U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Assessment and Restoration Division
290 Broadway, Rm 1831
New York, NY 10007

December 14, 2009

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Dear Secretary Bose:

On behalf of the Department of Commerce, the National Oceanic and Atmospheric Administration's Office of Response and Restoration (NOAA OR&R), in its natural resource trustee capacity, works to protect and restore coastal resources from threats related to releases of hazardous substances and oil spills. NOAA has a long history of working on the contaminated sediments of Grasse River and is seeking restoration of the river through remedial and natural resource damage efforts. Construction of the Massena Electric Department's dam could interfere with those plans. NOAA OR&R therefore appreciates the opportunity to comment on Massena Electric Department's (MED) October 2009 Proposed Updated Study Report Massena Grasse River Hydroelectric Project, FERC Project No. P-12607.

NOAA previously submitted comments on several documents related to the proposed new dam in Massena, New York. Many of these comments are relevant to the Updated Study Report. These submissions include comments on the January 2007 Massena Grasse River Hydroelectric Project Scoping Document 1, the May 2007 FERC Scoping Document 2, the Town of Massena's May 2007 Proposed Study Plan, and the Oct 2007 FERC Study Plan Determination, the January 2008 Proposed Final Study Modifications to the Study Plans, and the October 2008 Initial Study Report Project for the Massena's Grasse River Multi-Purpose Hydroelectric Project.

Section 3.1 Lake Sturgeon Movement and Spawning

Goals of the lake sturgeon studies were to determine if lake sturgeon spawn in the Grasse River between the Massena Power Canal and the breached weir downstream of the Main St. bridge; timing and movement of spawning size adult lake sturgeon within the project area; how they use the area (e.g., staging or seasonal habitats); and the extent of juvenile lake sturgeon movement within the project area. MED conducted gill-net efforts, egg trapping surveys and radio-telemetry studies to meet study goals.

FERC's in its December 15, 2008 letter to MED concluded that the 2007-2008 egg survey study results "may suggest the need for another year of egg sampling or a modified study approach". Subsequently, FERC in its February 17, 2009 required performance of additional sturgeon studies in 2009. These included egg trapping surveys to be conducted for a minimum of 21 days

or until the end of May if no sturgeon eggs are collected during the initial 21 day period and tracking studies during the egg collection period. Egg surveys were conducted for 22 days and one egg was collected in the riffle/rapid area downstream of the breached Massena weir on the fourth sampling day. Females and males in spawning condition were also collected between the Massena Power Canal and the breached weir. While NOAA's preference would have been for MED to extend the egg collection period through the end of May to further document the amount of spawning in this area, the 2009 data demonstrate conclusively that sturgeon spawn in the Grasse River within the project area and as far upstream as the Madrid dam.

The 2009 tracking studies demonstrated that some sturgeon reside year-round within the Grasse River while others move between the Grasse and St. Lawrence rivers. The Updated Study Report therefore recalculated lake sturgeon abundance because the 2008 Study Report assumed a closed population when generating estimates of the Grasse River lake sturgeon. Those methods suggested approximately 585-592 individuals greater than 480 mm in total length. Lake sturgeon abundance based on open population estimator models was given as 793 lake sturgeon. Abundance estimates and the distribution of sturgeon in the upper, middle and lower sections of the river between Madrid Dam and the mouth points to the importance of the Grasse River as habitat to various life stages of lake sturgeon.

Gill netting results documented smaller size sturgeon than previously reported by others from the St. Lawrence River but very few sturgeon smaller than 500 mm total length were captured and none less than 150 mm. The Updated Study Report suggests that this may be due to differences in mesh size. This may also be due to the importance of the Grasse River as juvenile habitat. Young of year sturgeon are approximately 100-127 mm in length, yet, virtually no information has been collected on their abundance or habitat usage within the project area. NOAA recommends a study be conducted in 2010 in the same sampling locations previously sampled to ascertain usage of the upper, lower and middle river by sturgeon less than 450 mm in length and in particular young of year sturgeon using size appropriate gear. The Relevant Resource Management Goal is the protected status of sturgeon and the potential change or destruction in habitat from dam construction. The project nexus is that dam construction could potentially deprive young of year fish of critical habitat through habitat modification. The focus of this supplemental study is to determine the distribution, abundance, and movement of young of year sturgeon and juvenile sturgeon less than 450 mm in length between the Madrid dam and the mouth of the Grasse River.

The MED studies also evaluated habitat usage by adults and juveniles in the Grasse River by comparing location of collection with bottom substrate maps. No significant differences were exhibited by age group but strong site fidelity was observed to specific reaches of the river on a season or annual basis although individual juvenile sturgeon were recorded moving significant distances. Areas of strong site fidelity within the middle river are located within the proposed impoundment area and most likely to be significantly altered by dam construction. The Updated Study Report would have benefitted from a description and supporting maps of the areas currently used specifically for feeding, refuge, overwintering, and spawning.

The findings presented in the Updated Study Report highlight the importance of the Grasse River to various life history stages of lake sturgeon. Dam construction will alter the existing conditions of the Grasse River, in part by creating an 8 mile impoundment, by destroying spawning habitat

at site of construction and by cutting off access to existing spawning and other habitat further upstream. Alternations to Grasse River habitat from dam construction have the potential to harm both Grasse River and St. Lawrence lake sturgeon populations.

Specific Comments

Figure 14 – age frequency should also be presented stratified by gender.

Section 3.2 Fish Community Studies

FERC, in its Feb 17, 2009 letter to MED requested chinook salmon data not submitted with the Initial Study Report. Chinook sampling results were included in the Updated Study Report and confirmed the presence of salmon in the Grasse River including fish in spawning condition. Chinook salmon were the most abundant species captured in the upper river with the small-mesh gill nets. One salmon was also captured in the lower river. Salmon redds were surveyed, none were found but visibility was poor so the lack of confirmation is not indicative of lack of spawning. Eastern sand darters use sandy substrate as spawning habitat where a single egg is deposited and buried (MSUE 2004). Mooneye prefer swift water with sand, gravel, or rocks substrate for spawning (NSYDEC 2009, Outdoor Alabama 2008). Greater redhorse prefer swift moving water with rocky bottoms. A significant number of redhorse were gill netted but not identified to species and recorded to genus only. This could have resulted in the inadvertent failure to identify species of special interest as part of the MED fish community studies. Fish community objectives have been developed for a number of species the St. Lawrence River (LaPan et al. 2001) including the fish identified as of special interest in the Updated Study Report.

The Updated Study Report provides a summary of the 2009 egg survey. One sturgeon egg was identified. Non-sturgeon eggs were archived but neither enumerated nor identified. NOAA recommends identification of these eggs to determine if any of the eggs are from an appropriate subset of species of special interest (salmonids, eastern sand darter (state threatened), mooneye (state threatened), muskellunge or greater redhorse). Analysis of archived samples provides an opportunity to further evaluate the impact of the river on spawners without conducting additional field work. NOAA previously requested additional egg trapping studies should be performed to evaluate the extent of walleye spawning habitat use and production. Walleye studies were to be performed to address one of NYSDEC disputed issues. NOAA recommends identifying whether any of the archived eggs confirm walleye spawning habitat upstream of the breached weir if this data is not planned for inclusion in the report to NYSDEC. NOAA looks forward to the opportunity to review that report upon its completion and integration of the findings into Exhibit E.

FERC also requested incorporation of the fish length and weight as part of license application filing as a means of describing the quality of the general fisheries. Length frequency distributions were provided for walleye and lake sturgeon in the Updated Study Report. Weight frequency distributions were not presented.

FERC's guidelines for preparing Exhibit E include a presentation of the temporal and special distribution of fish and aquatic communities, and any associated trends, species and life stage

composition, standing crop, age and growth data, spawning run timing, and extent and location of spawning, rearing, feeding, and wintering habitat. The studies conducted to date do not appear sufficient to meet these future requirements, especially for the majority of the 9 species of special interest. Consideration should be given to the implementation of further studies to meet the needs of Exhibit E, especially those for muskellunge, eastern sand darter, greater redhorse, Chinook salmon and Atlantic salmon.

Specific Comments

MED's November 17, 2009 letter to FERC suggests that salmon redds were surveyed in 2008 and 2009 but the Updated Study Report presents results for 2008 only. The report should be corrected if 2009 surveys were performed.

Section 3.9 Additional Phase II Environmental Site Assessments (ESA)

FERC in its February 2009 letter identified deficiencies in the Phase II Environmental Site Assessments and requested several study modifications. These included expanding the geographic scope of the study above the 178 ft elevation to encompass the maximum ice-related water surface elevation and preparation of maps identifying the ice-related backwater elevation for a 100-year flood condition.

Environmental Site Phase 1 and II Assessments are inadequate since they assess contaminant concentrations against soil rather than sediment benchmarks (see specific comments, below). The analyses do not need to be repeated but the results should be compared against the appropriate benchmarks and reports updated. Maps depict open water 100-year contours but do not appear to show the ice-related backwater elevation for a 100-year flood condition. For Figures 3-Figures 8, if "Inundation (Ice)" depicts the ice-related backwater elevation for a 100-year flood condition, this should be made more transparent. A series of figure should be included that show areas tested for contamination and potential sources not tested. Additional sampling may be warranted in the future because the lack of debris piles or obvious staining may not preclude the presence of contaminants above ecological concern and the full extent of horizontal and vertical contamination associated with observed piles should be delineated prior to excavation. Consideration should be given to expanding the analysis to include the area between the 100- and 500-year flood condition since FEMA (2009) describes this as an area of moderate flooding hazard.

Specific Comments

Arcadis letter, Soil Analytical Data Summary, Para 2: Four soil samples were collected from behind 81 Center St and analyzed for volatile organics, semi-volatile organics, PCBs, and metals. Benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluorathene, and chrysene exceeded NYSDEC soil cleanup objective. Comparison to soil cleanup objectives is not the appropriate metric. A more relevant benchmark is sediment quality guidelines (e.g., NYSDEC 1999) because a rise in water elevation and an increase potential for flooding of these areas would contribute to erosion of or submersion of these soils. A comparison to sediment benchmarks will modify the number of contaminants in excess of criteria. MED plans on removing any contamination under a to be

developed soil management plan. Removal should be based on targeting soils above sediment benchmarks.

Section 3.11 Fish Passage

FERC's February 17, 2009 determination on study modifications directed MED to produce conceptual design drawings, a cost estimate, specifications, and information on passage effectiveness for a fish elevator for fish species of interest (i.e., lake sturgeon, muskellunge, pacific salmon, American eel, walleye) at projects similar to the proposed Massena-Grasse River Project. Based on this input, MED prepared conceptual designs for an American eel upstream passage, spiral ramp fish passage, and downstream fish passage to address target species. MED did not locate any studies quantifying the effectiveness of elevators for fish passage.

The weight of evidence demonstrating the relative efficacy of elevators to pass fish on a newly constructed dam was not provided because only qualitative successful passage information was reported. Although the examples provided from the literature record passage of hundreds to thousands of fish at particular dams, that information does not allow for the determination of the number of fish that were passed relative to the number that were blocked from upstream migration. The authors also do not identify whether these projects represent newly constructed dams where fish elevators were installed for passage as part of the original design or whether they are all retrofits of pre-existing conducted as part of relicensing requirements.

Further, Kynard (1997) and Moser and Ross (1995), in NMFS (1998), suggest that shortnose sturgeon in the pre-spawning adult age class may migrate upstream before fish lifts or locks are in operation. Analysis of fish elevators or locks for passage must include discussions and studies determining the full migration period of lake sturgeon and other fish species and assessing whether the lifts or locks could operate successfully during the required periods.

Construction of the proposed MED dam will create a significant impediment to fish passage. All of the passage options discussed in the Updated Study Report improve passage on pre-existing dams but provide less than full passage on free flowing waterbodies negatively impacted by new dam const such as the proposed project on the Grasse River. No data is provided demonstrating a high level of usage and successful passage (i.e., comparable to 100% pre-construction passage) with a fish elevator or spiral ramps by a wide variety of fish species and life stages. In fact, no information was presented that suggests that either the fish elevator or the spiral ramp will meet the needs of target and non-target species (e.g., surface vs. bottom swimmers, different swimming abilities) or their different life stages. The document would therefore benefit from a discussion about whether the dam could accommodate an upstream eel ladder, spiral ramp, a fish elevator and downstream passage. Moreover, the basis of eel ladder conceptual design was the St. Lawrence-FDR eel ladder. While installation of the St Lawrence FDR eel ladder doubled eel passage, tagging studies documented about an 85% success rate (McGrath and Tatham 2006). A ladder of this design on the Grasse River would reduce eel passage by about 15%.

According to the Updated Study Report, juvenile sturgeon were recorded moving up to 8 km within the Grasse River including traveling back and forth past the breached weir and proposed dam location. This suggests that any fish passage needs to accommodate movement of both juvenile and adult sturgeon. Fish passage design studies should be developed to assess the

ability of juvenile sturgeon to use and survive proposed passage types, such as lift elevators and spiral ramps. Flow studies should be designed for different life history stages of target species over a full range of candidate flows consistent with FERC's guidelines for preparing Exhibit E. The studies conducted to date do not appear sufficient to meet these future requirements.

Egg trap data confirmed that walleye spawned in the riffle area. Chinook salmon were present in spawning condition in the river and one young of year salmon was collected. American eels and muskellunge were found in the Grasse River.

Specific Comments

Section 1.1, Para 2 and 3: The project description section should provide the heights of the breached weir (~3') and the proposed dam (~26') and note that fish appeared to be able to pass upstream of the weir during some levels of flow (NYSDOS 1994).

Section 3.15: Muskellunge spawn in spring (water 47-52°F) in water 15 to 20 inches deep over several substrate types including those high in sand, silt and organic content. They utilize a variety of heavily vegetated, flooded areas. These include areas of new submerged and emergent vegetation although preferential selection was not observed. Nests are not built, instead semi-demersal, non-adhesive eggs are scattered in vegetation. Upon hatching, young remain dormant in vegetation for about 10 days. Their habit of spawning on floodplains is a limiting factor as a decrease in water level may expose developing eggs, strand or kill spawners, or young. Nursery areas contain a mix of submerged and emergent vegetation including wild celery (*Vallisneria americana*), coontail (*Ceratophyllum demersum)*, bulrushes (*Scirpus* sp.), muskgrass (*Chara vulgaris)*, common waterweed (*Elodea canadensis*) and water milfoil (*Myriophyllum*) (Scott and Crossman 1973, Smith 1985, Farrell et al. 2003). According to NYSDOS (1994), the Grasse River muskellunge population is the only population inhabiting a small river in the St. Lawrence Plan and possibly serves as a rare refugium and was one of the criteria used to support designating the Grasse River as Significant Coastal Fish and Wildlife Habitat.

Section 4.4.1: A description of flood gate operations should be presented in the report to allow for an evaluation of the potential impacts to fish passage.

Section 3.12 Floodplain/Ice Management Studies

FERC, in its Feb 2009 letter to MED required numerous modifications to address all study goals of the approved plan because it did not provide enough detail regarding the evaluation of ice-induced shoreline erosion.. These included historical documentation of any anchor ice, potential for anchor ice development on the Grasse River, potential for grounded ice jams to occur in the entire length of the proposed impoundment; and available supporting documentation pertaining to historical meltwater processes on the Grasse River (e.g., duration of melting periods) to supports a conclusion during and after ice breakup that flow conditions downstream of the dam will not be significantly altered. Supporting studies and or materials were requested to address the effects of the project on various remediation alternatives for the downstream Alcoa PCB site. In addition, ice-induced shoreline erosion analysis beyond qualitative statements was required to help inform a decision regarding the need for shoreline protection, the level of protection needed, and the extent of shoreline in need of protection.

The proposed trapping efficiency of the proposed reservoir is 16% over 50-years based on modeling but was 37% using the Churchill method. Would MED design the project differently assuming the higher trapping efficiency? What impacts would the higher trapping efficiency have on downstream transport of solids and the potential change in sediment dynamics in the lower Grasse? Has an additional volume of reservoir storage equal to the anticipated sediment deposition been built into the project design and has the model accounted for the cumulative decrease in bottom elevation, raising water stage and increased potential for flooding? Do the heights of the water retention structures and estimates of extent of inundation take into account the decrease in river bottom elevation over time?

The prohibition against any increase in the base flood elevation is part of the minimum requirements set forth in the National Flood Insurance Program (NFIP) regulations (44 C.F.R. § 60.3(d)(3)). The analysis presented assessing potential changes to flood hazard classification from dam construction seems to be based on HEC-RAS modeling and does not appear to account for the additional inundation from potential changes in the water table and ice meltwater. Impacts to flood hazard classifications should be re-evaluated once groundwater modeling has been completed.

Specific Comments

Page 30, "*The proposed MED project can effectively serve as an ice control structure for the design event cases evaluated*": Documentation has not been provided demonstrating the need for long-term ice management to prevent ice jams in the Lower Grasse River. The sole purpose appears to be management of contaminated sediments associated with the Alcoa West facility. Remediation of these contaminated sediments is being pursued independently through the USEPA Superfund process and should not be a goal of dam construction.

Additional figures should be presented showing the contours of open water and ice inundation and the structures within those contours.

Section 3.15 Shoreline Erosion and Sediment Transport

FERC, in its Feb 2009 letter to MED required an assessment of the need for a shoreline protection plan and of the effect of sediment load reduction on downstream areas in its Preliminary Licensing Plan (PLP).

The sediment transport model requires input of grain size, incoming sediment load, and erosion potential of river sediments. Grain-size data was generally lacking for the impoundment area (see specific comments, below), the incoming sediment load was estimated from the solids rating curve and composition for the lower Grasse, and the erosion potential was estimated from the lower Grasse River. As a consequence, sensitivity analysis was conducted on each of these parameters and the sediment transport model was most sensitive to the incoming sediment load. NOAA recommends collection of data to validate the estimates used to parameterize the model, in particular the upstream boundary sediment load.

The modeling effort doesn't appear to consider the distribution or current effect of debris on sediment transport and shoreline erosion and how dam construction will alter the distribution and quantity of debris in the river and its effect on sediment dynamics. Consideration should be given to updating model runs to account for this potential confounding factor.

Hardening of the shoreline will be a consequence of dam construction, e.g., placement of riprap to reduce ice-induced erosion, construction of water retention structures. This will alter flow and sediment deposition and erosion patterns. Please clarify whether the model accounts for these changes?

Specific Comments

QEA Anchor's presentation indicated that RM 8.4 to RM 14 are characterized as net depositional or in dynamic equilibrium due to the presence of areas of silty substrate. This approach appears to ignore the presence of large areas of sand in the upper 7 miles of the impoundment.

Page 8, Section 2.1: Model bathymetry is based on 13 transects between RM 9.5 and RM 15 and 9 transects between RM 7 and RM 8. This approach provides for more detailed bathymetric information in the lower one mile of the impoundment. A finer resolution survey should be conducted in the upper 7 miles of the impoundment using multibeam bathymetry.

Page 9, Suspended Solids Data, "*The solids rating curve used in this study was developed using suspended solids measurements collected from the Main Street Bridge between 1997 and 2007.*": This curve may overestimate the suspended solids during this 10-year period due to the breach in the weir in 1997 and the release of sediments accumulated behind the weir.

Page 10, Sediment Grain Size Information, "*There is no available grain size information for the proposed reservoir area with the exception of a habitat study (Normandeau, 2007) that is useful for the general classification of different areas but not for the quantification of the sediment parameters used in the modeling study. Therefore, sediment class definitions were obtained from the existing modeling effort for the lower Grasse River (Alcoa, 2002).*" A study should be performed to characterize sediment grain size information within the proposed area to populate the sediment model study. This is important in more accurately projecting how the substrate changes from present condition (only qualitative knowledge) to future conditions with the construction of the dam. This is critical to evaluating the potential shift in ecological habitat that supports aquatic vegetation, freshwater mussels and various species of fish.

Page 18, Section 3.1.1, "*Upstream of RM 14.0, sedimentation rates are higher (with a maximum of 0.77 cm/yr). The higher sedimentation rates upstream of RM 14.0 are likely due to the limited bathymetric information available in and around the bends of the river that exist in this reach*": These results suggest that additional bathymetric data should be collected in this stretch of the river and the model rerun.

Page 23, Section 3.1.2, "*The trapping efficiency obtained with the Brune method is 30 percent for coarse sediment and 0 percent for fine sediment, with the actual value for the Grasse River lying somewhere in between. The Churchill method yields an overall trapping efficiency of 37 percent. Despite the approximate nature of these calculations (relative to the site-specific*

reservoir model), the results are not inconsistent with the reservoir model predictions (i.e., about 23%)."and Page 22, Section 3.1.3, "The overall trapping efficiency for the 50-year simulation is 16%, which, as expected, is lower than the previously predicted trapping efficiency running the model with only deposition." The proposed 50-year trapping efficiency is significantly lower than calculated using the Churchill method. Please explain this potential discrepancy and what impact an underestimate in trapping efficiency has on sediment transport model results. Would trapping efficiency decrease or increase beyond the 50-year time frame and how would that affect the modeling of the 100-year flood condition and the 100-year ice condition? How much of the total capacity of the reservoir will be reduced over a 100-year period?

Section 3.17 Groundwater

FERC, in its Feb 2009 letter to MED directed them to conduct a new groundwater study that would consist of collection of detailed topographic information, field information of current groundwater elevations and flows, potentially affected properties, underground storage tanks to assure tanks are properly anchored if groundwater elevations rise, and ground-water modeling to determine changes in the groundwater hydrology caused by the project. FERC also asked MED to summary of the limitations of the topographic data relative to accuracy and its affect on study results and to provide this as part of the PLP.

The groundwater study presented in the Updated Study Report lacks a description of the underground storage tanks and ground-water modeling required by FERC and an inadequate description of groundwater elevation and flow (see specific comments, below). Similar, a figure should be included that clearly highlights the properties and structures that would be potentially affected by elevated groundwater associated with dam construction. This work should be conducted in 2010 and provided in a supplemental study report.

<u>Specific Comments</u>

Section 3.1, Para 2, "*project would be conservatively designed to protect against the highest elevation for all cases studied rather than individual ice events.*": Text suggests that the project is not conservatively designed since it does not account for the added height from ice accumulation.

Section 3.2: Subsurface investigations (borings, test pits) were performed in June, July and September to investigation groundwater elevation. Groundwater elevations should be evaluated seasonally to ensure that maximum elevations levels are determined.

Section 3.3, General groundwater trends, "*Both the bedrock and glacial till are expected to have relatively low permeability, limiting the groundwater flow into the river to relatively low rates.*": The document should provide support for this statement. In addition, it should address inconsistencies between the boring logs and test pits results and the text. The laboratory sheets suggest the presence of a mixture of clay, sand, silt, gravel, and cobble below the top soil/organic material horizon, not all borings/test pits identify the presence of glacial till.

Section 3.3, Groundwater flow rates, "*Groundwater flow into the river just downstream of the proposed dam was estimated by CDM (2001).*": Groundwater flow rates should be measured upstream of the proposed dam due to differences in the river gradient and bottom type.

Section 4.1: The Updated Study Report would benefit from a discussion of the strength of the retaining wall relative to the added water pressure from overland flow and an elevated water table landward and elevated water elevations and ice on the river side. The report also warrants more specifics on the capacity of the drains to handle groundwater and overland flow to the river and the maintenance requirements of such a system. MED should also consult with the state on whether permits are required for this discharge and whether their design satisfies permit requirements.

Section 4.2, Para 1: "*The duration of the 100-yr ice related flood events is on the order of 24 to 48 hours.*": The basis for this statement should be provided.

Section 5, Para 4: "*In these areas [Water Street and Tamarack Street], the groundwater level would not be expected to change significantly from current conditions.*": This appears to be subjective and not supported by sound scientific analysis since groundwater modeling was not conducted.

Miscellaneous Comments

MED in a November 17, 2009 letter to FERC summarizing an Oct 2009 stakeholder meeting, reiterated its proposal for engaging stakeholders in working toward a collaborative drafting of the Preliminary Licensing Plan (PLP). NOAA's Office of Response and Restoration plans to continue to participate in the pre-licensing process but does not envision collaborating on the drafting of the PLP.

Shape files used in preparing the figures in the 2006-2009 Study Reports depicting sampling locations, inundation contours, SAV beds, fringing wetlands, backwater areas, floodplains, mussel beds, water retention walls, impoundment footprint, etc. should be provided.

If you have any questions, I can be reached at 212-637-3259 or lisa.rosman@noaa.gov

Sincerely,

Lisa Rosman
NOAA Regional Resource Coordinator
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References

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