Appendix E

Methods and Regulations

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Appendix E

Environmental Review Methods and Regulations

The project has not yet entered preliminary design or engineering. Therefore, impact calculations for all resources were based upon the following **assumptions**:

The Applicant employed the following assumptions throughout Section 6.0 to estimate impacts:

- The Route Alternatives (Route Area) and Segment Options are 1,000 feet to 3,000 feet wide, depending on proximity to existing transmission lines. See Appendix A for detailed figures.
- The Study Area, for the existing conditions discussion, includes all Route Alternatives and Segment Options. As appropriate, the Study Area for existing conditions extends beyond 3,000 feet.
- The anticipated right-of-way (ROW) for the Route Alternatives and Segment Options is assumed to be 200 feet wide, as depicted in Appendix A. The calculation of environmental impacts is described for the anticipated ROW for each Route Alternative and Segment Option.
- Average structure spacing distance is assumed to be 1,000 feet for purposes of calculating environmental impacts. When constructed, structure spacing is anticipated to be between 1,000 feet and 1,400 feet.
- Permanent land cover impacts are assumed to be 1,936 square feet per structure for self-supporting suspension towers, which includes the area covered by the base of each structure and a 2-foot buffer, as depicted in Appendix D.
- Permanent foundation impacts are assumed to be 60 square feet per structure for self-supporting towers and 33 square feet per structure for guyed-V and guyed-Delta towers; this is the area of fill required for the foundations, as depicted in Appendix D. Foundation impacts in floodplains may differ depending structure footing design requirements.
- It is assumed that guyed-V or guyed-Delta towers will be used in wetlands; permanent wetland fill impacts are assumed to be 33 square feet per structure. This estimate is based on the assumption that the tower foundation will include a circular concrete cap with a diameter of 6 feet, and four guy wires will each require a 1-foot-diameter circular anchor.
- ROW impacts were calculated for an anticipated centerline, which generally was assumed to be in the center of the Route Alternative or adjacent to existing infrastructure located within the Route Alternative. The anticipated centerline was developed using digital GIS data. The actual centerline will be identified during final design, and could be moved based on design requirements or to avoid or minimize affecting resources within or near the ROW.
- Temporary impacts are assumed to be 22,650 square feet (0.52 acres) per structure (self supporting, guyed-V and guyed-Delta); this assumes an area of approximately 150 feet

by 150 feet and will provide adequate space for lay-down and construction of each structure.

- Temporary impacts are assumed to include an access path within the ROW that is 16 feet wide for construction.
- Permanent clearing – the entire anticipated 200-foot-wide ROW is assumed to be cleared of forested vegetation.
- Permanent clearing – a 70-foot-wide corridor centered on the anticipated centerline is assumed to be cleared of shrubby wetland vegetation. In some areas, shrubs may be allowed to grow within the ROW if they would not pose a safety or operations hazard; thus, the entire ROW may not need to be cleared.
- Permanent impacts for the combined Blackberry 500 kV Substation and 500 kV Series Compensation Station would be 25.0 acres. Since the final location of the 500 kV Series Compensation Station will not be known until final route selection, the facility was assumed to be collocated with the Blackberry 500 kV Substation for the purpose of developing meaningful impact calculations.
- It is assumed that there will be no grading or filling for permanent access; the Project may have a '2-track' access path running the length of the transmission line.

The following sections summarize the sources, methods and calculations for each environmental issue discussed in Section 6.0 Affected Environment and Environmental Consequences.

6.1 Geomorphic and Physiographic Environment

Information on geology and topography from the Minnesota Department of Natural Resources (DNR), Minnesota Geological Survey, and US Geological Survey (USGS) was analyzed to determine the Study Area's existing conditions and potential effects on those conditions.

There are no state or federal regulations for impacts to geology and topography.

6.2 Soils

Electronic soils data were obtained from the Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database. Temporary impacts were assumed to occur within the entire 200-foot-wide anticipated ROW.

There are no state or federal regulations for impacts to soils. Prime farmland regulations are included under section 6.23, Agricultural Production. Erosion and sediment control regulations are included under section 6.17, Water Resources.

6.3 Climate

Information on climate was analyzed to determine the Study Area's existing conditions and the Project's potential effects on the existing conditions.

There are no state or federal regulations for impacts to climate.

6.4 Vegetation

Species information was identified primarily using species records and ranges that have been compiled by the Minnesota DNR and U.S. Fish and Wildlife Service (USFWS). Vegetation was classified using the Minnesota DNR Ecological Subsection Types, Geographic Analysis Program (GAP) Level 2 landcover types in the Existing Conditions section. GAP Level 4 landcover type was used to analyze general vegetation impacts in the Direct and Indirect Effects section. GAP Level 1 landcover type was used to analyze fragmentation impacts. GAP Level 2 landcover type was used to analyze impacts within Wildlife Management Areas. Ecologically Important Lowland Conifer data was obtained directly from the Minnesota DNR.

As indicated in the assumptions listed at the beginning of this appendix, forested vegetation was assumed to be permanently cleared within the 200-foot-wide anticipated ROW. Wetland shrub vegetation was assumed to be permanently cleared within a 70-foot-wide corridor beneath the conductors. All other vegetation impacts within the anticipated ROW would be temporary.

There are no state or federal regulations for impacts to vegetation. Regulations for sensitive species (that is, threatened and endangered species) are included in section 6.20 Rare and Unique Species and Communities.

6.5 Human Settlement

Population densities within the Study Area were obtained from the U.S. Census Bureau American Community Survey (ACS) 5-Year Estimates.

Residences within the Route Alternatives and Segment Options were identified through field identification, review of high resolution aerial photographs, and public comment. Using a Geographical Information System (GIS), potential impacts to residences and structures within the anticipated 200-foot-wide ROW and within the up to 1,000 to 3,000-foot-wide routes were counted.

There are no state or federal regulations for impacts to human settlement. Regulations related to environmental justice are include in that section, that is section 6.7 Environmental Justice.

6.6 Land Use

Zoning and land use information was gathered from county websites and official Comprehensive or Land Use Plans. Public land use type was identified using digital GIS data obtained from the Minnesota DNR, USFWS, and counties.

Land cover was identified using the National Land Cover Dataset (NLCD). Acreages within the Route and ROW for each Route Alternative and Route Segment were analyzed in this section.

As indicated in the assumptions, above, permanent impacts were based on a permanent structure footprint of 33 square feet per structure assuming a 1,000-foot span distance between structures for emergent herbaceous wetlands. Permanent impacts for commercial/industrial/transportation, pasture/hay, row crops, shrubland, small grains, and transitional were based on a permanent structure footprint of 44 square feet, assuming a 1,000-

foot span distance between structures. Permanent impacts for deciduous forest, evergreen forest, mixed forest, and woody wetlands were assumed to be the entire width of the ROW (200-feet) multiplied by the distance of the proposed ROW through those landcover types.

Temporary impacts were based on a temporary disturbance footprint of 0.52 acre per structure assuming a 1,000-foot wide span distance between structures and assuming a 16-foot-wide construction access path the length of the ROW. Temporary impacts were assumed to occur for all land cover types except forested and woody wetland cover types, where the entire impact was assumed to be permanent.

Zoning codes, administered by the local governments, regulate land use. However, per Minnesota Statute 216E.10, a Route Permit issued for high-voltage transmission line purposes,

> "…shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt all zoning, building, or land use rules, regulations, ordinances promulgated by regional, county, local and special purpose government."

6.7 Environmental Justice

U.S. Census Bureau, 2008-2012 ACS 5-Year Estimates data was used to gather statistics on race, ethnicity, average income, poverty, and Limited English Proficiency (LEP) within census block tracts in the Study Area.

The region of comparison (ROC) is a summation of all 12 census block tracts in the Study Area. Minority Population data was gathered from the "Race alone or in combination with one or more other races" section of the 2008-2012 ACS Demographic and Housing Estimates. "Total and Percent Minority" is a summation of Black or African American, American Indian and Alaska Native, and Asian/Native Hawaiian & Pacific Islander/Other categories. Hispanic and Latino are also considered. Hispanic is an ethnic classification rather than a racial one in the U.S. Census and is treated as such in this document.

Poverty Level and Household Income data was taken from the "Median household income" and "Percentage of families and people whose income in the past 12 months is below the poverty level – All people" section of targeted ACS estimates.

LEP data was taken from "Language spoken at home: Population 5 years and over and Speak English less than 'very well'" categories of ACS' Selected Social Characteristics in the United States.

6.8 Socioeconomic Factors

Socioeconomic data were gathered from the U.S. Census Bureau 2008-2012 ACS Estimates and was supplemented by an Economic Report by the University of Minnesota-Duluth Labovitz School of Business and Economics.

Unemployment rates were gathered from ACS Selected Economic Characteristics Estimates, specifically, "Employment Status: In labor force – unemployed" and "Industry."

There are no state or federal regulations for impacts to socioeconomic factors.

6.9 Cultural Values

The main sources for information for this section came from analysis of comments stored in the iRealm Contact & Comment Management (CCM) System maintained by HDR for the Project. Information on individual counties came from Dante Chinni's and James Gimpel's 2010 book, *Our Patchwork Nation: The Surprising Truth about the "Real" America,* published by Gotham Books, New York. General information on geographic cultural differences came from Collin Woodard's 2012 book, *American Nations: A History of the Eleven Rival Regional Cultures of North America*, published by Penguin Books.

There are no state or federal regulations for impacts to cultural values.

6.10 Aesthetics

GIS information from the Minnesota DNR was used to identify characteristics of the natural landscape. For residence/structure and transportation methods, see Sections 6.5 and 6.22 of this Appendix. The aesthetics review considered potential vantage areas such as road crossings or paralleling areas, landscape and viewsheds based on aerial photos and land cover maps, resident locations and possible views of the line, water features, and other potential vantage points such as trails, campgrounds, or park and associated recreation facilities.

There are no state or federal regulations for impacts to cultural values.

6.11 Noise

Existing noise levels in the project area were estimated using methods contained in American National Standards Institute (ANSI) acoustical standard ANSI S12.9 Part 3 2008 (American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, Part 3: Short-Term Measurements with an Observer Present. Estimates of noise emissions from transformers at the substation are based on National Electrical Manufacturers' Association (NEMA) ratings. Transformer noise was propagated to the nearest home using the commercially available noise modeling software Cadna-A, by DataKustic. Modeling results were compared with Minnesota Pollution Control Noise Standards (MN Rules 7030).

There are no federal regulations applicable to noise standards.

6.12 Air Quality

National and Minnesota Ambient Air Quality Standards were reviewed to describe the Study Area's existing air quality conditions in terms of attainment and nonattainment with those standards for each county affected by the Project. Project's potential effects on the existing conditions were qualitatively analyzed.

There are no state or federal regulations requiring any kind of air quality permit for the transmission line. Any emissions from the transmission line would be fugitive; as such, no permits would be required.

6.13 Public Services & Utility Systems

ESRI GIS data was used to identify the locations of hospitals within the Study Area. GIS data from the Minnesota Geospatial Information Office was used to identify and map gas pipelines and electric transmission lines within the Study Area. Using GIS, areas where any Route Alternative or Segment Option paralleled existing gas pipelines or electric transmission lines was measured.

There are no state or federal regulations for impacts to public services and utility systems.

6.14 Radio, Television, and Cellular Telephone

Communication Tower data was obtained from the Federal Communications Commission (FCC). Tower location data were analyzed against the Route locations in GIS to determine which towers may be located within the routes. Distances were calculated using GIS.

There are no state or federal regulations for impacts to radio, television and cellular telephone services.

6.15 Electric and Magnetic Fields

Information about electric and magnetic fields was obtained from state and federal internet web sites and from the Applicants. Census data and aerial photographs were used to identify proximity to residences.

There are no state or federal regulations for impacts regarding electric and magnetic fields.

6.15 Archaeological and Historical Resources

Information on known cultural resources within the Study Area was gathered from the Minnesota State Historic Preservation Office (SHPO) in St. Paul, Minnesota, and the Office of the State Archaeologist (OSA), and incorporated into GIS. Maps were generated and spatial relationships compared between the routes, topographical features, and recorded resource locations. The individual route data presented in Section 6.16 generally reflects resources within the route. For the overall Study Area, a 2-mile wide corridor was considered. The data used were as current as possible for this study, and reflect information available on cultural resources within the routes as provided by SHPO.

Procedures from the *State Archaeologist's Manual For Archaeological Projects In Minnesota* (Anfinson 2011) and *SHPO Manual For Archaeological Projects In Minnesota* (Anfinson 2005) were followed for the Cultural Resources Literature Search. State regulations that apply to this project include the Minnesota Field Archaeology Act of 1963 (MN Statutes 138.40), the review of state agency projects which may affect sites listed on the State or National Register of Historic Places under the Minnesota Historic Sites Act (MN Statutes 138.665, Subd.2), the Minnesota Private Cemeteries Act (MS 307.08), Minnesota Historic Sites Act (MS 138.661-138.669), Minnesota Environmental Rights Act (MS 116B.02). Federal regulations that may be applicable include: National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.), National Environmental Policy Act of 1969, as amended (42 USC 4321, and 4331 - 4335), Archaeological and Historic Preservation Act of 1974, as amended (16 USC 469-469c-2), American Indian

Religious Freedom Act of 1978, as amended (42 USC 1996 and 1996a), Archeological Resources Protection Act of 1979, as amended (16 USC 470aa-mm), Abandoned Shipwrecks Act of 1987 (43 U.S.C. 2101-2106), Native American Graves Protection and Repatriation Act of 1990, as amended, (25 USC 3001 et seq.).

6.16 Water Resources and Floodplains

Spatial GIS coverage of ecological subsections, Public Water Inventory (PWI) basins, PWI watercourses and peatlands was obtained from the Minnesota DNR. Information on groundwater resources was obtained from the Minnesota Department of Health County Well Index, Minnesota Geological Survey and Minnesota Pollution Control Agency (MPCA). Information on ecological When available spatial GIS coverage representing flood data derived from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), were used to identify portions of the Study Area that fall within the 100-year floodplain. However, GIS coverage of Koochiching County was not available. In instances where floodplains are present within the Study Area in Koochiching County, flood data derived from FEMAs Map Service Center was used along with LiDAR 1 meter digital elevation data to develop GIS coverage of these areas.

As identified in the assumptions above, permanent impact calculations were based on an average spacing of 1,000 feet between structures, and permanent impacts associated with each transmission structure was anticipated to be 33 square feet.

Public waters in Minnesota, that is PWI basins and watercourses, have significant recreational or natural resource value as defined in Minn. Stat. 103G.005. The Minnesota DNR has regulatory jurisdiction over these waters. The MPCA has regulatory authority to maintain a list of impaired waters under Section 303(d) of the Clean Water Act. In addition, Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) permit program, which regulates sediment transport, erosion control, and other pollutant runoff into waters of the state. The local governments have regulatory authority over floodplains; however, their authority does not extend to construction of transmission line as regulated by the Minnesota Public Utilities Commission (PUC). The DNR has regulatory jurisdiction over water withdrawals from both groundwater and surface water sources. The Minnesota Department of Health has regulatory jurisdiction over water well construction and abandonment.

6.17 Wetlands

The wetland evaluation was based on National Wetland Inventory (NWI) data available from the USFWS. These data provide a general estimate of wetlands that may be present in the Study Area. Most often the NWI underestimates the number and size of wetlands present. However, the relative impact estimates using NWI data are adequate for this level of evaluation. More detailed wetland field surveys would be conducted once a route is selected.

The area of permanent impact is anticipated to be 33 square feet per structure in wetland areas. Permanent impacts only will occur if a wetland cannot be spanned. An estimate of the amount

of wetlands that will need to be filled was calculated by assuming 1,000 feet between structures and determining, based on percent of centerlines in wetlands, the number of wetland structures and associated fill.

Conversion of forested wetlands (PFO type) was determined by calculating the length of centerline crossing forested wetland polygons and multiplying by a 200-foot width. Calculations slightly differ from area calculations above based on use of length as the basis for analysis rather than area calculations.

Calculation of the conversion of shrub wetlands was determined by assuming a 70-foot-wide cleared corridor between structures under the center line. The percentage of wetland types crossed by the centerline was divided by the total number of structures. Calculations slightly differ from area calculations above based on use of length rather than ROW acres as the basis of calculations.

Wetlands are defined by the United States Army Corps of Engineers (USACE) as "Waters of the US" and are subject to jurisdiction under Section 404 of the Clean Water Act (1973). Waters of the US include both wetlands and non-wetlands that meet USACE criteria. In Minnesota, all wetlands are also regulated by a local government unit (LGU) under the Wetland Conservation Act (Minn. Rules Ch. 8420). The Minnesota DNR under Chapter 6115, Public Water Resources regulates PWI wetland basins. Projects that propose to fill jurisdictional wetlands must be permitted by USACE, local government unit (LGU) and/or the Minnesota DNR.

6.18 Wildlife

The analysis of effects to wildlife was based on species information compiled by the Minnesota DNR in Tomorrow's Habitat for the Wild & Rare an Action Plan for Minnesota Wildlife. Species' ranges and habitat impacts were analyzed using the proposed routes plus a 200-foot-wide corridor and the Minnesota DNR Ecological Subsection Types, Geographic Analysis Program (GAP) Level 2 landcover types in the Existing Conditions section. Habitats and landcover types provided a basis for species affected by the anticipated ROW. Habitat types and patch size was used to develop potential impacts to wildlife species associated with applicable habitat types and the effect of fragmentation or maintenance on a specific species group (i.e. forest, prairie, wetland, etc.).

Affects were based upon the assumptions listed at the beginning of this appendix. Forested vegetation was assumed to be permanently cleared within the 200-foot-wide anticipated ROW. Wetland shrub vegetation was assumed to be permanently cleared within a 70-foot-wide corridor beneath the conductors. All other vegetation impacts within the anticipated ROW are considered temporary or would be maintained in low stature vegetation that wouldn't change wildlife use of these habitat types.

Two types of permit compliance activities are being used to avoid or reduce impacts to wildlife: pre-construction consultation with agencies and assessing existing wildlife resources through pre-construction surveys. These compliance activities serve to identify the types and extent of wildlife present within and adjacent to the project. This information will inform project infrastructure siting and the extent of ongoing surveys to comply with regulatory programs

such as the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA).

6.19 Rare and Unique Species and Communities

The Study Area for rare and unique species and communities includes the proposed routes plus a one mile wide buffer. Since the routes have not undergone detailed field studies the Study Area for this analysis is wider than the routes to provide a comprehensive evaluation of the species that may be located within the routes. Therefore, the species identified within the larger Study Area may or may not be found within the individual routes. Detailed field studies for rare and unique species and communities would be conducted for the preferred route.

Rare and unique resources were identified using the Minnesota DNR Natural Heritage Information System (NHIS). Scientific and Natural Areas (SNAs) were also identified near the Study Area.

The federal government and Minnesota both have regulations specific to threatened and endangered species. The following is a summary of the four jurisdictions that identify the species considered in this analysis.

Federally-listed Threatened, Endangered, and Candidate Species

The ESA of 1973, as amended (Pub. L. 93-205), provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Section 7 of the ESA requires federal agencies to insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.

While the bald eagle has been recently delisted from the ESA, the bald eagle is still protected by other federal laws. MBTA (16 U.S.C. 703-712) regulates the taking, selling, transporting, and importing of migratory birds, their nests, eggs, parts, or products. BGEPA (16 U.S.C. 668-668c) makes it illegal to kill, harass, possess (without a permit), or sell bald eagles.

State-listed Species and Rare Natural Features

Minnesota's endangered species law (Minn. Stat. § 84.0895) and associated rules govern the taking (including killing, capturing, collecting, and/or possessing) of state endangered or threatened species. Species identified as of special concern are not legally protected. The Minnesota DNR is responsible for overseeing the regulations and permitting for development projects.

6.20 Noxious Weeds and Exotic Organisms

Noxious and Invasive Weed information was gathered from the Minnesota Department of Agriculture's (MDA) most current list of Noxious and Invasive Weeds. Prohibited Noxious Weds includes those on the Eradicate, Control, Restricted, a Specially Regulated Plants lists. Specific weed occurrence data was obtained from the MDA Integrated Pest Management Project – Early Detection and Distribution Mapping System for Roseau, Lake of the Woods, Beltrami, Koochiching, and Itasca counties.

Additional data from the Minnesota DNR's prohibited invasive species was included in this section.

The Minnesota Noxious Weed Law (Minn. Stat. §§ 18.76 to 18.88) regulates noxious weeds that are deemed by the Commissioner of Agriculture to be "injurious to public health, the environment, public roads, crops, livestock, and other property."

The law gives county agricultural inspectors and local weed inspectors the authority to inspect land and ask landowners to destroy noxious weeds (Minn. Stat. § 18.78 subd. 1). Selling noxious weeds without a permit; transporting noxious weeds along a public highway without a permit; hindering weed inspectors; and failing to comply with weed inspector notices to eradicate noxious weeds are all considered misdemeanors (Minn. Stat. §§ 18.86 and 18.87).

6.20 Recreation and Tourism

The Minnesota DNR's Recreation Compass and digital GIS data obtained was used to locate federal and state recreational areas, lakes, water access points, hunting areas, and trails. County web sites were searched to identify local recreation and tourist destinations.

There are no state or federal regulations for impacts to recreation and tourism.

6.21 Agricultural Production

The U.S. Department of Agriculture's (USDA) Agricultural Census data was used to provide context to the agricultural setting within the Study Area. NLCD data was used to quantify acreages of certain agricultural land cover types across the Study Area. SSURGO data was used to quantify acreages of prime farmland. GIS was used to determine temporary and permanent impacts to land cover types and prime farmland.

Impacts were calculated as identified in the assumptions, above. Agricultural land in this section is the summation of pasture/hay, row crops, and small grains land cover data from Section 6.6 Land Use. Permanent impacts were 1,936 square feet per structure, since this is the area that would be taken out of agricultural production.

The Natural Resource Conservation Service documents impacts to Prime Farmland using Form AD-1026. No other state or federal regulations apply to agricultural production.

6.22 Transportation

Roads, airports, and railroads were identified within the Study Area using GIS analysis available from Minnesota Department of Transportation (DOT). Annual average daily traffic (AADT) volumes on trunk highways were assessed using Traffic Forecasting & analysis tables. Future transportation plans were identified in consultation with MN/DOT planners in District 1 and 2. Airport data was obtained from the Federal Aviation Administration (FAA).

Minnesota DOT requires a permit to cross state highways. For airports with one runway greater than 3,200 feet in actual length, the FAA Federal Aviation Regulations (FAR) Part 77 obstruction guidelines specify that notice must be submitted to FAA for developments greater than 150 feet, the maximum height of the horizontal plane above the established airport elevation (FAA 14

CFR 77.7). The Route Alternatives have been located outside of the identified flight zones, but confirmation of impact avoidance with airport officials will be required.

6.23 Forestry

The information for the Forestry section was from two main sources. The land cover for forest cover was calculated from the 1993 GAP data (Level 1). The timber resource data was gleaned from a number of Minnesota DNR publications; Subsection Forest Resources Management Plans (SFRMP) and a series called "Tomorrow's Habitat: An Action Plan for Minnesota Wildlife". The location of public and private/corporate forest land was obtained county tax assessment data.

There are no state or federal regulations for forest impacts.

6.24 Mining

Information on the mining resources within the Study Area was obtained from Minnesota DOT, Minnesota DNR, and the USGS. Areas of past and present metallic and industrial mineral mining activity were identified within the Study Area using GIS analysis, and verified with 2013 aerial photography. Information about aggregate mining operations from the Minnesota DOT and the Minnesota DNR, Division of Lands and Minerals was analyzed to determine the Study Area's existing conditions and potential effects on those conditions. Information from state agencies was supplemented with information from the Minnesota 2009 Minerals Yearbook published by the USGS.

Aggregate mining in Minnesota is generally under the jurisdiction of the local government, with potential specific regulations by the township, city, and/or county in which the operation is located.

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