed materials for reuse or as aggregate, fill, cover, or biofuel feedstock, etc.).

Aspects that are clearly significant may not need to be quantitatively characterized. In some cases however, the need for characterization may be set by what is required to properly assess risk and/or mitigation alternatives. For example, to assess or mitigate associated consequences from a discharge, an area or volume of potential impact typically would be required.

4.1.2 Aspects Related to Water Withdrawal and Consumption

Water is a vital resource and environmental aspects related to water withdrawal, use and consumption may have internal ExxonMobil and external implications, both human and ecological. Both fresh and non-fresh water sources should be considered.

Examples of water sources include:

- Natural sources including but not limited to rivers, lakes, ponds, wetlands, seas, oceans, estuaries, lagoons, aquifers (unconfined and confined), storm water (captured runoff), rainfall, etc.
- Man-made and/or indirect sources including ditches, detention/retention ponds, purchased (public or private), industrial transfer (wastewater), produced water, etc.

Water use should be characterized to the extent necessary to allow an accurate assessment of potentially significant environmental consequences over the life of an operation or activity.

Data and information considerations include, but are not limited to:

- Data on the total quantity and general quality withdrawn (current and planned future) from each source
- Internal uses of water across activities
- Discharge quantities and qualities to surface or subsurface water body
- General understanding of future quantities and/or qualities needed (such as based on known future expansions, operational changes, etc.)

The level of detail in the characterization of water withdrawal and consumption should consider:

- Source type
- Withdrawals that compete with other users
- Potential over withdrawals from limited or restricted sources.





4.1.3 Aspects Related to Other Direct Environmental Resource Demand

Water withdrawals constitute a direct demand on an environmental resource. Other important aspects with direct environmental resource demand (current and future) include the following:

- Use of power, land, workforce, materials and goods
- Activities that remove environmental resources from the environment (e.g., water, fuels, land, food, soil, timber, etc.)
- Dependence on or alteration of ecosystem services (human benefits provided by the natural environment,

such as erosion prevention, flood control, water purification, pharmaceuticals, recreation, traditional lifestyles, etc.)

Activities having a direct environmental resource demand should be characterized by evaluating their scope/scale/size, duration, and intensity. Consider resource demand related to operations, construction, and/or traffic.

4.1.4 Aspects with Community or Other Human Welfare Implications

Some aspects can be significant primarily due to potential effects on the local community. Environmental aspects with local community implications can include but are not limited to:

- Activities with potential community health implications (such as those introducing dust, soot, and/or contaminants into the environment; or potentially having adverse effects on water or food supplies; or potentially promoting transmission of disease)
- Activities potentially creating a nuisance (such as odors, dust, noise, light, vibration, traffic, and/or visual impact on the landscape)
- Changes in surface use, including but not limited to topography, vegetation and man-made impediments

to surface flow

- Activities such as seismic surveys, projects/upgrades or emergency response that could disrupt or limit access to public infrastructure, supplies, or services (e.g., drinking water/road use, energy/waste services, land use etc.)
- Activities potentially affecting cultural resources such as archeological, recreational or religious sites.

Aspects impacting the local environment/community should be characterized by scope/scale, duration, intensity, and frequency.



4.1.5 Other Environmental Aspects

A number of other activities may be considered as candidates for environmental aspects characterization, including the following:

- Addition or removal of thermal energy into air or water: such as waste heat, cooled discharges, flaring (potential to drive away wildlife and alter dormancy patterns and microclimates)
- Activities emitting light, including illumination and flaring (potential to disrupt wildlife, alter nocturnal behaviors, etc.)
- Activities generating other forms of energy (such as sound, electromagnetic fields, etc.) in the marine environment, or in aquatic or terrestrial systems (potential to drive away wildlife, alter migration patterns, impair natural range or behaviors)
- Human activity and pedestrian and vehicle traffic (potential to drive away wildlife, create barriers to movement and migration, destroy vegetation, erode soils, generate dust, use of commercial aviation)
- Activities with potential for introduction of foreign species (such as via ballast water, fouled vessel hulls, earth-moving equipment, revegetation materials, shipments of materials and supplies, etc.) including translocation of species, or induced access which can do this as well
- Other indirect aspects resulting from our direct activities (such as, illegal logging; actions (aspects) of resettled, encroaching, or in-migrated populations; poaching, etc.)

Each aspect should be characterized by scope/volume/ scale, duration, frequency, and intensity.

4.2 STEP-2 – Characterize Environmental/ Social/Regulatory Setting

The environmental setting in which an aspect occurs determines what living systems and other natural resources may be affected. The social setting determines the proximity of people and their relationships with the natural environment. The regulatory setting determines controls on our interactions with the natural and social environment. The combined environmental, social and regulatory context is key to assessing environmental, public, and community health risks associated with our environmental aspects.

The environmental, social, and regulatory context has two components:

- The immediate, current surroundings or sphere of direct influence
- The prospective, anticipated future surroundings or indirect sphere of influence.

Immediate or direct setting characteristics may include the state of the natural environment (for example, climate, living things, physical/chemical conditions, ecosystem functions or services, etc.), social conditions (economy, health, employment, etc.), and regulatory requirements, including community and/or government and/or corporate expectations. Prospective or indirect setting characteristics are external to the current immediate surroundings but may influence the probable future significance of some aspects. Examples may include anticipated future conditions (for example, changing

climate or infrastructure development), applicable precedents, industry practices and/or standards, potential or on-going studies, and national and/or international organizations'/governments' positions and/or policies. Additionally, environmental and/or social conditions outside the direct setting can be indirectly influenced by our activities, or similarly, affect conditions in the direct setting. Examples may include disruption to foodweb dynamics; reproductive failure in a species in an adjacent area; and demands placed on surrounding areas from encroaching human populations.

When characterizing the environmental, social, and regulatory context it is typical to start with the current immediate setting and build out to the more prospective or indirect setting. It is recognized that this process is often iterative.

It is important to individually assess the environmental, social, and regulatory context for each ExxonMobil assessable unit, as specific conditions (and/or their magnitude of influence) differ from site-to-site and over time. For example, similar activities may have a greater impact in one location than another due to local community values, the nature of the ecosystem, or presence of non-ExxonMobil activities. Where other parties are significant contributors to a potential impact, part of characterizing the setting should include the characterization of their relative contributions.



4.2.1 Immediate or Direct Setting Characteristics

Some of the specific characteristics that may be considered when assessing the environmental, social, and regulatory context include:

- Environmental processes (affecting migration, chemical fate, and zones of influence of environmental aspects), such as wind, water flows, and foodweb processes.
- Environmental conditions (character, status and variability of the natural environment), such as ecosystem health and services, biodiversity, and pre-existing damage and stressors
- Social and economic conditions, such as community health and dependence on natural resources
- Existing and evolving laws, regulations, permits, international conventions, and other legal obligations
- Voluntary Commitments (for example, Responsible Care).
- ExxonMobil Corporate and/or Affiliate environmental objectives and programs, environmental standards, practices, and experience.
- Expectations of governments, lender institutions, community, non-governmental organizations (NGOs), and local media.
- Industry standards
- Academic studies (both published and known working projects)



Additionally, geospatial data can be helpful in identifying relationships between existing or planned activities and the surrounding environment, particularly proximity to sensitive areas or resources. Proximity information will assist in the identification of credible risk scenarios and the determination of risk. Geospatial imagery data are also helpful in understanding changes in environmental conditions over time. This can be valuable for identifying both beneficial and negative impacts of aspects.

4.2.2 Future or Indirect Setting Considerations

Conditions existing or emerging in other locations or jurisdictions may be good indicators of the significance of certain aspects. This may also be true for specific or broadly applied criteria set by influential organizations, such as the World Bank. If such conditions or criteria indicate a potentially significant change in how an aspect will be viewed, it is appropriate to consider them. They may include:

- Requirements or guidelines of lending institutions not involved in financing the current activity (for example, World Bank or IFC Guidelines)
- Laws and regulations of neighboring countries or other countries of particular historical, economic, or political significance, or with a similar environmental or social context to the country of interest
- International laws, treaties, conventions applicable to the current activity in other jurisdictions
- Current and developing science (for example, adverse-effect thresholds, new findings of potential sensitivity, threat or endangerment)
- Significant environmental, social or regulatory incidents in other countries or regions with activities/operations similar to those in question (for example, significant oil spills and associated ramifications)
- Management of similar environmental aspects within a similar context (for example, use of control technologies, good practices, and in-country precedents)
- International NGO and media expectations





4.3 STEP-3 – Identify Project or Operating Alternatives (if applicable)

When assessing environmental aspects for new activities, a remaining step prior to risk assessment is the identification of any project or operating alternatives to which the risk assessment should be applied. Project or operating alternatives are a discrete set of possible choices for attaining business goals. Risk assessing alternatives with respect to environmental aspects can assist in selecting the alternative that best meets business goals.

International standards for environmental assessment require early consideration of alternatives, in order to obviate the consideration of higher-risk undertakings for which lower-risk alternatives exist. Moreover, alternatives should be examined early and the result used to identify preferred courses of action rather than as risk mitigation after a decision is already made. Note: Project and operating alternatives are distinct from mitigation actions which may be taken to lower risk of a particular alternative once chosen.

Alternatives will generally include:

- Technology and practices in common use
- Step out technology and practices
- Routing/siting options
- Timing including length of time
- Choices among equipment and materials, such as choice of geophysical tools, vessel types, operating fluids or fuels
- “No action” (not undertaking a project/activity)

Alternatives selected for risk assessment need not be an exhaustive set, but should span the range of options in regards to design, engineering, siting, routing, operating, equipment/tools, vessels and processes. Each should be screened prior to risk assessment to confirm it is:

- Scientifically sound
- Economically and technically feasible
- Consistent with balanced business and environmental/social needs

For existing facilities/operations the mitigation of significant aspects through changes in technology or operating practices should be addressed by the facility/operation’s environmental business planning process.



4.4 STEP-4 – Develop Risk Scenarios (if needed)



Environmental aspects assessment is a risk-based process. At ExxonMobil, scenario-based risk assessment is recommended as the primary methodology for risk assessment. This method entails the development of at least one credible sequence of events or conditions leading to a potential consequence for each aspect assessed. This sequence of events is called a “risk scenario.” This

scenario forms the foundation for the interpretation of consequence severity and probability that will determine risk categorization and aspect significance (see Step 5).

As for any risk assessment, the development of a complete yet concise set of risk scenarios depends on the adequacy of the data developed in Steps 1 – 3, above, concerning the types of aspects present, their magnitude, and the settings in which they occur. For environmental aspect assessment, risk scenarios will focus on interactions between aspects (activities) and environmental receptor/s.

It should be noted that, in some cases, the significance of an environmental aspect may be driven by the “Safety/Health,” “Public Impact,” or “Financial Impact” rather than environmental consequences. These risks should be assessed separately and, if higher than the environmental risk, will drive the significance assessment for the aspect.

4.4.1 Environmental Risk Scenario Development

The first step in developing a credible risk scenario is to identify consequences that could reasonably be expected to result from an environmental aspect. For environmental consequences, particular consideration should be given to known sensitivities such as

- Rare, threatened, or endangered species (fauna or flora)
- Uniquely bio-diverse and threatened or vulnerable ecosystems
- Overdrawn or critical ecosystem services, such as those identified through World Resources Institute’s Corporate Ecosystem Services Review or the IPIECA/OGP Biodiversity and Ecosystem Services checklists
- Important biological/environmental features such as fisheries, wetlands, water recharge areas, etc.

As previously noted, scenarios with non-environmental consequences (health/safety, public, or financial) may also be identified during the scenario development process.

In most cases, only a limited number of scenarios need to be considered. There is no need to include many similar consequence scenarios and aspects for which consequences are inconsequential or already addressed in a more credible scenario.

Scenario development should also consider that worst-case scenarios may not always represent the highest risks (or meet the criterion of credibility) if their associated probabilities are very low.

The identification of potential consequences should recognize the fate and transport of released substances. For instance, substances released to air may eventually transfer to water, those released to water may eventually partition to soil, air or living tissue, those released to soil may percolate to groundwater and eventually to surface water, etc.

Consequences can also result from secondary effects of an aspect, such as stream turbidity resulting from earthwork that has created erosion and vegetation loss, or hunting pressures on wildlife resulting from creation of a new road or pipeline right-of-way that has facilitated greater human access to previously remote areas.

To complete scenario development, ensure that the failures, events, or conditions necessary to produce the consequences of each scenario are defined and documented. These will be key in the later evaluation of scenario likelihood, especially for more complex scenarios, such as those resulting from secondary or indirect effects of environmental aspects. Only aspects appearing in credible risk scenarios will be further assessed (see Step 5).



4.5 STEP-5 – Assess Significance

In ISO 14001, significant environmental aspects are defined as those that have or can have significant environmental impacts. Within ExxonMobil, significant impacts are defined as those entailing significant safety, security, health, or environmental risk, with risk assessed using the corporate assessment methodology and any additional business function-specific guidance. How the corporate methodology is applied will depend on the risk scenario and the nature of the risk. For some scenarios, full application of the corporate methodology will be possible and necessary; for others, the risk assessment will be more qualitative and used to screen aspects into significant aspects and less significant aspects. A full quantitative risk assessment is often unnecessary and OIMS requirements should not be construed to require such assessment.

Structured risk assessment is a tool that may be used by an assessable unit to evaluate significance. This approach entails evaluating the risk of an environmental

aspect for each credible scenario (see Section 4.4) based on a determination of consequence severity, combined with an estimate of probability or likelihood that the consequences could occur. In the Corporate Risk Assessment and Management process, health/safety, environmental, public, and financial consequences are all considered in evaluating placement on the Risk Matrix. The Environmental Aspects Guide, addressing environmental aspect risk assessment, focuses primarily on environmental consequences, but as previously discussed, public, health, safety or financial impact could affect the determination of risk. Once risk is determined, significance of the risk and Aspect is assessed based on levels "associated with the position on the risk matrix."

Note: Although a structured risk assessment may not be needed to assess significance, it may be required to inform the mitigation analysis, to support communication with management, or other objectives.

4.5.1 Limitations

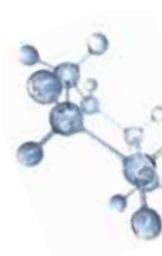
The above discussions of comparing risk by plotting scenario consequence and likelihood apply only to single-scenario risks. Chronic and aggregate or cumulative risks, common in the assessment of

environmental risk, can be screened by this method, but any position on the matrix may not be comparable to similarly-located single-scenario risks.

4.5.2 Determination of Consequence Severity

Environmental consequences are judged by the degree of adverse effects on receptors, e.g. flora, fauna, habitat, groundwater, etc. These effects may be due to spills, releases, routine emissions, clearing, earth moving, or other events or conditions that may affect the environment or its components.

Consequences can be evaluated in terms of the degree of the effects and the sensitivity of the environment. Consequence severity can be interpreted as a function of three effects dimensions (scale, duration, and intensity) and three environmental sensitivity dimensions (irreplaceability, vulnerability, and influence). The degree of each of the dimensions is evaluated, combined, and interpreted to give an overall consequence severity. Further guidance and examples are available in the full Environmental Aspects Guide.



4.5.3 Determination of Probability

Once the most severe consequences are identified, the probability of those consequences being realized should be assessed. This is done by assessing the probability for each failure, event, or condition necessary to produce the consequences as documented in the risk scenario or associated event tree analysis. For example, consider an environmental scenario involving the continuous discharge of a substance to a river resulting in a given consequence to a fish species. A scenario leading to that consequence might require a low-flow condition in the river and large numbers of a species of concern being present for a critical time period within the dilution zone. A probability can be determined for each of the events making up the consequence scenario. The

probability of the discharge is 1.0 since the substance is continuously discharged. However, the probability should be estimated for the low-flow condition and the presence of a large number of the fish of concern in the exposure area. These probabilities can then be combined (as the product of individual probabilities) to estimate the likelihood of the overall consequence scenario.

The probability of lower severity consequences should also be evaluated to determine whether any have sufficiently higher probability to result in a higher risk.

Corporate Risk Matrix



4.5.4 Determination of Significance

Risk determines significance and is defined as consequence times probability. The combination of consequence severity and probability of occurrence determines the position on the Risk Matrix. Positions closest to the upper left-hand side of the Risk Matrix represent the highest risk and, thus, are of higher relative significance. Assessable Units may provide specific guidance on which areas of the Risk Matrix are significant in the context of their particular business and operating situations.

Environmental aspects may also result in consequences beyond the environmental or ecosystem impacts. For example, heavy dust emissions could present safety risks, releases of wastes to potable ground water could present community health risks, a project in a wilderness area could create public (media/reputation) risk and the need to respond to a spill could create financial risk, all in addition to environmental or ecosystem risks. Other public, health, safety, and financial risks should be assessed separately and, when higher than the environmental risk, will drive the significance assessment for the aspect.

4.5.5 Implications of Risk Assessment

Processes for managing actions to mitigate the consequences or probability of a significant environmental aspect fall outside the scope of this guide. Mitigation of significant aspects can include design changes, facility changes, operating changes, or all of the above.

Aspects not found to be significant typically require no special action since routine risk management will address these. Environmental aspects are routinely reviewed and re-assessed as necessary, i.e., internal or external changes have likely significantly altered the associated level of risk

