56	DFO			Physical Environment	Construction Mitigation - DFO notes that timing for the majority of in-stream work is scheduled between July 16 to September 15	In 2015, construction of the spillway cofferdam is scheduled for July 16 to October 4 (extending into the Whitefish spawning period)...what additional mitigation and/or construction techniques are proposed during this sensitive period?	DFO-0056	Proponent response addresses information request.
57	DFO			Physical Environment	Construction Mitigation - DFO notes that timing for the majority of in-stream work is scheduled between July 16 to September 15	Please provide detailed contingency plans for construction techniques proposed should a request to extend construction beyond proposed dates occur. DFO would appreciate the opportunity to review contingency plans in advance to ensure appropriate decisions with a timely response can be provided.	DFO-0057	Pre-emptive planning and design required for exemption to time restrictions
58	DFO			Physical Environment	Monitoring	DFO notes that there are no monitoring plans submitted within the EIS. We look forward to reviewing the following management and monitoring plans (as proposed to be developed in chapter 8 of the EIS): o Sediment Management Plan o Fish Habitat Compensation Plan o Waterways Management Plan o Aquatic Effects Monitoring Plan o Physical Environment Monitoring Plan	DFO-0058	See DFO-0055
59	DFO			Physical Environment	Monitoring	How will peat deposition be monitored? And assumptions in the EIS verified? (ex. Estimate only 1% of peat will be transported downstream)	DFO-0059	Proponent plan still in production and not available for review.
60	DFO			Physical Environment	Monitoring	Please provide a detailed map of baseline sedimentation sampling sites and proposed monitoring sites? Ideally, future monitoring sites should be located near the baseline sampling sites for accurate comparisons.	DFO-0060	Proponent plan still in production and not available for review.
61	DFO			Physical Environment	Bed Load	Between 2005-2007, approximately 350 bedload samples were collected, but this yielded few measurable samples (Appendix 7B). The EIS reports an estimated an average bedload of 4 g/m/s. How reasonable is this estimate given the insufficient samples to estimate the annual bedload discharge? What method(s) will be used to monitor bedload?	DFO-0061	Proponent plan still in production and not available for review.
62	DFO			Physical Environment	Bed Load	It seems that only 50th percentile flow examined – why not 5th and 95th?	DFO-0062	Proponent response addresses information request.
63	DFO			Physical Environment	Sedimentation - TSS	Is the relationship between turbidity/TSS developed using local (Gull Lake/Stephens Lake) data? Was there to be an ongoing calibration of the turbidity/TSS relationship to reduce induced error?	DFO-0063	Proponent response addresses information request.
64	DFO			Physical Environment	Sedimentation - TSS	Background TSS assumed to be 20 mg/l. EIS does not explain the rationale for using this number when the range is 5mg/l to 30mg/l. Please provide detailed rationale for choosing 20mg/l.	DFO-0064	Proponent response addresses information request.
65	DFO			Physical Environment	Sedimentation - TSS	Assumption that 70% of all fine particles will remain in suspension past Kettle GS. How can they determine this? Has this been modelled? How will the model/assumptions be tested?	DFO-0065	Proponent plan still in production and not available for review.
66	DFO			Physical Environment	Sedimentation - TSS	Suggest that discrete data loggers (TSS) are better than continuous collection data loggers. Discrete loggers should be verified using point sampling to verify data loggers especially in the first year. The use of discrete data loggers for existing environment and post project post project environment. The continuous data loggers are too variable and subject to error due to bio-fouling.	DFO-0066	Would the proponent please extract those parts of any sediment management plan (their answer states that it will be provide in the first quarter of 2013) that provides additional information pertinent to the question? Proponent plan still in production and not available for review.
67	DFO			Physical Environment	Sedimentation - TSS	EIS proposes to have the first post project monitoring station 1km downstream of the construction site in the "fully mixed zone". The location of the first monitoring station downstream of Keeyask construction site is too far away to assess impacts and effectiveness of mitigation. It is recommended that a turbidity/TSS monitoring site be placed at the construction site.	DFO-0067	Would the proponent please extract those parts of any sediment management plan (their answer states that it will be provide in the first quarter of 2013) that provides additional information pertinent to the question? Proponent plan still in production and not available for review.
68	DFO			Physical Environment	Sedimentation - TSS	Can the Proponent provide an analysis showing that its monitoring will have a high degree of confidence, or the power, to detect TSS above the action threshold?	DFO-0068	Would the proponent please re-state their answer to the question rather than refer to another response? Proponent plan still in production and not available for review.
69	DFO			Physical Environment	Sedimentation - TSS	The Proponent appears not to discuss effects of TSS specific to the individual VEC fish species. The Proponent's impact assessment appears to rely primarily on lethal TSS concentration effects. Can the Proponent provide an expanded discussion of sub-lethal or chronic impact risk assessment for anticipated TSS changes?	DFO-0069	Would the proponent please extract those parts of the EIS referred to and re-phrase them in a manner that provides a more detailed answer to the question?
70	DFO			Physical Environment	Sedimentation - TSS	Existing environment sedimentation models based on low, med and high flows (2059, 3032 and 4,327 cms). Do these relate to percentile flows? Post-project sedimentation modelling simulated under 50th percentile for year 1, 5, 15 and 30 years after impoundment, and under 5th and 95th percentile flow for 1 and 5 years after impoundment. Why different flow regimes for different time periods? The post-project sedimentation environment was also simulated under the 50th and 95th percentile flows using the eroded shore mineral volumes as estimated, considering peaking mode of operation for the time frames of 1 and 5 years after impoundment. Proposed monitoring to valid models?	DFO-0070	Proponent plan still in production and not available for review.

71	DFO			Physical Environment	Peatland Erosion.	Did not look at peat downstream of the generating station, claiming that peat would not go past the GS (only 1% would get past the GS – is this reasonable?). What monitoring is proposed to confirm this?	DFO-0071	Would the proponent please extract those parts of the EIS referred to that provide an assessment of the risk to fish, fisheries, and fish habitat of peat deposition from peat passing through the GS?
72	DFO			Physical Environment	Peatland Erosion.	Visual distribution (maps) of peatland deposition not presented in the EIS. How will peat deposition impact on known/suspected areas of fish habitat in the future forebay?	DFO-0072	Would the proponent please provide a GIS or similar analysis of peatland deposition in fish habitat in the future forebay? Would the proponent please provide an analysis, including a table of areas, of impact, given a biologically significant risk threshold, of impact area?
73	DFO			Physical Environment	Deposition - EIS states deposition loads will not change post project – about 3cm/year, based on about 30cm of sediment deposited in ten years since Kettle GS was built. "Based on extensive modelling (using Stephens Lake) and field verification", the majority of mineral sediments resulting from shoreline erosion are predicted to deposit in near shore areas...after year 1, rates predicted at 0-3 cm/y. Offshore = 0-1 cm/y after year 1. The south nearshore areas in gull lake predicted to experience highest deposition rate of 4-6 cm/y for year 1 under baseloaded conditions.	Do not provide sedimentation rates based on a range of flows. No detail on sampling conducted to establish baseline other than at Kettle GS. How will the sedimentation model be tested for accuracy? What monitoring will be conducted to validate model assumptions?	DFO-0073	Would the proponent now provide details from documents not provided with the EIS that were to follow (e.g., physical environment monitoring plan for second quarter 2013) that answer this question? Can the proponent provide information on thresholds for risk of sediment deposition (e.g., are 1-4 cm sediment thickness of concern or some other thickness)? Can the proponent carry out a GIS, or other, risk based assessment that delineates areas of pre-project sediment types of biological interest compared with post-project critical deposition thicknesses? Can the proponent provide a table of total areas by impact zone (e.g., upstream and downstream) of area affected by biologically significant deposition? Proponent plan still in production and not available for review.
74	DFO			Physical Environment	Sedimentation	Given the variation in sedimentation rates over time and the challenges in estimating sedimentation level, does the sedimentation analysis include a sensitivity analysis to reflect possible ranges in sedimentation and the effects on fish and fish habitat both upstream and downstream?	DFO-0074	Sensitivity analysis not provided.
75	DFO			Physical Environment	The EIS notes "Placement and removal of cofferdams/groins during Stage II Diversion will occur over three years (2017, 2018, and 2019) during the open water seasons. Most of these activities are predicted to result in increases in TSS of less than 5 mg/L above background, which would be within the...CCME guidelines for the protection of aquatic life. The exceptions include placement of the South Dam Rock Fill Groin, which is predicted to result in TSS increases of up to 15 mg/L above background, with increases of greater than 5 mg/L for a period of approximately 10 days in early September 2017. An increase in TSS of 7 mg/L for a period one month is also predicted during removal of the Tailrace Summer Level Cofferdam in September/October 2019.	The Proponent predicts several instances of average TSS increases greater than the CCME guideline for longer term impacts (e.g., inputs lasting between 24 h and 30 d should not exceed 5 mg/L above background). Are there additional opportunities, both reasonable and practical, to further prevent and mitigate sediment releases such that the guidelines can be met? For example, if a given TSS exceedance is in part due to shoreline erosion, would pre-emptive shoreline stabilization be an option?	DFO-0075	Proponent plan still in production and not available for review.
76	DFO			Physical Environment	The EIS notes "Prediction of the post-impoundment...environment upstream...was carried out by...numerical modelling...Depth-average mineral suspended sediment concentrations were estimated for average (50th percentile) flow for prediction periods of 1 year, 5 years, 15 years and 30 years after impoundment. Sediment concentrations were also predicted for low (5th percentile) and high (95th percentile flow conditions for...1 year and 5 years after...impoundment. While outside the zone of hydraulic influence, a qualitative assessment was carried out for...sedimentation...in Stephens Lake..."	Can the Proponent provide some explanation, or direct reviewers to its location, of why TSS modeling at selected flow percentiles, e.g., 50th percentile or 5th and 95th percentile, or other model settings, provide good estimates of likely effects on the aquatic environment?	DFO-0076	Can the proponent clarify why a median is used for the first, fifth, fifteenth, and thirtieth years while 5th, 50th, and 95th percentiles are only estimated for one and five years after impoundment? Proponent plan still in production and not available for review.
77	DFO			Physical Environment	The EIS notes "Placement and removal of cofferdams/groins during Stage II Diversion will occur over three years (2017, 2018, and 2019) during the open water seasons. Most of these activities are predicted to result in increases in TSS of less than 5 mg/L above background, which would be within the...CCME guidelines for the protection of aquatic life. The exceptions include placement of the South Dam Rock Fill Groin, which is predicted to result in TSS increases of up to 15 mg/L above background, with increases of greater than 5 mg/L for a period of approximately 10 days in early September 2017. An increase in TSS of 7 mg/L for a period one month is also predicted during removal of the Tailrace Summer Level Cofferdam in September/October 2019..."	If increases in TSS exceeding the CCME guidelines appear to be unavoidable, can the Proponent provide additional discussion and rationale (or direct reviewers to the location of that information in the EIS) for why the exceedances, in the Nelson River at Keeyask case, are not likely significant adverse environmental effects. For example, can the Proponent indicate that an exceedance of 7 mg/L TSS above background for 30 days in September/October is not likely to be in the sublethal or lethal severity of effect range for fish, fish eggs or larvae, benthic macroinvertebrates, or other aquatic organisms. In addition, can the Proponent say that the exceedance when added to the expected background range for that time of year is within the anticipated natural range of TSS in the Nelson River at the Project site, and in one case downstream to the estuary, at that time of year?	DFO-0077	Would the proponent please provide an expanded discussion of the type and extent of expected sub-lethal effects, extracting information as necessary from the EIS sections referred to?
78	DFO			Physical Environment	The EIS notes "data collected in the open water periods of 2005 to 2007 indicates...suspended sediment concentration generally lies within the range of 5 mg/L to 30 mg/L...from Clark Lake to Gull Rapids...sediment concentrations can vary within their normal range at a given location in a given day...variations...over a short period...can be due to many reasons, including local turbulences in the waterbody, changes in the meteorological environment, and local bank erosion processes...suspended sediment concentrations...in the open water period...2001 to 2004...show similar ranges (2 mg/L to 30 mg/L with an average of 12 mg/L)...A report prepared by Lake Winnipeg, Churchill and Nelson Rivers Study Board in 1975...documents a suspended sediment concentration range of 6 mg/L to 25 mg/L with an average of 15 mg/L based on...measurements in 1972 and 1973. Field studies...on the Burntwood and...Lower Nelson River reach also show a concentration range of 5 mg/L to30 mg/L (Acres...2004...2007b, KGS Acres 2008b...KGS Acres 2008c)...Suspended sediment concentration measurements during...winter...(January to April), of 2008 and 2009 reveal that sediment concentration variations in the winter period are larger than the open water period. A limited data set collected at monitoring locations in Gull Lake show a concentration range of 3 mg/L to 84 mg/L, with an average of 14.6 mg/L..."	The Proponent provides some ranges, point estimates, and expected durations of TSS changes. Would it be possible to provide, or direct reviewers to where this information is in the EIS, sample sizes and standard deviations for estimates? Where intervals that are not ranges, would it be possible to specify the level of confidence? E.g., are they 95% confidence intervals for a mean?	DFO-0078	Would the proponent please provide a description of the extent to which the historic TSS information can be expected to represent seasonal and year-to-year variation in TSS? Would the proponent please propose one or more composite sample sizes, averages and standard deviations as background criteria for expected TSS during construction for determining the power of its proposed monitoring program?

79	DFO			Physical Environment	The EIS notes, for mineral, as opposed to organic sediments:... "mineral TSS is generally predicted to decrease in the shallow and deep areas of the reservoir with the Project, most notably under high flows (95th percentile), although small increases (1–4 mg/L) are projected in some areas under some conditions (i.e., different flows and years of operation). The predicted changes in mineral TSS are also relatively similar for the peaking and base loaded modes of operation for median and high flows. In general, the predicted decreases (or occasionally increases) in mineral TSS are less than 5 mg/L under low, median, and high flows in shallow and deep areas for Years 1 and 5 of operation. The major exception would occur under high flows in reaches 7 and 8 (at the downstream end of present day Gull Lake) and most notably reach 9 (the reservoir immediately upstream of the GS) where larger decreases (up to 14 mg/L below background) are expected..."	The Proponent predicts TSS decreases. Impacts of TSS decreases appear not to be discussed. While there are no present federal guidelines e.g., in the CCME, has the Proponent considered the potential impacts of TSS decreases?	DFO-0079	Proponent response addresses information request.
80	DFO			Physical Environment	The EIS says "Mineral TSS would generally remain within the chronic Manitoba PAL water quality objective and the CCME PAL guideline (a change of less than or equal to 5 mg/L relative to background, where background TSS is less than or equal to 25 mg/L). The exceptions would occur in the immediate reservoir (reach 9) and reach 8 (the area north of Caribou Island) under high flow conditions, where decreases may be larger than the Manitoba water quality objective..."	When discussing TSS decreases the Proponent refers to TSS guidelines as being for changes. In fact, the guidelines talk about increases only – not changes in general – so that they do not really apply to decreases in TSS. Can the Proponent explain in more detail its criteria for discussing changes?	DFO-0080	Proponent's answer asks reader to re-read sections of the EIS. Would the proponent please extract the appropriate information from the EIS or provide additional information to answer the question?
81	DFO			Physical Environment	Water Quality: Project Effects, Mitigation, and Monitoring...Construction Period...Total Suspended Solids, Turbidity, and Water Clarity..." p 2-44 - 2-45 "Cofferdam Dewatering... Water that is trapped or accumulates behind cofferdams will be discharged to the Nelson River. An end- of- pipe criterion of 25 mg/L will be applied such that where met, water behind cofferdams will be directly released to the Nelson River. Where this target is not met, cofferdam water will be pumped to settling ponds and discharged to the Nelson River when the end-of-pipe TSS concentration is less than 25 mg/L (PDSV, Keeyask GS EnvPP). Effects on TSS in the Nelson River are expected to be negligible in the fully mixed condition; small, localized increases in TSS may occur near these point sources..."	The Proponent refers to its proposed end-of-pipe allowed TSS of 25 mg/L for several activities. However, according to the CCME, that criteria is only acceptable for short term (e.g., 24 h) TSS increases. Can the Proponent provide additional information on the expected duration of activities for which it proposes the 25 mg/L criteria. For longer term TSS increases (e.g., inputs lasting between 24 h and 30 d), can the Proponent provide prevention measures that will meet the guideline of an increase not greater than 5 mg/L?	DFO-0081	Proponent response addresses information request.
82	DFO			Physical Environment	The EIS notes "An Environmental Protection Program has been developed to mitigate, manage and monitor environmental effects during the Project construction and operation phases. While descriptions of the existing environment are based on measurement and observation, descriptions of effects and mitigation designed to address adverse effects are predictions based on technical scientific studies and analysis, professional judgement and Aboriginal traditional knowledge. Monitoring will determine if these predictions are correct and if mitigation measures are working as expected. If unexpected effects are detected, the program will also define processes for determining appropriate adaptive management programs and practices. The Environmental Protection Program covers the "who, what, when, where and how" of protecting and monitoring the environment. Manitoba Hydro has a contractual responsibility for implementing the program delegated by the Partnership. The Program will consist of three types of plans....1. Environmental Protection Plans, to provide detailed, site-specific environmental protection measures to be implemented by the contractors and construction staff to minimize environmental effects from construction of the generating station and the south access road;... 2. Environmental Management Plans, focused on specific environmental issues, such as sediment management, access management, fish habitat and heritage resources; and...3. Environmental Monitoring Plans, to describe monitoring the effects of construction and operations on the biophysical, physical and socioeconomic environments using both technical science and Aboriginal traditional knowledge. Each plan includes an implementation strategy that, as required, may include contractual arrangements, training, compliance inspections and communication of results. The Keeyask Cree Nations will be directly involved in monitoring implementation by leading the Aboriginal traditional knowledge monitoring program and working side-by-side with scientists as part of the technical science-based monitoring and participating in the Partnership's Monitoring Advisory Committee. Manitoba Hydro will oversee monitoring activity to confirm that work is in accordance with the finalized, regulator approved plans..."	The Proponent refers to monitoring and Environmental Protection Plans (EnvPP) for sediment management. Are these described in detail in the EIS? While mitigation measures are described in the EIS that assist in preventing sediment deposition, DFO has been unable to find details of monitoring or action plans (management) for mitigation. If the detailed information is not shown in the EIS, can the Proponent provide that information separately from the EIS to continue the Environmental Assessment? The Environmental Protection, Environmental Management, and Environmental Monitoring plans are of significant interest to reviewers determining if there is likely to be a significant adverse effect after taking mitigation into account.	DFO-0082	Proponent response addresses information request.
83	DFO			Physical Environment	"Water Quality: Project Effects, Mitigation, and Monitoring...Construction Period...Total Suspended Solids, Turbidity, and Water Clarity..." p 2-40 ff "Cofferdam Placement and Removal...during Stage I and II Diversions have the potential to increase TSS in the Nelson River...results...presented in detail in the PE SV, section 7.4.1...Predicted increases in TSS refer to the fully mixed condition, approximately 1 km downstream of Gull Rapids..."	The Proponent notes that it has modeled TSS downstream at 1km from the construction area in the fully mixed zone. Will the Proponent be able to monitor TSS closer to the construction areas? What sort of area might be affected by construction TSS increases greater than those predicted upstream of the fully mixed zone. What are the, at source, sediment loading TSS concentrations likely to be, how extensive might they be in area, and what might their durations be?	DFO-0083	Would the proponent please re-iterate information provided for a previous question so that the reader does not have to refer to another response? The answer refers to information not provided with the EIS. Please use information from documents developed after the EIS to provide an answer to the question. Would the proponent please describe the extent and nature of plumes exceeding effect thresholds and evaluate them for potential lethal and sub-lethal risks?

84	DFO			Physical Environment	Information does not appear to be present in the EIS but is required to determine if monitoring can adequately determine potential problems and appropriate actions taken to mitigate unexpected events.	Can the Proponent provide an analysis showing that its monitoring will have sufficient power with high confidence, to detect TSS above the action threshold (regulatory guideline)? For example, how likely is it that the Proponent can detect environmental changes that result in elevated TSS that exceed critical effect sizes such as 5 mg/L above background? Will the number of samples collected during monitoring be sufficient to correctly conclude, with a confidence of say 95% [i.e., a high confidence), that there is a difference of, say, 5 mg/L or more above background?	DFO-0084	Proponent plan still in production and not available for review.
85	DFO			Physical Environment	The EIS, in the aquatic effects supporting document section 2 on water and sediment quality, notes: "There are few studies that have reported the acute or chronic toxicity of TSS to fish species represented in the Aquatic Environment Study Area. Lawrence and Scherer (1974) reported that the 96-hour lethal concentration (LC50) for lake whitefish (Coregonus clupeaformis) was 16,613 mg/L. McKinnon and Hnytka (1988) found relatively high increases in TSS (instantaneous maximum = 3,524 mg/L and 1-day average concentration = 524 mg/L) caused by winter pipeline construction did not have any direct effect (no downstream emigration and no mortalities) on the fish community of Hodgson Creek, NT. This study is notable as four of the fish species found in Hodgson Creek - northern pike (Esox lucius), lake chub (Couesius plumbeus), longnose sucker (Catostomus catostomus), and burbot (Lota lota) - are also found in the Aquatic Environment Study Area. As indicated in Section 5.4.2, northern pike may spawn in the nearshore areas of the Keeyask reservoir, even during the initial years of operation. Therefore, early life history stages of northern pike may be exposed to elevated concentrations of TSS for several years post-impoundment. No information on the acute or chronic toxicity of TSS to northern pike eggs or larvae could be located. Information for early life history stages of other species represented in the Aquatic Environment Study Area is also sparse and many of the available studies do not differentiate between the effects of suspended particulate materials and sediment deposition. However, the available scientific literature indicates a potential for reduced hatching success in salmonids exposed to elevated TSS concentrations on the order of two months or more, at concentrations ranging from 6.6–157 mg/L (Table 2-17). In addition, northern pike eggs would also be exposed to the combined effects of sedimentation and elevated TSS. Therefore, should northern pike spawn in the nearshore, flooded areas of the reservoir in the initial years of operation where organic TSS will be notably elevated, reduced hatching success of northern pike eggs is likely. Conversely, elevated TSS and turbidity can provide benefits to some fish species and life history stages. Reduced water clarity can reduce the risk of predation by visual predators, which in turn can enhance survival of juvenile fish (e.g., Sweka and Hartman 2003) and may favour planktivorous fish..."	The Proponent discusses effects of TSS specific to the individual VEC fish species. However, much of the Proponent's impact assessment appears to rely primarily on general and lethal TSS concentration effects. Can the Proponent provide an expanded discussion of sub-lethal or chronic impact severity of effect risk assessment for anticipated TSS changes?	DFO-0085	In the absence of specific lethal and sub-lethal data for various species and life-stages, would the proponent provide some hypothetical modelling for evaluation of sub-lethal risks?
86	DFO			Physical Environment	"Keeyask Generation Project Environmental Impact Statement Supporting Volume Aquatic Environment June 2012" (disc 2), p1A-2ff... Restricted activity timing windows...DFO...in northern Manitoba, no in-water or shoreline work is allowed during the 15 April – 30 June, 15 May – 15 July, and 1 September -15 May periods where spring, summer, and fall spawning fish respectively are present, except under site- or project-specific review and with...implementation of protective measures...Based on data from Keeyask field investigations...proposed area-specific timing windows for restricted in-water construction activities are...15 May – 15 July for spring and summer spawning fish and 15 September – 15 May for fall spawning fish...scheduling of construction activities that require working in water have been developed and modified to the extent practicable to avoid or minimize the potential for disturbance to fish in the Keeyask area during spawning, and egg an fry development periods...Adjustments to scheduling...to restrict construction and removal of structures to times of ...year when sensitive life stages of fish are least likely to be present are summarized in Table 1A-2..." A summary listing shows these are mostly for cofferdam construction and removal "To the extent possible, work in water has been scheduled to avoid interaction with fish and fish habitat during the spring and fall spawning periods...When avoidance of both spring and fall spawning periods was not possible due to critical construction sequences, avoidance of spring spawning periods was given priority over avoidance of the fall spawning period...Additional mitigation of potential disturbances to fish and fish habitat will be gained by constructing each cofferdam in a sequence that minimizes the exposure of readily-transported fines to flowing water..."	A key mitigation is timing of in-water activity to avoid impacts on VEC fish species. Can the Proponent describe its contingency plans for unavoidable changes in scheduling. E.g., if a TSS episode exceeding the CCME guidelines is relatively benign for adult whitefish migration to spawning areas, is the same episode when delayed due to schedule changes similarly benign for incubating whitefish eggs? What sort of information would be available to rapidly assess the potential risk of a schedule change? What criteria would the Proponent use to trade-off costs to the project and costs to a VEC fish species?	DFO-0086	The proponent's answer refers to action plans yet to be developed. Would the proponent provide details of action plans for unanticipated scheduling changes that are protective of fish, fisheries, and fish habitat?
87	DFO			Physical Environment	Previous daily TSS sediment monitoring at the Wuskwatim GS construction site had frequent problems with bio-fouling of sensors.	Can the Proponent provide additional information on its anticipated TSS monitoring showing that problems with previous monitoring, e.g., bio-fouling of sensors, has been anticipated and solved?	DFO-0087	Can the proponent provide additional information on its anticipated TSS monitoring showing that problems with previous monitoring , e.g., bio-fouling of sensors, has been anticipated and solved? Proponent notes that the SMP to be provided "in the first quarter of 2013..." provides details. DFO notes that a draft, referred to as an informal draft was received on October 17, 2012 noting that a formal version would follow after discussion with regulators. Would the proponent provide details, specific to the biofouling risk, from the proposed SMP to answer the EIS question? Awaiting receipt of in-stream Construction Sediment Management Plan (SMP).
88	DFO			Physical Environment	Details of the development of the turbidity/TSS relationship do not appear to be provided. DFO feels it is necessary to know details of the relationship and plans for ongoing calibration to assess whether monitoring will be adequate for effective adaptive management.	Can the Proponent provide additional information on its plans for developing a turbidity/TSS relationship, assuming that is being considered, and details of procedures for calibrating the relationship to changing conditions of sediment characteristics, variation with water depth, seasonal variation, and generally correcting for "drift" from the initial relationship?	DFO-0088	Proponent response addresses information request.
89	DFO			Aquatic Environment	Appendix 1A - Part2	How will potential risks associated with Sturgeon stocking and interactions with wild stock be addressed? Loss of genetic integrity, ecologic imbalance and community structure shift?	DFO-0089	Given our limited understanding of the intricacies of this issue, concern over potential implications will remain until the proponent can satisfy concerns through scientific study.

90	DFO			Aquatic Environment	Appendix 1A - Part2	Assuming sturgeon exhibit natal philopatry for spawning locations, significant genetic structure may be apparent even if there is considerable mixing of groups between spawning events. Will this be accounted for when choosing individual broodstock?	DFO-0090	If attempts to capture sufficient broodstock from within the same population are unsuccessful, DFO will anticipate discussion before alternatives are considered.
91	DFO			Aquatic Environment	Appendix 1A - Part2	Has consideration for the effects of the location of the new hatchery facility on imprinting been made?	DFO-0091	Given the absence of data or limitations of data available, DFO suggests a precautionary approach to this aspect of the project. The inclusion of stream side rearing facilities will offer reassurance that sturgeon will be retained until such time as study proves otherwise.
92	DFO			Aquatic Environment	Appendix 1A - Part2	Because the chances of capturing a ripe female from which to collect eggs is low, the use of ovaprim is suggested, yet long term effects are unknown. How will this be addressed?	DFO-0092	DFO will expect to be provided with the results of the U of M study when they become available.
93	DFO			Aquatic Environment	Appendix 1A - Part2	Should the original population be decimated, how will the population within the Gull Reach be maintained?	DFO-0093	Proponent's answer asks reader to re-read sections of the EIS. Would the proponent please extract the appropriate information from the EIS or provide additional information to answer the question?
94	DFO			Aquatic Environment	Appendix 1A - Part2	The recruitment model/unexploited scenario mimics the Wisconsin guideline. There is acknowledgement that these numbers may be too low given the guideline was developed based on rivers smaller that the Nelson. How will final numbers be derived?	DFO-0094	This contradicts statements in proponent response provided in DFO-0052, "CPUE was not used to estimate population size" and DFO-0017 "CPUE was not used in statistical analysis"
95	DFO			Aquatic Environment	Appendix 1A - Part2	Need for a protocol to accrue the maximum benefit from the stocking program. Once genetic integrity has been disrupted how can the situation be reasonably corrected? "Given uncertainties surrounding genetic mixing of stocks, the initial stocking plan will likely attempt to maintain the existing genetic structure and collect spawn from the same subpopulations as will be stocked. However given uncertainties and difficulties associated with spawn collection, a second contingency strategy may be required...spawn will be collected at sites that are genetically the most similar to proposed stocking locations." We require assurance that the genetic differences that exist pre development will persevere. Appropriate analysis will be required to address this.	DFO-0095	Proponent response addresses information request.
96	DFO			Aquatic Environment	Appendix 1A - Part2	Disease control in stocked fish – how will this be monitored? Should a problem be identified, how will it be rectified?	DFO-0096	The specifics of CFIA regulations are beyond DFO's mandate - CFIA should be asked to comment on this. DFO would be interested in the content of the Standard Operating Procedures once developed.
97	DFO			Aquatic Environment	Appendix 1A - Part2	Concern over the acquisition of sufficient broodstock to avoid genetic variability. There is acknowledgement that collecting spawning individuals will be unlikely. Concern over reliance on the use of gametes from just a few individuals (EIS suggests 2 females per year) and the subsequent release of closely related offspring. Decrease in herozygosity/ genetic drift/allele loss and thereby lower genetic diversity. Please provide detailed report(s) that examined these challenges.	DFO-0097	DFO will expect to be provided with the results of the Bernatchez study as available
98	DFO			Aquatic Environment	Appendix 1A - Part2	Given predications of accumulated sedimentation/peat accumulation and subsequent influences in water chemistry (including decreasing oxygen and increasing mercury levels) is stocking the forebay with sturgeon a rational option?	DFO-0098	DFO is interested in knowing more detail about the amount of change in the reservoir. The Proponent's answer talks about the post-project but does not compare it to the pre-project. Would the proponent please provide a pre- versus post-project comparison? "Stocking lake sturgeon into the Keeyask Reservoir is a rational option to recover populations" Please provide publications in support for this conclusion, given mercury in fish tissue significantly elevate post project.
99	DFO			Aquatic Environment	Appendix 1A - Part2	Stocking will continue as long as required to achieve and maintain the stated DFO (2010) RPA for DU3. (pg 18) Long term program expected for a generation (25 years) or in perpetuity if needed. Is the proponent prepared to stock lake sturgeon as long as required (i.e. beyond 25 years?).	DFO-0099	Proponent response addresses information request.
100	DFO			Aquatic Environment	Appendix 1A - Part2	Given the challenges of detecting changes in sturgeon (growth, age, etc.) over the short term, how will success/failure be determined?	DFO-0100	To date, sample sizes for lake sturgeon in the study area has been challenging due to population size. Will sample sizes be sufficient to detect statistical change in life history parameters post project?
101	DFO			Aquatic Environment	Appendix 1A - Part2	Given the challenges of detecting changes in - Phased approach to passage – have possible retrofit options been identified? - Have other forms of d/s passage been identified?	DFO-0101	Proponent response addresses information request.
102	DFO			Aquatic Environment		The EIS indicates that the turbine has been designed to maximize fish survival compared to other Manitoba Hydro generating stations. Please provide a table to compare turbines of similar design and on similar systems.	DFO-0102	DFO was looking for mortality and injury rates for fish based on the study completed at Kelsey which showed that both mortality and injury are greater for fish of increasing length over 500 mm.
103	DFO			Aquatic Environment		The EIS indicates 90 % survival for fish up to 500mm. Can this be further broken down into species, sex, maturity and length for the VEC fish species within the Keeyask Study area. An analysis/graphs of survival rates and injury rates should be provided.	DFO-0103	A failure of the Franke analysis is the lack of size and age specific mortality rates, which are crucial for assessing impacts to populations and predicting change.

104	DFO			Aquatic Environment		Several recommendations to minimize mortality that can be incorporated into hydro facilities include: using trashracks with reduced bar spacing while preventing further impingement, using temporary overlays with the existing trashracks to reduce clear spacing during migration periods, use of partial depth curtain wall over existing trash rack, installation of an inclined or skewed bar rack system upstream of the intake, barrier or stop nets set upstream in the forebay, and use of partial depth guide walls or an angled louver system upstream of the intakes coupled with a bypass system. Will the powerhouse be designed to incorporate some of these features if monitoring indicates that fish mortality is higher than predicted? Additional biological data and studies will be required post construction to better assess the requirements and potential mitigation for both potential downstream passage and protection. Also, these studies should determine the overall number of fish expected to pass through the turbines.	DFO-0104	DFO should be provided with an operating regime and an estimate of mortality under various flow/seasonal conditions. Mortality rates for fish over 500mm required.
105	DFO			Aquatic Environment		Survival rates can be maximized for entrained fish if operation of the turbines is at maximum efficiency. How will Keeyask be operated to minimize mortality?	DFO-0105	Elaboration required. Could turbine operation mitigate impacts to fish during critical life stages (e.g. -Y-O-Y drift)?
106	DFO			Aquatic Environment		What are acceptable mortality rates based on the fish community and population in the Keeyask study area?	DFO-0106	Information on acceptable mortality rates not provided (e.g. literature).
107	DFO			Aquatic Environment		A detailed monitoring plan should be developed to assess mortality of fish passing through the station and spillway. How will this impact the fish community?	DFO-0107	See DFO-0015
1	HC	AE SV 2	5C-59	Socio-Economy	Critical review of the HHRA: The baseline mercury levels in moose and snowshoe hare were not obtained from data collected in the Keeyask region but rather from data collected outside of Manitoba. The use of off-site data increases the degree of uncertainty in the conclusions presented in the HHRA regarding human exposures to this contaminant. The HHRA recommends monitoring mercury levels in wild game so data that is representative of the impacted region is obtained.	HC supports the recommendation in the HHRA that the monitoring of wild game be undertaken. This information would serve to validate some of the assumptions used in the HHRA (e.g. off-site data for moose and snowshoe hare) and also beneficially serve as baseline data for future Keeyask HHRAs and the assessment of risk related to other hydro generation projects planned within the region (e.g. Conawapa).	HC-0001	HC is available to review local wild game monitoring programs results and human health risk assessments of such in the future, upon request, including any future analyses of data for local wild game (e.g. caribou). HC noted a typographical error in Table 7-1, page 89 of the HHRA. Under the recommendation for further action for waterfowl, it should read periodic volunteer sampling of "waterfowl", not "wild game".
2	HC	AE SV 2	5-214 to 5-224	Socio-Economy	Mercury and human health – proposed mitigation measures: Based on the results of the HHRA, fish consumption recommendations were developed. HC agrees with the need for such recommendations and in general, would also concur with the recommendations themselves. However, HC notes that with respect to recommendations of "unrestricted eating" for all fish with less than 0.2 ppm mercury, the current edition of the Guidelines for the Consumption of Recreationally Angled Fish in Manitoba (2007) recommends that women of childbearing age and children under 12 years, limit their consumption of fish with less than 0.2 ppm mercury to 8 meals per month. The HHRA recommends that fish consumption advisories be communicated to local First Nations and communities. Also, based on fish monitoring data, additional human health risk assessments will be undertaken every 5 years after peak mercury levels have been reached to determine if consumption advisories need to be changed.	HC advises adopting Manitoba's guidelines recommendation limiting consumption for women of childbearing age and children under 12 years with respect to fish with less than 0.2 ppm mercury to provide added protection of health for these sensitive receptors. HC would consider this approach reasonable but would advise that if monitoring results show that mercury levels in fish are higher than the predicted maximum levels in the HHRA, prior to reaching their actual maximum levels, fish consumption advisories should be re-visited to ensure that they remain protective of human health.	HC-0002	HC has previously submitted a response to the CEA Agency in its letter of December 28, 2012. HC disagrees with the HHRA conclusion of supporting unrestricted eating of fish with elevated Hazard Quotients (eg. HQ of 14 for whitefish from Gull and Stephens Lakes). HC welcomes further discussions on mercury levels in fish and the use of provisional Tolerable Daily Intakes (pTDI) of 0.47 micrograms (µg) methyl mercury (MeHg) per kilogram of body weight per day (kg-bw/day) for adults, and 0.2 µg MeHg per kg-bw/day 0.2 ug/kg bw/day for women of childbearing age in human health risk assessments. HC advises the risk communication plan be separate from the HHRA and included within a risk management plan as mitigation for this project. HC welcomes further discussion and is available to review the risk management plan upon request.
3	HC	AE SV 2	5-104 to 5-120	Socio-Economy	Mercury and human health: The EIS indicates that communication products to address adverse health impacts will be developed.	It should be noted that the determination and implementation of risk management strategies for country foods in the project area fall under the responsibilities of provincial and/or municipal authorities. However, HC considers accurate communication strategies a very important tool in the reduction of risk to Aboriginal health with regards to country foods. HC would be willing to review proposed risk management approaches and communication products to provide its opinion.	HC-0003	HC has reviewed the communication products provided, and some preliminary comments are provided in the attached table (*Formative Review of Risk Comm Products*). HC would be pleased to meet with the proponent to undertake a more thorough discussion of the communication products, upon request. HC advises that the focus of the communication products be on the protection of the most sensitive receptors first (i.e. pregnant women and women of child-bearing age, and children). HC is available to review communication products that are developed for the post-impoundment scenario, upon request.