

**Представительство Международной организации
МСОП – Международный Союз Охраны Природы
(Швейцария)**



Столярный переулок, д. 3, строение 3
Москва, 123022, Россия
Тел: + (7-495) 609-33-99
Факс: + (7-495) 609-34-11
Эл.почта: Vladimir.Moshkalo@iucn.org
Сайт: www.iucn.ru

**Отдел по связям с общественностью
компании «ЭНЛ»**

Факс 8 (4242) 67 73 69

Исх. №.: 01/1-23

Москва, 04 мая 2008

**Относительно общественных обсуждений
проекта Сахалин-1**

Уважаемые дамы и господа!

В соответствии с проведением общественных обсуждений материалов по оценке воздействия на окружающую среду проекта строительства «Промысловый трубопровод Буровая Площадка Одопту 2 - Береговой Комплекс Подготовки Чайво. Переход через залив Пильтун. Уточнения к проекту. Проект «Сахалин-1». Стадия 1», направляем Вам комментарии Независимой Консультативной группы по западно-тихоокеанским серым китам (WGWAP), созданной под эгидой Международного союза охраны природы (IUCN).

Если Вам необходим перевод на русский язык выдержек из докладов о совещаниях Независимой Консультативной группы по западно-тихоокеанским серым китам, просим сообщить по электронной почте [Vladimir.Moshkalo@iucn.ru/](mailto:Vladimir.Moshkalo@iucn.ru)

Приложения:

1. Комментарии Независимой Консультативной группы по западно-тихоокеанским серым китам (WGWAP) русском языке, в 1 экз. на 2 л.
2. Комментарии Независимой Консультативной группы по западно-тихоокеанским серым китам (WGWAP) на английском языке, в 1 экз. на 2 л.
3. Выдержки из докладов о совещаниях Независимой Консультативной группы по западно-тихоокеанским серым китам на английском языке, в 1 экз. на 8 л.

С уважением,

В.Мошкало
Директор

**World Headquarters
International Union for Conservation of Nature**

IUCN
Rue Mauverney 28
1196 Gland
Switzerland

Tel +41 22 999 0000
Fax +41 22 999 0002
mail@iucn.org
www.iucn.org

IUCN Regional Office for Europe

Boulevard Louis Schmidt, 64,
1040 Brussels
Belgium

Tel:+ (32-2) 732 82 99
Fax:+ (32-2) 732 94 99
e-mail: Europe@iucn.org



3, building 3, Stolyarny pereulok,
Moscow, 123022, Russia
Tel: + (7-495) 609-33-99
Fax: + (7-495) 609-34-11
E-mail: info@iucn.ru
Web: www.iucn.ru

**Section for Public Relations of Exxon
Neftegaz Ltd.**

Fax: 8 (4242) 67 73 69

Our ref. №: 01/1-23

Moscow, 04 May 2008

**Regarding Public Hearing
of Sakhalin-1 Project**

Dear Sir/Madame!

In accordance with organized public discussion of the materials of Environmental Impact Assessment of the construction project "Production Pipeline Platform Odoptu 2 – Coastal Preparation Complex Chaivo. Passage through Piltun bay. Clarifications to the project. Project "Sakhalin-1". Stage 1", herewith you will find attached the Comments by the Western Gray Whale Advisory Panel (WGWAP) Convened by the International Union for Conservation of Nature (IUCN).

If you would require Russian translation of the attached Excerpts from reports by the Western Gray Whale Advisory Panel, please let us know via e-mail Vladimir.Moshkalo@iucn.ru.

Appendices:

1. Comments by the Western Gray Whale Advisory Panel (WGWAP) regarding plans to construct an oil pipeline across Piltun Lagoon, Sakhalin Island, and to construct an ice bridge across the Lagoon in order to support pipeline installation in Russian, in 1 copy on 2 sheets.
2. Comments by the Western Gray Whale Advisory Panel (WGWAP) regarding plans to construct an oil pipeline across Piltun Lagoon, Sakhalin Island, and to construct an ice bridge across the Lagoon in order to support pipeline installation in Russian, in 1 copy on 2 sheets.
3. Excerpts from reports by the Western Gray Whale Advisory Panel in English, in 1 copy on 2 sheets.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'V. Moshkalo', is written over a light blue circular stamp.

Vladimir Moshkalo
Director

**World Headquarters
International Union for Conservation of Nature**

IUCN
Rue Mauverney 28
1196 Gland
Switzerland

Tel +41 22 999 0000
Fax +41 22 999 0002
mail@iucn.org
www.iucn.org

IUCN Regional Office for Europe

Boulevard Louis Schmidt, 64,
1040 Brussels
Belgium

Tel:+ (32-2) 732 82 99
Fax:+ (32-2) 732 94 99
e-mail: Europe@iucn.org

Комментарии Независимой Консультативной группы по западно-тихоокеанским серым китам (WGWAP) относительно планов строительства трубопровода через залив Пильтун и строительства ледяного моста через залив в целях содействия прокладки трубопровода.

Нам было сообщено, что компания «Эксон Нефтегаз Лимитед» (ЭНЛ) попросила представить комментарии к проекту строительства нефтепровода через залив Пильтун, остров Сахалин, Российская Федерация, являющегося частью проекта Сахалин-1, направленного на разработку нефтегазоносных месторождений. Настоящим мы отвечаем относительно комментария, что строительство и эксплуатация такого нефтепровода не создаст потенциальную угрозу местообитанию критически угрожаемой корейско-охотской («западной») популяции серого кита, которая насчитывает около 130 животных.

Коротко о нас. Начиная с 2004 г. Международный союз охраны природы (IUCN) созывал несколько консультативных групп, включающих независимых ученых специализирующихся на изучении западных серых китов и их местообитаний. Настоящая группа, известная как Независимая Консультативная группа по западно-тихоокеанским серым китам (WGWAP), состоит из 11 независимых ученых из 6 стран мира (Россия, Канада, Германия, Ирландия, Великобритания и США). Группа была создана под эгидой IUCN для обеспечения методического руководства деятельности нефтегазовым компаниям в целях минимизации рисков для серых китов и их местообитаний на северо-восточном шельфе о. Сахалин. Более подробную информацию о данной инициативе IUCN можно найти на странице www.iucn.org/themes/marine/sakhalin/index.htm.

В настоящее время фокус нашей работы ограничен проектом разработки морских месторождений, известном как Сахалин-2, оператором которого является акционерная компания Сахалин Энерджи Инвестмент Лимитед (СЭИК). Площадка проекта Сахалин-2 расположена в непосредственной близости от нагульных площадей западных серых китов. Другие активные проекты разработки морских месторождений, в особенности проект Сахалин-1, расположены вблизи прибрежной нагульной площади (Пильтун), используемой кормящими самками с телятами. Несмотря на то, что компания ЭНЛ получала приглашения от IUCN о сотрудничестве, ни один представитель компании не принял участие ни в работе WGWAP, ни в предыдущих заседаниях консультационных групп.

Нами был рассмотрен документ, распространенный компанией ЭНЛ (в связи с процессом общественных обсуждений 2-го этапа проекта Сахалин-1, апрель 2008), который предлагает что наличие технических данных опровергающих значение органических и минеральных материалов поступающих из залива Пильтун в прибрежный нагульный ареал серых китов. Мы не можем согласиться с эти утверждением в связи с тем, что до настоящего времени не было произведено соответствующих научных исследований, опровергающих значение таких потенциальных выбросов. Более того, другие существующие океанические процессы, которые увеличивают продуктивность бентоса на северо-восточном шельфе Сахалина, как описано в документе, не смогут нейтрализовать потенциальные воздействия поступлений из залива в нагульные территории китов.

WGWAR и ее предшественники неоднократно выражали озабоченность в связи с тем, что залив Пильтун может играть основную роль в продуктивности нагульных территорий западных серых китов и залив, в следствие этого, должен являться объектом мониторинга и быть эффективно защищен от беспокойства. Эта озабоченность была выражена в отчетах о совещаниях WGWAR, имеющихся в публичном доступе на веб-странице инициативы. В прилагаемом документе приведены выдержки из отчетов о совещаниях WGWAR.

Подводя итоги, можно заключить, что в результате приливно-отливной флуктуации и циркуляции воды в устьях рек, вытекающие воды из залива Пильтун попадают в океан в районе южной оконечности прибрежной нагульной зоны (Пильтун), используемой преимущественно самками и телятами. Более детальная техническая литература, посвященная экологии морских лагун в различных точках земного шара, говорит о потенциальной возможности влияние потоков из лагуны на продуктивность бентоса. Научная литература предполагает, что потоки, вытекающие из залива Пильтун, могут оказать влияние на шельфовые нагульные территории серых китов в одной из следующих форм:

1. Добавление значительного количества органических частиц, происходящих из наземных или водных процессов в водосборе залива Пильтун, во взвешенном или растворенном состоянии;
2. Добавление значительного количества органических частиц во взвешенном или растворенном состоянии, в результате производства фитопланктона в заливе Пильтун;
3. Добавление значительного количества живого фитопланктона, производимого в заливе;
4. Добавление значительного количества неорганических питательных веществ, таких как нитраты и фосфаты, которые являются известными стимуляторами первичной продуктивности прибрежных океанических вод, происходящими из процессов органического разложения в лагуне.

В заключении, считаем преждевременным вывод о том, что залив Пильтун не является важным для выживания западных серых китов. Более того, хотя нашим основным объектом изучения являются киты, мы также признаем значение флористического разнообразия залива и ее роль в поддержании популяций рыб, птиц и котиков, которые могут быть подвержены негативному воздействию вследствие предполагаемого строительства трубопровода.

Принимая во внимание угрожаемое состояние популяции западных серых китов, необходимо использовать подход, основанный на принципе "осторожности". Мы предлагаем, что было бы предпочтительно разработать альтернативный подход, включая изменение места прокладки трубопровода, чтобы исключить потенциальный разрыв ключевых процессов биологической продуктивности внутри залива. Конечно, любой подобный альтернативный план должен быть объектом тщательной научной оценки в целях минимизации негативного воздействия на популяцию западных серых китов и снижения ущерба локальной экосистеме в целом.

Comments by the Western Gray Whale Advisory Panel (WGWAP) regarding plans to construct an oil pipeline across Piltun Lagoon, Sakhalin Island, and to construct an ice bridge across the Lagoon in order to support pipeline installation.

It has been brought to our attention that comments are requested on the proposal by Exxon Neftegas Ltd. (ENL) to develop an oil pipeline across Piltun Lagoon, Sakhalin Island, Russian Federation, in support of development activities for Sakhalin I, an oil and gas development project. We are writing in response to comments that the construction and operation of such a pipeline would not pose a potential threat to the habitat of the critically endangered Korean-Okhotsk (“western”) population of gray whales that numbers only about 130 animals.

To introduce ourselves, since 2004 the International Union for Conservation of Nature (IUCN) has convened a series of panels of independent scientists with expertise on western gray whales and their habitat. The present Panel, known as the Western Gray Whale Advisory Panel (WGWAP) and consisting of eleven independent scientists from six countries (Russian Federation, Canada, Germany, Ireland, UK and USA), has been convened by IUCN to provide guidance to the oil and gas industry in order to minimize risks to gray whales and their habitat on the northeastern Sakhalin shelf. Information on this IUCN initiative can be found at www.iucn.org/themes/marine/sakhalin/index.htm.

At present, the focus of our work is limited to the offshore development project known as Sakhalin II operated by the Sakhalin Energy Investment Company Ltd. (SEIC). Sakhalin II is near to the principal feeding areas of western gray whales. Other offshore development projects, especially Sakhalin I, are active in the region, and most importantly are adjacent to the near-shore (Piltun) feeding area used by nursing females and their calves. Although it has received invitations from IUCN to co-operate, ENL has not participated in the WGWAP or previous panel processes.

We have reviewed a document recently circulated by ENL (in relation to its public consultation period on Stage 2 of the Sakhalin I project, April 2008) that suggests the existence of technical data disproving the significance of organic or inorganic subsidies from Piltun Lagoon to nearshore feeding areas for the whales. We cannot agree with this conclusion since, to date, no studies have been undertaken that could disprove the significance of such potential subsidies. Moreover, the existence of other ocean processes that enhance benthic productivity on the northeastern Sakhalin shelf, as outlined in the document, would not negate the potential contributions by Lagoon-based subsidies to the feeding areas used by the whales.

The WGWAP and its predecessor panels have repeatedly expressed concern that Piltun Lagoon may be crucial to the productivity of feeding areas for western gray whales, and that the Lagoon must, as a consequence, be carefully monitored and effectively protected from disturbance. This concern has been noted in publicly available meeting reports, also available on the WGWAP website. The appended document provides the relevant excerpts from those reports.

To summarize, as a result of tidal fluctuation and estuarine circulation, effluent waters from Piltun Lagoon enter the ocean near the southern end of the near-shore (Piltun) feeding area used preferentially by females and calves. A broadly based technical literature on coastal marine lagoon ecology in locations around the world indicates the potential for subsidies to benthic productivity from lagoon outflow. The scientific literature implies that subsidies originating from the Piltun Lagoon to whale feeding areas on the Sakhalin Shelf could take one of the following forms:

1. Addition of significant quantities of organic detritus in particulate or dissolved form, originating from aquatic or terrestrial processes in the Lagoon's watershed;
2. Addition of significant quantities of organic detritus in particulate or dissolved form, resulting from phytoplankton production occurring in the Lagoon;
3. Addition of significant quantities of living phytoplankton produced in the Lagoon;
4. Addition of significant quantities of inorganic nutrients such as nitrate or phosphate that are known to stimulate primary productivity in nearshore ocean waters, resulting from organic decompositional processes within the Lagoon.

In short, it is premature to conclude that Piltun Lagoon is unimportant to the survival of western gray whales. Further, though our primary focus is on the whales, we also recognize the value of the Lagoon's botanical diversity and its role in supporting populations of fish, birds and seals, all of which stand to be affected by the proposed pipeline.

Given the precarious state of the western gray whale population, a precautionary approach is essential. We suggest that it would be preferable to develop an alternative option, such as rerouting of the pipeline, to eliminate the potential for disruption of key processes of biological productivity within the Lagoon. Of course, it would be essential for any such alternative plan to be subjected to thorough scientific evaluation in order to minimise disturbance to western gray whales and damage to the wider local ecosystem.

Appendix: Excerpts from reports by the Western Gray Whale Advisory Panel and predecessor panels regarding the potential significance of Piltun Lagoon to the productivity of gray whale feeding areas near offshore development projects “Sakhalin I” (operated by Exxon Neftegas Ltd. [ENL]) and “Sakhalin II” (operated by the Sakhalin Energy Investment Company [SEIC]):

1. Report of the Independent Scientific Review Panel (ISRP) on the Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and related biodiversity. February 2005. www.iucn.org/themes/marine/sakhalin/isrp/

A. From the Executive Summary:

Section 3.3 (“Oil Exposure”): “A spill or release of oil in or near Piltun Lagoon also is a major concern because it could alter the ecological processes that maintain the Piltun (nearshore) foraging area where female gray whales nurse and wean their calves. This concern applies to both Sakhalin II and Sakhalin I, which includes plans for a pipeline crossing of the lagoon itself.”

Section 3.4 (“Physical Disturbance”): “In the present context, any disruption of exchange mechanisms between Piltun Lagoon and the Piltun (nearshore) foraging area is a special concern.”

Section 4 (“Information gaps and essential monitoring”): “With regard to the potential effects of noise, collisions, oil and gas spills and habitat destruction, research and monitoring are needed to characterize both the risk factors and the dependent variables (i.e. whale, prey or habitat response). Due to uncertainty regarding potential effects and their detection, monitoring and research efforts will require careful and rigorous design to ensure that there is a high probability of detecting changes in demography that will have a significant effect on the recovery of the population. The Panel’s review identified the following general areas for future research, including some that will require annual monitoring and some that will depend on circumstances (e.g. in the event of a spill):”

[The list includes the following points]:

“• Investigation of the ocean dynamics (currents, tides, winds) in the vicinity of Sakhalin II, the Piltun (nearshore) and offshore feeding habitats, and the Piltun Lagoon; *inter alia* this will allow for better modelling of the dynamics of oil spills and improved response strategies.

• Investigation of the ecology of Piltun Lagoon and the nearshore foraging area, and the links between them; *inter alia* this will provide a more secure basis for evaluating the likely risks to gray whales and their prey and better inform decisions on siting pipelines and other infrastructure and activities.”

[The above two points are repeated in the main body of the Report on p. 96]

Section 5 (“The need for a comprehensive strategy to save western gray whales and their habitat”):

“A comprehensive, international strategy (including research) is essential for saving this whale population. The Panel recognised the need for a comprehensive strategy that addressed not only oil and gas development, but also other threats to the population. The results of population modelling (Chapter VII) showed that quite small impacts on the animals or their habitat, if they are persistent, could lead to the population’s extinction. A piecemeal approach, based on assessment of the impacts of one development project at a time, will not adequately address the western gray whale conservation problem, because the accumulated total of impacts may prevent recovery of the population even if the impact of each project can be limited to apparently acceptable levels. The survival of the population cannot be assured without a protection regime for the nearshore feeding habitat, aimed at limiting the combined impact of all current and future developments (including but not limited to oil and gas developments) on this habitat and the whales feeding there.”

B. From the main body of the report:

Section 3.1.2.5 (p. 52): “The possibility that spilled oil could enter Piltun Lagoon raises considerable concern. Circumstantial evidence suggests that organic detrital effluent from Piltun Lagoon is an important source of food for benthic communities outside the lagoon. This possibility may explain the fidelity of gray whales to the Piltun foraging area. Should spilled oil alter the lagoon such that detrital effluent is curtailed, the consequences for the gray whale population could be catastrophic. In concept, such a scenario could be investigated using appropriate field research methods. Without such studies, the effects of this and other plausible scenarios about indirect effects cannot be evaluated.”

Section 4.1 (pp. 65-66): “Dobrynin *et al.* (2004) speculated on the processes that form the broad Piltun zone of fine sand and the high productivity of the area. They suggested that the export of terrigenous material from Piltun Lagoon, specifically in spring when wave activity in the surrounding sea is limited by remaining sea ice, is one key factor. The nearshore eddies developing in the area apparently capture the particles and concentrate, redistribute and deposit them over an area to the east and north of Piltun Lagoon. The same processes may determine the export and retention of particulate organic matter that settles in that region.”

“As noted in section 3.1.2.5, transport of detrital effluent from Piltun Lagoon to adjacent benthic habitats outside the lagoon may be fundamentally important in understanding the persistent use of the Piltun feeding area by gray whales.”

[Reference: Dobrynin, D.V., Dementiev, M.N., Krasilnikov, E.A., Saleliev, A.A., Spiridonov, V.A. and Zeits, M.A. 2004. Western Pacific gray whale habitat: Physical structure revealed by remote sensing and necessary measures for protection. Unpublished

Report. Remote Sensing Laboratory, Soil Science Faculty, Moscow State University. 14pp.]

Chapter 6, section 1 (p. 74): “The dangers of ship collisions increase incrementally with each additional vessel operating in waters inhabited by gray whales, as do the dangers of oil and gas spills with additional platforms and pipelines, of noise disturbance with additional construction and oil and gas production, and of habitat degradation with expanding development of all kinds on and near the northeastern Sakhalin Shelf. Exxon’s plan to dredge and install a pipeline across Piltun Lagoon to transport oil from Sakhalin I is an obvious example. If such dredging is undertaken and it alters water and nutrient flow out of the lagoon, or if oil is spilled into the lagoon from a pipeline, it could add significantly to the risk of habitat degradation in the nearshore foraging area near and immediately north of the mouth of the lagoon.”

Chapter 8, section 4 (p. 96): “In addition, a spill or release of oil in or near Piltun Lagoon is a major concern because it could alter the ecological processes that maintain the Piltun (nearshore) foraging area where female gray whales nurse and wean their calves. This concern applies to both Sakhalin II and Sakhalin I, which includes plans for a pipeline crossing of the lagoon itself.”

Annex D (p. 107): “In both 2001 and 2002, amphipod and isopod crustaceans showed highest densities in areas immediately adjacent to the single entrance to Piltun Lagoon. Such patterns suggest an important role for export of benthic nutritional resources from the lagoon proper to the adjacent offshore waters used for feeding by gray whales.”

2. Report of the Interim Independent Scientists Group (IISG) Review Panel (ISRP) on Mitigation Measures to Protect Western Gray Whales during Sakhalin II Construction Operations in 2006. April 2006.

Section on Long-term Environmental Monitoring (LTMP): “Here we suggest attributes of LTMPs for the two known feeding areas (“Piltun” and “Offshore”) for western gray whales off northeastern Sakhalin Island, and for benthic communities within Piltun Lagoon. Lagoon monitoring is strongly encouraged because of the persistent proximity of the primary feeding area for western gray whales to the Piltun Lagoon entrance channel. This pattern is consistent with the hypothesis of a functional ecological linkage between Lagoon biota and gray whale feeding location. Where appropriate, we provide suggestions for LTMP attributes in both spatial and temporal contexts.

“Primary questions

Two primary questions must form the basis for LTMP implementation in the gray whale feeding areas and in Piltun Lagoon:

“1. How will pollution events such as oil spills, occurring in association with Sakhalin II activities, influence the structure and dynamics of marine benthic communities of

significance to the nutrition of the western gray whale population? How will such effects be distinguished from natural variation in the ecosystems of the Okhotsk Sea region?

“2. How will events such as pipeline or platform construction that produce physical alteration of natural habitats, occurring in association with Sakhalin II activities, influence the structure and dynamics of marine benthic communities of significance to the nutrition of the western gray whale population? How will such effects be distinguished from natural variation in the ecosystems of the Okhotsk Sea region?”

“Existing Studies and Data

Studies of benthic communities in the western gray whale feeding areas have been conducted annually since 2002. A data set of high quality, incorporating a number of relevant and important target variables, has resulted. Collectively, the existing data provide a comprehensive basis for initiation of LTMP work in the feeding areas.

“Field survey work was conducted on benthic communities within Piltun Lagoon in September 2002. Document 15 summarizes data collected in 2002, and provides a synthesis of relevant data collected in the Lagoon prior to 2002. Data available on Lagoon benthos are not as comprehensive as those collected in recent years in the feeding areas, but nevertheless are substantial and useful in planning LTMP work in the Lagoon. The historical data sets available on Lagoon biota are valuable in the context of understanding long-term trends in ecosystem structure and function.

“Suggestions regarding target variables and species

We suggest that the following variables, or classes of variables, should be the primary target variables for LTMP effort in the whale feeding areas. Selection of variables is based primarily on established data sets described in IISG Document 13-D.

Density and biomass of sampled animal species

Size distributions for dominant animal species

Fecundity patterns in dominant animal species

Sediment grain size distributions

Sediment total organic carbon fraction by mass

Sediment petroleum hydrocarbon residues by mass

“Based on data collected to date, we suggest the following, at a minimum, as species of particular interest in whale feeding areas, because of overall abundance and because of likely inclusion in gray whale diet.

Amphipoda

Pontoporeia affinis

Eogammarus schmidti

Ampelisca spp.

Isopoda

Synidotea cinerea

Saduria entomon

Cumacea

Diastylis spp.

“The above species should be considered for monitoring size distributions and fecundities. All are pericarid crustaceans, in which females have a marsupium bearing relatively large, easily enumerated eggs or recently hatched juveniles, counts of which can provide a fecundity index and information on seasonality of reproduction. Along with data for density and biomass, information on size distribution and fecundity of dominant species will provide additional insight into population dynamics that may be sensitive to impacts from Sakhalin II, and relevant to the foraging ecology of gray whales.

“Suggestions regarding methods

Piltun Lagoon

Lagoon benthic communities are dominated by large stands of plants, such as the seagrass *Zostera spp.* and the pond weed *Potamogeton perfolatus*, and by bivalve mollusks and amphipod crustaceans. Mean water depth in the Lagoon is < 3 m, and sampling must be done from small vessels. Quantitative benthic sampling of high quality will require use of coring devices that can be deployed effectively from small craft such as skiffs, or that can be operated by divers. We suggest that documentation of the extent and dynamics of large plant stands will be most effectively done by application of remote sensing methods, supported by sampling of plant biomass densities in the field, to allow estimation of total plant biomass on larger scales.

“Piltun Lagoon Entrance Channel

The transport of organic material from Piltun Lagoon to the adjacent offshore whale feeding areas may have substantial importance in sustaining the productivity of whale prey in the offshore grounds. We encourage the development of methods to monitor rates of transport of organic materials from inside the Lagoon to the adjacent offshore waters. Sampling should focus on phytoplankton, zooplankton, and various categories of detritus transported offshore, recognizing that dominant planktonic and benthic species in the Lagoon are generally different from those occurring offshore. An effort should be made to sample transport processes among seasons to the extent feasible, as ecologically significant transport periods may be temporally decoupled from whale feeding activity

“Suggestions Regarding Sampling Design

The determination of whether to sample repeatedly over time in the same location, or to place samples in newly randomized locations for each sampling effort, requires evaluation of costs and benefits. Newly randomized sample locations for each sample interval maximize the spatial scale of inference when data are interpreted. However, when randomly placed samples encompass multiple habitat patch types, variance in the data is typically increased, and the statistical power to detect trends in the data is reduced. In contrast, sampling at permanent locations repeatedly over time typically reduces variance in patchy habitats and increases the power to detect trends over time, but also reduces the spatial scale of allowable inference in data interpretation. We recommend the latter approach because of the value we see in high power to detect trends. In both approaches, variance and power can be manipulated by stratification. Inferential strength also is improved if the initial selection of permanent sample locations is random.

“Determination of minimum detectable change is an arbitrary decision, but it must be tempered by the realities of the variance structure in the data. Assuming that high power for detection of trends over time is a primary goal in LTMP design, desirable qualities of sample data include low variance, high replication, and small sampling interval. The attainable level of minimum detectable change emerges analytically from patterns of variance, replication, and sampling interval. In the case of both the feeding areas and Piltun Lagoon, field conditions likely constrain sampling interval to once per year in general. Logistical considerations also likely influence the number of replicate samples that can be gathered at a given location during a sample time step. We recommend that minimum levels of detectable change be set at 25% for total benthic animal biomass, and at 50% for species that are dominant community members, such as those listed above. With target values for minimum detectable change specified, it is then possible to compute the minimum number of replicate samples per sampled site per year that must be collected. If desirable levels of replication are not feasible and multiple sample series within years are not possible, then minimum detectable changes in data time series are forced to larger values. We strongly encourage LTMP designers to make a maximum effort to attain replication levels necessary for the specified levels of minimum detectable change, ensuring adequate power to detect trends in benthic animal data.

“Piltun Lagoon

For Lagoon sampling, we suggest pre-sampling stratification by dominant plant type or by dominant sediment type. Post-sampling stratification can be considered by animal assemblage type.

“We do not have recommendations for minimum detectable change levels in assessments of large plant stands based on remote sensing methods, because of lack of availability of indices of variance over time in stand extent in the Lagoon. We suspect that properly implemented remote sensing methods for plant stand size estimation will produce data sets with low variance and high consequent power to detect trends, potentially supporting the ability to establish small values for minimum detectable change.”

3. Report of the Western Gray Whale Advisory Panel (WGWAP) at its First Meeting, November 2006.

http://www.iucn.org/themes/marine/pdf/wgwap/WGWAP%201_3%2021%2011%2006.pdf

Section 11 (“Environmental Monitoring”): “The IISG report encouraged the development of Long Term Monitoring Plans (LTMPs) for benthic communities in the two known WGW feeding areas (‘Piltun’ and ‘Offshore’) and within Piltun Lagoon. It made a number of recommendations for the design of LTMPs in these areas. Lagoon monitoring was strongly recommended because of the persistent proximity of the primary whale feeding area to the Piltun Lagoon entrance channel, and the suspected enhancement of benthic productivity in the Piltun feeding area as a result of detrital effluent from the lagoon.

“Responses of Sakhalin Energy to the IISG recommendations for benthic monitoring were summarized in WGWAP 1/INF.13 and additional relevant material can be found in WGWAP 1/INF.29. Fadeev presented an overview of benthic studies supported by Sakhalin Energy on the NE Sakhalin Shelf, and during the meeting he provided comments to the Panel regarding the IISG recommendations. Except as noted below, there was general concurrence between the IISG recommendations and the company’s LTMP plans. WGWAP 1/INF.13 identified documents from previous years describing benthic communities on the NE Sakhalin shelf and in Piltun Lagoon.

“Sakhalin Energy’s objections to development of an LTMP in Piltun Lagoon are based on the premise that Sakhalin II project activities are not likely to influence the lagoon ecosystem. The Panel recognizes the spatial separation of Piltun Lagoon from Sakhalin II activities, but nevertheless continues to **recommend** studies of the linkage of Lagoon biota and detrital output with WGW feeding areas. The Panel’s view on this matter is driven by the potential linkage among areas by detrital transport and the potential for anthropogenic modifications of the lagoon ecosystem. The Panel recognizes the logistical challenges and potential costs of maintaining an effective LTMP in Piltun Lagoon, given its size and physical complexity and the spatial variation in within the lagoon ecosystem. It is **recommended** that Sakhalin Energy focus on measurements of quality and quantity of detrital transport from the Lagoon to whale feeding areas. Primary goals for study of detrital transport should be: identification of source species contributing to detrital mass, stable isotope signatures for detritus transported from the Lagoon to whale feeding areas, and interannual variation in quality and quantity of transported detritus.

“The Panel **recommends** that Sakhalin Energy researchers take the following concepts into account as they proceed to develop LTMPs of benthic communities in the whale feeding areas:

- (a) LTMP design should reflect consideration of possible spatial and temporal separations in processes important to benthic community structure, dynamics and productivity. Detritus transport connections between Piltun Lagoon and the whale feeding areas are an example of spatially distinct processes that could be important to whale food availability. Effects of winter and spring sea ice cover and movement on subsequent patterns and productivity of benthos provide examples of potentially important processes that are temporally disjunct.”

4. Report of the Western Gray Whale Advisory Panel (WGWAP) at its Second Meeting, April 2007.

[http://www.iucn.org/themes/marine/sakhalin/meeting_april07/WGWAP%20%20-%20FINAL%20Report%20-%202010%20May%2007%20\(2\).pdf](http://www.iucn.org/themes/marine/sakhalin/meeting_april07/WGWAP%20%20-%20FINAL%20Report%20-%202010%20May%2007%20(2).pdf)

Section 15 (“Whale Monitoring by Non-Sakhalin Energy Groups”): “The present WWF proposal for a nature reserve is not sufficiently developed for further scientific or technical comment by the Panel. However, the Panel **encourages** the continued development of any proposal that may contribute to improved conservation of the

western gray whale population. The Panel supports efforts that include protection of Piltun Lagoon from industrial development and other types of anthropogenic disturbance [WGWAP 2/021]. In previous reports the Panel and its predecessors (ISRP, IISG) have stated strong support for protection of both Piltun Lagoon and the nearby gray whale feeding area. In that regard, the Panel continues to have concern over any plans for a pipeline to be constructed across the northern part of the lagoon with potential for damaging/degrading the lagoon and surrounding land.”

5. Report of the Western Gray Whale Advisory Panel (WGWAP) at its Third Meeting. November 2007.

<http://www.iucn.org/themes/marine/pdf/wgwap/WGWAP%203%20Report%20Final%20%2021%2012%2007doc.pdf>

Section 6 (“Oil Spill Prevention, Preparedness and Response”): “*Ecological monitoring of Piltun Lagoon and feeding area*—At virtually all steps in the review of Sakhalin II, Phase 2, WGW panels have highlighted the importance of Piltun Lagoon and the Piltun feeding area to the conservation of WGWs. In particular, the panels have recommended rigorous, systematic collection of baseline information from both areas to provide an adequate baseline for measuring the effects of oil and gas operations, including in the event of an oil spill. The Panel **reiterates** that recommendation [WGWAP 3/015].

“*Restoration of lagoons, wetlands, beaches and dunes*—The value of the Piltun area as a feeding ground for the WGW population is based on ecological links of wetlands, lagoons and shallow-water nearshore environments. If a spill occurs, much of the nearshore environment could be damaged by response activities, with long-term adverse effects on the ecology of the feeding area and thus on gray whale foraging, demography and recovery. For that reason, the Panel **recommends** that any damage to the wetlands, lagoons, beaches and dunes of the Piltun ecosystem be addressed by restoration efforts as soon as possible following spill response activities [WGWAP 3/023].”