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MEMORANDUM

TO: Vantage Bay Development Team

FROM: Lawrence E. Riegert PE

DATE: May 24, 2006

SUBJECT: Vantage Bay development status

Dear project team,

This project involves evaluation of options to serve 310 new residential units in the service area of Kittitas Water District #6. The District's treatment plant has a peak month design capacity of 0.087 mgd. However, actual capacity is less than that due to extreme peak weekend flows in the summer and associated inefficient clarifier design.

Currently, it is anticipated that the typical dwelling unit will include a three-bedroom, two bath, and patio style residences. We understand that many of the residences may be second homes. The percentage of permanent residences is unknown, at present, but may be as low as 10 to 20%. This will be a private gated facility. We understand that there may be some kind of clubhouse associated with this project.

We are currently investigating three options for wastewater management for the proposed Vantage Bay development as follows:

1. Flow equalization, as discussed below.
2. Upgrading the facilities at the existing wastewater treatment plant site.
3. Construction of a new satellite facility south of the freeway, which would serve only the Vantage Bay development. However, this proposed new facility would be integrated into the operation of the main plant in the number of ways as discussed below. It is anticipated that the new satellite facility would provide a high level of treatment such that the treated wastewater is reclaimed disinfected and will be suitable for unrestricted irrigation use.

Flow Equalization Facilities

Currently flows expressed in terms of average flow for the peak month are only 30 to 40% of design. However, during peak weekends, such as concert weekends for the gorge at George, the peak rated capacity of the plant is exceeded on an instantaneous basis.

We have spoken with a treatment plant operator. He has indicated that on peak weekends, the capacity of existing plant is exceeded; resulting in exceedences of the facility NPDES permit. Therefore, while it appears that there is additional capacity on the average monthly flow basis, the treatment plant is actually overloaded and is apparently near to being out of compliance with its permit.

The plant must come into compliance with its permit prior to connecting additional load into the plant. This can be achieved by equalizing the flows coming into the plant, such that peak weekend flows are retained from the incoming flow and treated during the following week, when incoming flows are low. This is a physical process wherein a storage tank is installed to store the excess weekend flows in an equalization basin. The equalization basin includes mechanical mixing and aeration to keep the content from going septic and an associated odor problem.

By installation of an equalization basin, the actual capacity of the existing plant is effectively increased because the treatment of capacity is no longer limited by the peak flows observed on peak weekends. It appears that the flow from the north side of the freeway, plus some increase in flow, can be accommodated by installation of flow equalization tankage at the existing treatment plant. Presumably, installation of flow equalization tankage would also accommodate some of the proposed new Vantage Bay residential units south of the freeway.

The engineer is currently awaiting flow data from the existing facility so that we can size and cost estimate the flow equalization facility.

Upgrading the Facilities at the Existing Wastewater Treatment Plant Site

Upgrading of the district's wastewater treatment facilities is a feasible option providing wastewater treatment for the new Vantage Bay development. Ultimately the existing facility must be upgraded to meet the needs of the district even if flow equalization facilities are provided at present. However there are several significant issues which prevent a timely upgrade of the existing facilities.

Upgrading of municipal wastewater treatment facilities is a timely process. The most time consuming portion of the process is the planning stage. However, design of the facilities, securing funding for facilities improvements, and facility construction also requires substantial time commitments.

For Kittitas Water District #6, the most time consuming portion of the planning process is probably preparation of a comprehensive sewer plan. This would probably require an update of the Vantage Subarea Plan. This 20-year planning document would need to address the needs of the entire district including the area north of the freeway. The comprehensive plan would be followed by an engineering report specifically addressing upgrading of existing facilities. After approval of these documents by the Department of Ecology, the District would secure funding for designed design the facilities, and then move into the construction phase. This would normally take a minimum of several years.

The timing of the Vantage Bay development project does not fit well with the facility upgrading scenario outlined above. However, an alternative scenario is outlined below, whereby a smaller satellite facility would be developed for the Vantage Bay development only. Since the main plant and the satellite facility are operated as a single unit, considerations of the main plant in the satellite facility are fundamentally related. For this reason, we give a broad outline of the future costs of upgrading the existing treatment plant in today's dollars.

The existing plant is a small activated sludge package plant with steel constructed basins. The clarifiers are inefficiently designed and the plant is essentially outdated. It would be very difficult to upgrade the existing plan in a cost-effective manner. Rather than upgrading the existing plant, it would be preferable to construct a new modern plant, incorporating the existing plant into the overall design. The most likely option for incorporating the existing plant into overall design would be to use it in a solids management function, which is an important and expensive component of any plant.

The most cost effective secondary wastewater treatment plant on the market today is known as the Sequencing Batch Reactor (SBR). These facilities are also relatively easy to operate. A likely scenario for upgrading the existing facility would be to locate a sequencing batch reactor plant in the vicinity of the existing activated sludge plant. If they flow equalization facility were to be built at this time, then the design of the future SBR would be considered in design the flow equalization facility. How the flow equalization with facility would fit into the SBR process scheme would be considered in advance. As mentioned previously, the existing plant would become an aerobic digester for waste activated sludge when the new SBR is constructed.

The new SBR option must be based on some kind of projection of future flows for the entire District. Thus, it will be necessary to have information not only on the current proposed development. In addition, the entire district's flows must be estimated. This information is not in the wastewater facility plan, dated June 2001.

The design flow is normally estimated in a document called a comprehensive sewer plan. A comprehensive sewer plan looks at development trends as well as county planning documents to arrive at a design flow at full build out for all the parcels within the district. There is currently no comprehensive plan available. However, since it may be several years until the plant is constructed, an estimate of the design flow is probably adequate at this point. Ultimately, a comprehensive sewer

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plan for the district must be prepared to resolve these issues before engineering plans for an upgraded main plant can be developed beyond flow equalization improvements discussed above.

The level of detail in development planning of other large landowner(s) within the district is unknown. This presents a problem for the engineer, as substantial time could potentially be invested in clarifying the development plan of others. In order to resolve this issue, our scope of work assumed that the client, Vantage Bay, would work with other major landowner(s) within the district to ascertain their future plans to the extent possible.

Following the planning meeting of May 5, 2006 I spoke with Ken Jacobson concerning the best method to secure information from Bryan Stockdale, the major landowner in the district, concerning his future development plans. We agreed that it might be best for the engineer to send a technician to debrief Mr. Stockdale. I have not actually arrange this interview as of yet, because one of Mr. Stockdale's properties burned down this week and he is apparently quite busy. I will try to contact him, on Thursday, May 25, when I'm at the site with the electrical engineer.

The Satellite Plant Proposal (Effluent Reuse/MBR Option)

We understand that the Vantage Bay development project is projected to proceed at a much more rapid rate than can be accommodated by the above described process for upgrading the existing treatment plant. We have therefore developed a plan that is consistent with the anticipated Vantage Bay schedule. This approach includes a reuse component to the project, which is generally considered an asset by both the Department Ecology and perspective customers.

The immediate need of the development involves options/strategies to demonstrate to Kittitas County officials that adequate sewer capacity will be available to the new development as necessary when the units are constructed the scope of work proposes the following approach:

- The engineer will estimate the cost of installation of a satellite Membrane Bioreactor (MBR) south of the freeway for the purpose of effluent reuse. The MBR would be sized to serve the new development only, however it could be potentially be expandable to serve all the potential sources south of the freeway.

  The facility would be integrated into the existing plant for the following purposes:
  1. In the winter, the flow from the MBR would be pumped to the existing facility for discharge out the outfall.
  2. In the summer, when demand for irrigation water is high, part of the effluent or wastewater from the existing plant would be pumped to serve as a source for further reclaimed water to the satellite facilities.

Reclaimed Water, means effluent derived from a wastewater treatment system that has been adequately and reliably treated, so that the as a result of that treatment, it is suitable for beneficial use and is no longer considered waste water. Reclaimed water systems are regulated under the Water Reclamation and Reuse Standards published by the Department of Health and Ecology in September 1997.

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In our approach to this project their would be a single integrated treatment plant consisting of the main plant adjacent to the existing treatment plant and an integral satellite treatment plant, treating wastewater from the south side of the freeway to reclaimed water standards. We believe that there would be a significant interest on the part of homeowners in the Vantage Bay development for reclaimed water.

It is important to note that the amount of waste water generated by an individual residents is substantially lower than that same residential unit would use irrigation if reclaimed water where an unlimited source. In other words, the demand for reclaimed water in the Vantage Bay development would likely exceed supply. For this reason we included the possibility of securing reclaimed water from the main plant that would be otherwise discharged to the outfall and treating that water to the reclaimed water standards for use in the Vantage Bay development.

One of the imported advantages of this proposed approach is that it appears that we could proceed with improvements more rapidly than would be feasible in upgrading the main plant. We have spoken with Mr. David Dunn, of the Department of Ecology (05/24/06). Mr. Dunn is the review engineer, who will be responsible for reviewing both the engineering report and ultimately the design of the facility. Mr. Dunn has tentatively agreed with the design approach and we have worked quite well with him in the past.

One issue that we foresee with respect to Ecology's review, concerns wastewater service to the other properties on the south side of the freeway. In the future, the sources would need to be discharge either to the main plant or the MBR facility. If they were to discharge to the MBR facility, then we would need to either up-size the satellite plant, or plan for its future expansion. In either case, we will need more accurate information on the development plans of other landowners on the south side of the freeway.

Design Flows and Loading for the Vantage Bay Development

Design guidelines for waste water treatment systems in the State of Washington are provided in the Department Ecology publication. Criteria for Sewage Works Design. In table G2 -- 1.3 is provided below from these guidelines.

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Table G2-1. Design Basis for New Sewage Works

Discharge Facility	Design Units	Flow* (gpd)	BOD (lb/day)	SS (lb/day)	Flow Duration (hr)
Dwellings	per person	100	0.2	0.2	24
Schools with showers and cafeteria	per person	16	.04	.04	8
Schools without showers and with cafeteria	per person	10	.025	.025	8
Boarding schools	per person	75	0.2	0.2	16
Motels at 65 gal/person (rooms only)	per room	130	0.26	0.26	24
Trailer courts at 3 persons/trailer	per trailer	300	0.6	0.6	24
Restaurants	per seat	50	0.2	0.2	16
Interstate or through-highway restaurants	per seat	180	0.7	0.7	16
Interstate rest areas	per person	5	0.01	0.01	24
Service stations	per vehicle serviced	10	0.01	0.01	16
Factories	per person per 8-hr shift	15-35	0.03-0.07	0.03-0.07	Operating period
Shopping centers	per 1,000 sq ft of ultimate floor space	200-300	0.01	0.01	12
Hospitals	per bed	300	0.6	0.6	24
Nursing homes	per bed	200	0.3	0.3	24
Homes for the aged	per bed	100	0.2	0.2	24
Doctor's office in medical center	per 1,000 sq ft	500	0.1	0.1	12
Laundromats, 9 to 12 machines	per machine	500	0.3	0.3	16
Community colleges	per student and faculty	15	0.03	0.03	12
Swimming pools	per swimmer	10	0.001	0.001	12
Theaters, drive-in type	per car	5	0.01	0.01	4
Theaters, auditorium type	per seat	5	0.01	0.01	12
Picnic areas	per person	5	0.01	0.01	12
Resort camps, day and night, with limited plumbing	per campsite	50	0.05	0.05	24
Luxury camps with flush toilets	per campsite	100	0.1	0.1	24

*Includes normal infiltration

The number of residents per unit in a residential development is not specified in the design criteria. This value is based on the circumstances of the development and is up to the engineer to provide. Due partially to the fact that these homes will generally be second homes; we assumed that the number of residents per dwelling is 2.0 corresponding to 200 gallons per day per dwelling unit. Based on the above table, the following design criteria for the Vantage Bay development is provided:

Vantage Bay WWTP Sizing Basis				
Reference: WDOE Criteria for Sewage Works Design, December 1998				
Discharge Facility	**Design Units**	**Flow (gpd)**	**BOD (ppd)**	**SS (ppd)**
Dwellings	per person	100	0.2	0.2
Assumed persons per dwelling Unit		2		
Assumed Dwelling Units		310		
Results				
Design Flow	62,000	Gal/Day		
BOD	124	PPD		
TSS	124	PPD		

We are currently at cost estimate for a package MBR plant with a capacity of 75,000 gallons per day.

Scalping Plant

We are investigating the cost of a conventional filtration process to treat the main plant effluent to reuse standards directly without involving the MBR. We believe that this will have value in estimating the cost of a reclaimed water meter. If there is enough demand for reclaimed water, then a scalping plant could be used to secure the needed water to meet the irrigation demands of the Vantage Bay development. (Out of Scope)

25 May, 2006

Scott Turnbull
Kittitas County Planning Department
411 N Ruby St, Suite 2
Ellensburg, WA 98926

Dear Scott,

Re: Initial consultation concerning cultural resources investigations at a BCSCBN Inc proposed housing project in the East half of Section 30, Township 17 North, Range 23 East, W.M., Kittitas County, Washington pursuant to SEPA and SMA; on Parcel numbers 17-23-30010-0006, 17-23-30000-0003 and 17-30000-0001. A recently accomplished pedestrian archaeological survey revealed an isolated find on the 59 acres. Sub-surface tests and probes are in progress for proposed roads, easements and utility lines and will be reported separately. Area Tribes have been contacted by e-mail and by telephone and initial responses recorded herein, both verbal and written.

On behalf of BCSCBN Inc. and at the request of their representative Skip Coddington, we have completed a 10m interval pedestrian archaeological and cultural site survey of the ground surface and initiated a sub-surface shovel and auger probe evaluation of the culturally sensitive sediments on the above referenced properties. SEPA (RCW 34.21) requires government decision makers to consider likely environmental consequences of a proposal and requires mitigation measures. Historic and cultural resources occur on the Washington State Environmental Policy Act (SEPA) checklist. The Shoreline Management Act (RCW 90.58) contains archaeological protections including the responsibility for inspection of areas within 200 feet from the shoreline in consultation with affected Indian Tribes prior to the governmental entity issuing a permit. Pursuant to these Statutes along with the project's proximity to significant cultural sites just upriver near Vantage warrant proceeding with the consultation and inventory process. Pursuant to these requirements and prior to the initiation of the pedestrian survey, we queried the Department of Archaeology and Historic Preservation archives and records in Olympia, as well as the affected Tribes, including the Colville Confederated Tribes, the Yakama Nation, and the Wanapum Band as well.

In our search of the archives, records and literature we found no recorded cultural sites for this 59 acre area, although 45-KT-88 was known to be nearby, a well-known archaeological data recovery effort there in 1966 was in advance of the then proposed I-90 rerouting into Rye Grass Coulee from Schnebly Coulee to the north. Findings for that data recovery project were reported in Munsell (1966) as a University of Washington thesis in Anthropology. The site gained attention again recently in reference to the so-called Kennewick Man case (K. Ames: DOI testimony). Initial research of records provided to us suggested 45-KT-88 was inaccurately located on current maps and the original site file from the 1960's misrepresented its location also (see below).

In addition, the Colville Confederated Tribes (CCT) responded that a Traditional Cultural Property has been designated for the Vantage area albeit north of the project, and as well their letter stated that the project is within the aboriginal area of the Moses Columbia Tribe a constituent of the CCT. Yakama Nation representative Johnson Meninick, contacted by e-mail and by telephone requested notification should archaeological finds be made in the area. Rex Buck of the Wanapum (personal communication in Richland, WA) expressed an interest in the project and the "true" location of the Rye Grass Coulee site if and when it is relocated. Archaeologists Pete Rice and Brett Lenz of Grant County shared information about their recent cultural surveys and designated sensitive areas which in part has guided our efforts.

As a result of our literature search, and consultation with Tribes, and the Grant County PUD we have identified a pattern of landuse and a projection of that use onto the landforms for our project area. So-called winter village sedentism, from the mid Holocene to historic times, exhibits a patterned use of landforms which included the upper terraces of the Columbia River (and potentially the project area); land use patterns include using such areas for temporary camps, cemeteries, so-called rock art, opportunistic sourcing of tool stone, trails to lithisol root grounds or to other plant resource areas, to access springs, hunting areas, or grazing areas of the equestrian era to name a few.

Few data are available allowing us to model land use on these upper terraces such as our project area, yet the lower terraces designated Qht (Quaternary Holocene terrace) by Grant County for the Wanapum and Priest Rapids FERC relicensing projects and of which many are inundated within the reservoirs, reveal a greater density of finds including aboriginal pit house villages. Archaeological site density and site types found on these lower terraces reveal more intensive use throughout much of prehistory although settlement pattern data leave much to argue about. Our impressions from their survey data suggest an increasing density of use may also occur on these upper terraces proximate to the mouths of major coulees such as Rye Grass Coulee or Schnebly Coulees in the Vantage area. That said there is some likelihood that burials occur on these Pleistocene terraces within the project area, and that this probability albeit low in our estimation, would be a major concern to area Tribes.

Large area surveys have also been completed for the Yakima Training Center and the adjacent shrub-steppe areas of the nearby uplands where root grounds, tool stone sources, and hunting and grazing areas are recorded. Several coulees with their gentle gradient to the uplands were water sources and likely plant and animal procurement areas; the coulees provided rock shelter storage areas, and served as major travel corridors for man and animals in the past as well as today.

In one important sense to Tribal members, the subsurface testing of the project area is warranted in that where even a small burial yard, a lone interment, or a cache or any archaeological resources might possibly be exposed, the project would gain from knowing this as soon as possible so that appropriate steps can be taken under State Law. It should be noted that as Project Archaeologists we have been asked to examine the sub-surface sediments of the roads and utility lines, not individual house sites.

Surface examination of the property reveals a very low density of archaeological items visible on surface. Several cut-bank and archaeological test loci on the property reveal a minor (2-4cm) accretion of aeolian sediments since the St Helens ash fall of 1980. Bioturbation or mechanical disturbance of surface sediments over the entire project is evident in part from recent use as a horse pasture. The uppermost sediment which is a shallow stratum of stabilized aeolian sands appears to have originated in early Holocene times and is considered a target for further tests and evaluation. In some areas this unit overlies lake sediments and alluvium of unknown, likely Pleistocene age.

Of special concern in our surface survey and research so far has been our effort to accurately relocate 45-KT-88, the Rye Grass Coulee site, which we surmised was erroneously placed on the State base map provided to us. Our final assessment is that the site is mapped too far to the east mostly under the I-90 bridge abutment area. This is not far from the property proposed for development, therefore initially causing some concern to us. David Munsell, a retired Archaeologist now of Santa Fe, had informed us that in his opinion at least 40-60% of this archaeological property was outside the footprint of I-90 and available to future researchers but "up the Coulee" some distance from Huntziker Road and west of its mapped location in Section 29. Inquiries were made at the Burke Museum, WSDOT, and most importantly with the original researchers, including Bill Dancey of the original 1966 excavation. All parties including WSDOT Archaeologist Craig Holstine assisted in relocating the site; an updated site form will be a final result, placing that site remnant 500 or so meters from the project area. Therefore the initial assumption was verified by a reexamination of the available sources that no effect can result from the proposed project on this site, with the added bonus that any remnant can properly be protected by WSDOT. These finding will be filed as a separate report.

In addition to the surface examination already completed, the project will continue to perform subsurface tests in the form of auger holes placed on the roads and utility lines of the proposed undertaking. These subsurface tests will be performed by Northwest Geocultural of Ellensburg WA, Tucker Orvald, Principal. Should cultural remains be unearthed in these test holes, project representative Skip Coddington will be notified and a path forward negotiated. The data recovered from the pedestrian and subsurface surveys will be reported separately. Should human remains be unearthed, project activities will stop, the area secured and the County and area Tribes as well as the Department of Archaeology and Historic Preservation will be consulted.

Huntzinger or Wanapum Road is the main access to the project area and ingress and egress will cross a small sliver of Gingko State Park property in proximity to that road, which is at the western margin of the proposed development. Auger testing will be performed in those areas and any positive results for archaeological remains will be shared with Washington State Parks immediately. If human remains are unearthed in this easement, project activities will stop, the area secured and the Washington State Parks Archaeologist Dan Meatte will be consulted to initiate that agency's existing protocol with area Tribes in such matters.

Further questions about the project can be sent to Skip Coddington of BCSCBN Inc 21828 87th Ave SE Suite 200 Woodinville, WA 98072, Office # 425-488-7625 and Cell # 206-953-6710. Tucker Orvald of Northwest Geocultural can be reached by phone at

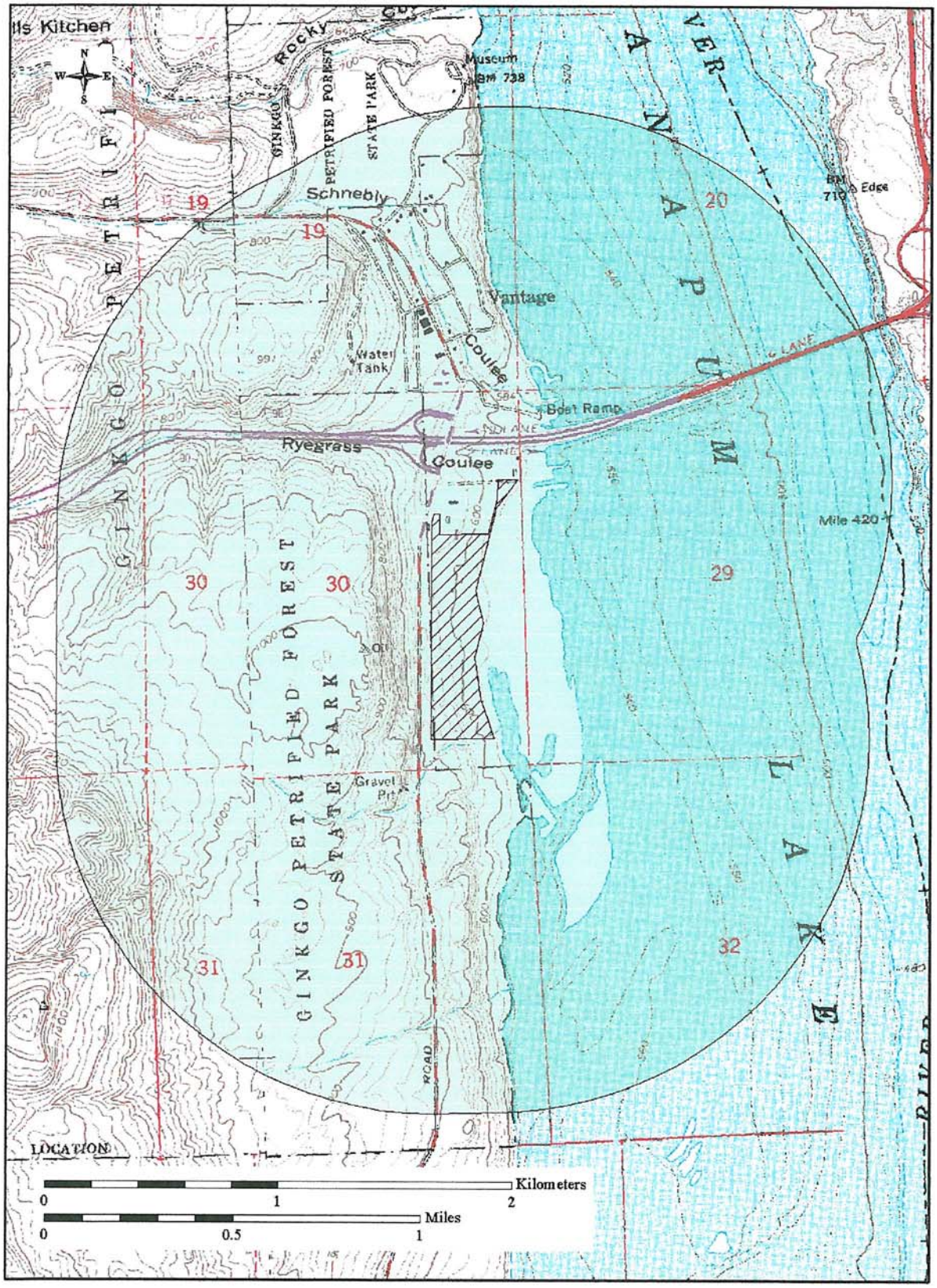
#509-925-5379 and Cell # 509-899-0108. Follow-up questions about this initial consultation letter to Kittitas County can be directed to Greg Cleveland, Office # 509-453-1514 or Cell # 509-945-6746.

Sincerely,

Greg Cleveland
902 ½ S 32nd Ave
Yakima, WA 98202

Attachments

cc
Todd Lolkus, Surveyor
Skip Coddington, BCSCBN Inc
Tucker Orvald, Northwest Geocultural
File


Rocky
Museum
Elev 738
GINKGO PETRIFIED FOREST STATE PARK
Schnebly
Vantage
Water Tank
Coulee
Boat Ramp
Ryegrass
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SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THIS SHORT PLAT MAP IS BASED UPON AN ACTUAL SURVEY AND SUBDIVISION OF A PORTION OF AYERS ADDITION IN SECTION 24, TOWNSHIP 18N, RANGE 2W, W.M.; THAT THE DISTANCES AND COURSES SHOWN THEREON ARE CORRECT; THAT THE MONUMENTS HAVE BEEN SET AND LOT AND BLOCK CORNERS STAKED ON THE GROUND WITH 5/8" REBAR AND PLASTIC CAPS STAMPED "JSP 28073"

JEFF S. PANTIER REGISTERED PROFESSIONAL LAND SURVEYOR,
L.S. CERTIFICATE # 28073
DATE 3/29/05

HATTON GODAT PANTIER
ENGINEERS AND SURVEYORS
1840 BARNES BOULEVARD S W
TUMWATER, WA 98512
TEL: 360.943.1599 FAX: 360.357.6299
hattonpantier.com

CITY OF OLYMPIA SHORT SUBDIVISION NO. SS-04 0612 OL

QUARTER/QUARTER	QUARTER	SECTION	TOWNSHIP	RANGE
NW 1/4 AND SW 1/4	NW	24	18N	2W W.M.

ASSESSORS ORIGINAL PARCEL NUMBER(S)
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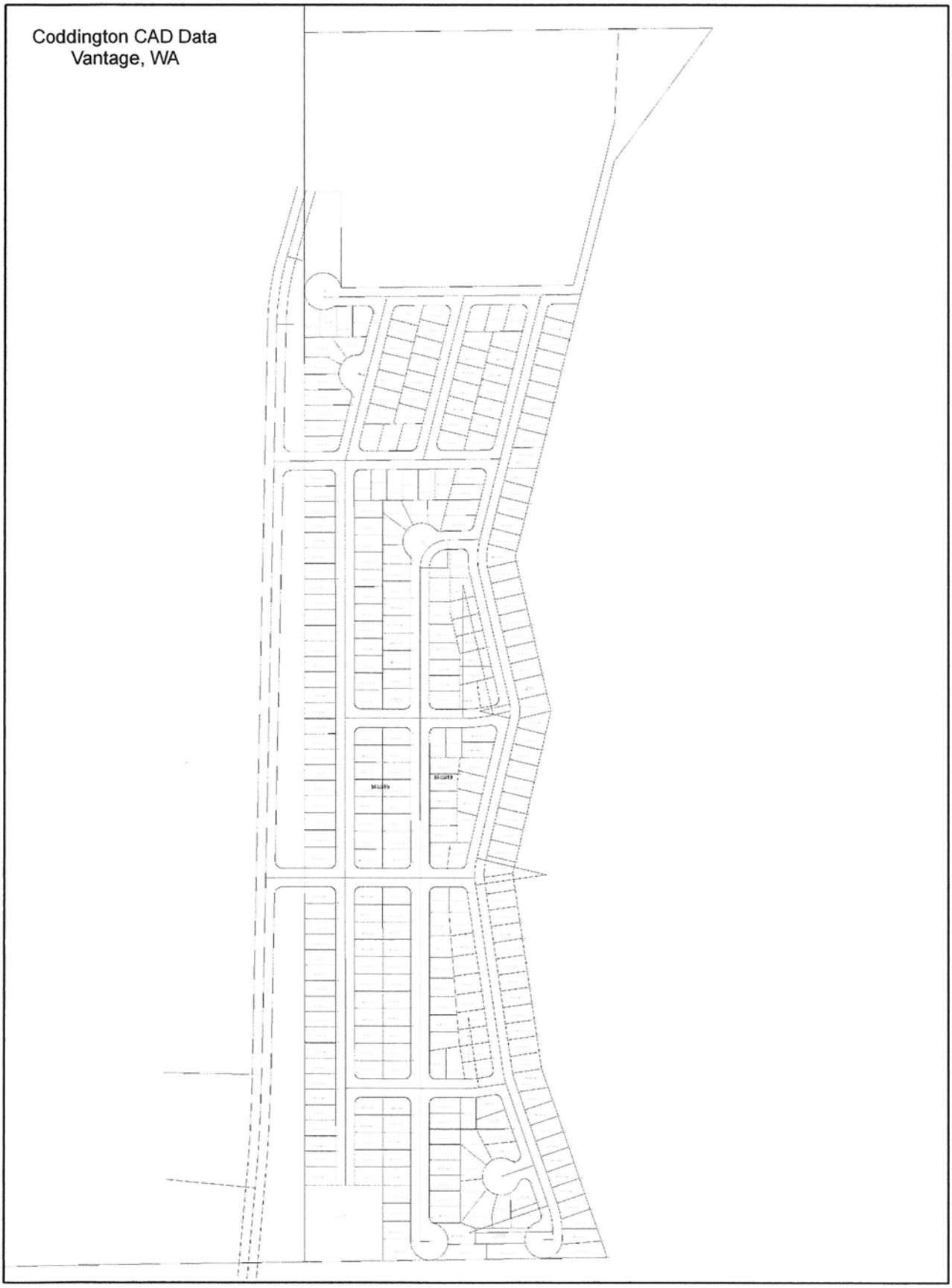
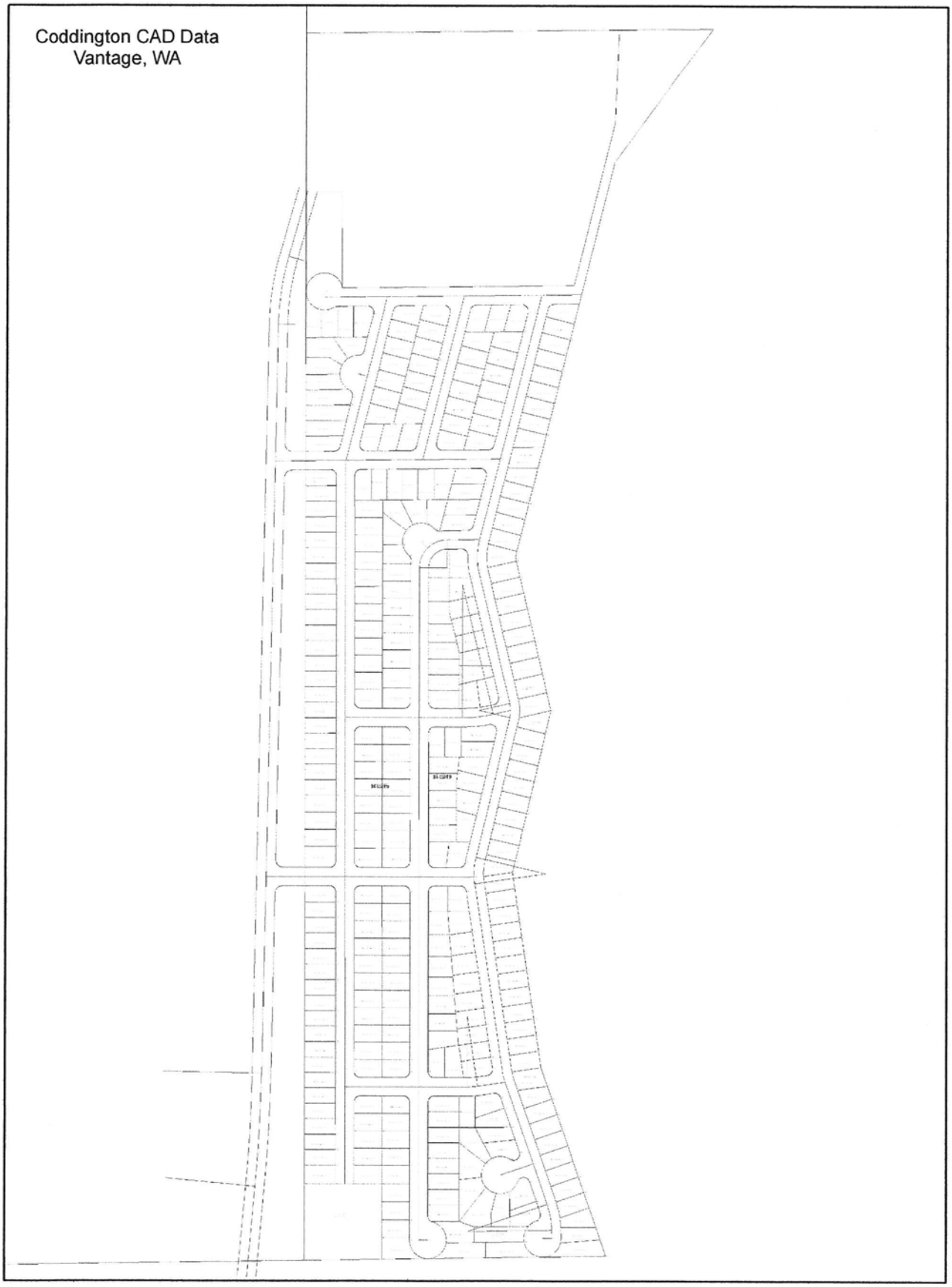
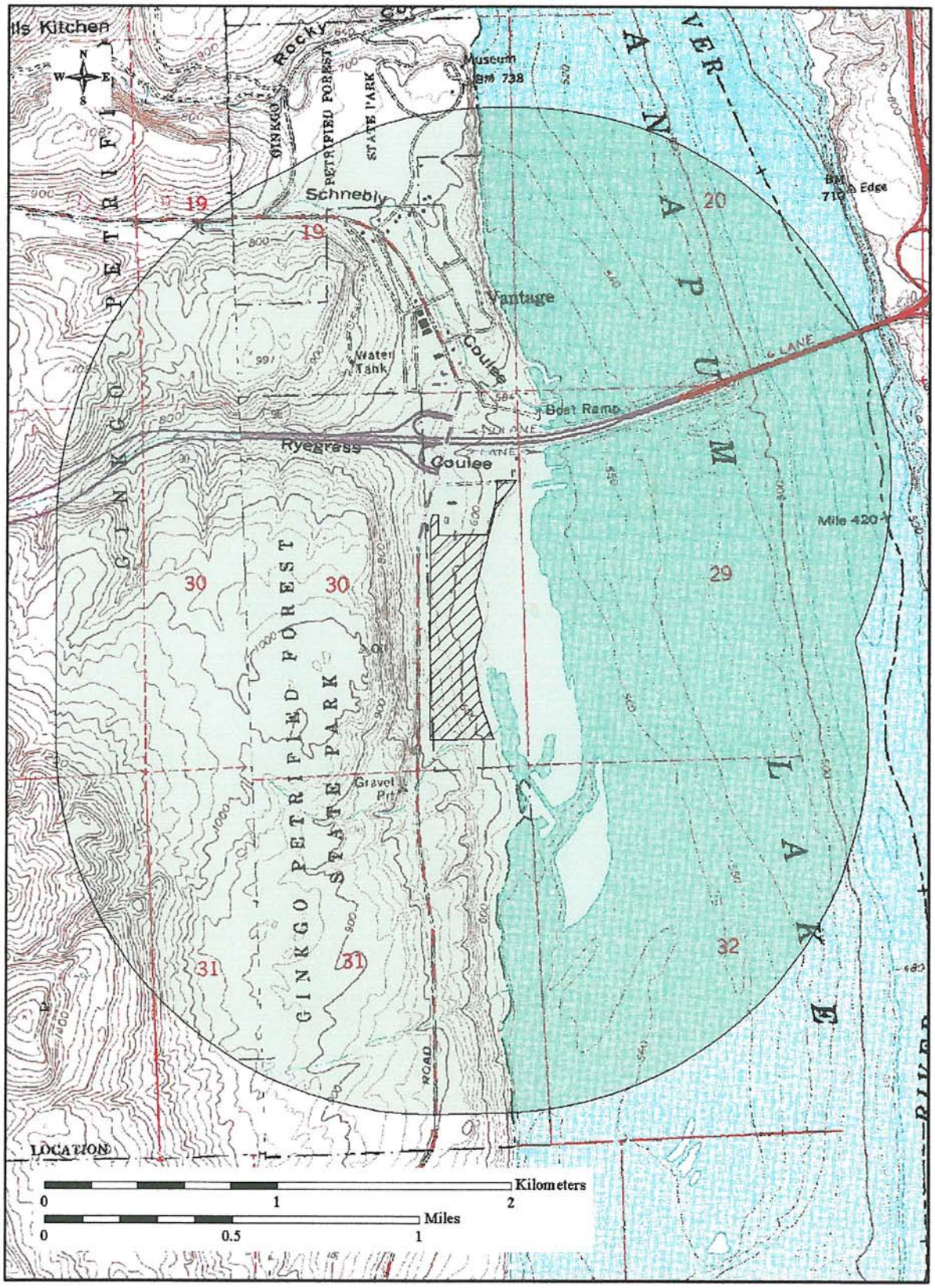
04-076

Coddington CAD Data
Vantage, WA



Coddington CAD Data
Vantage, WA




Rocky
Museum
BM 738
GINKGO PETRIFIED FOREST STATE PARK
Schnebly
Vantage
Water Tank
Coulee
Boat Ramp
I-90 LANE
Ryegrass
Coulee
Mile 420
GINKGO PETRIFIED FOREST STATE PARK
Gravel Pit
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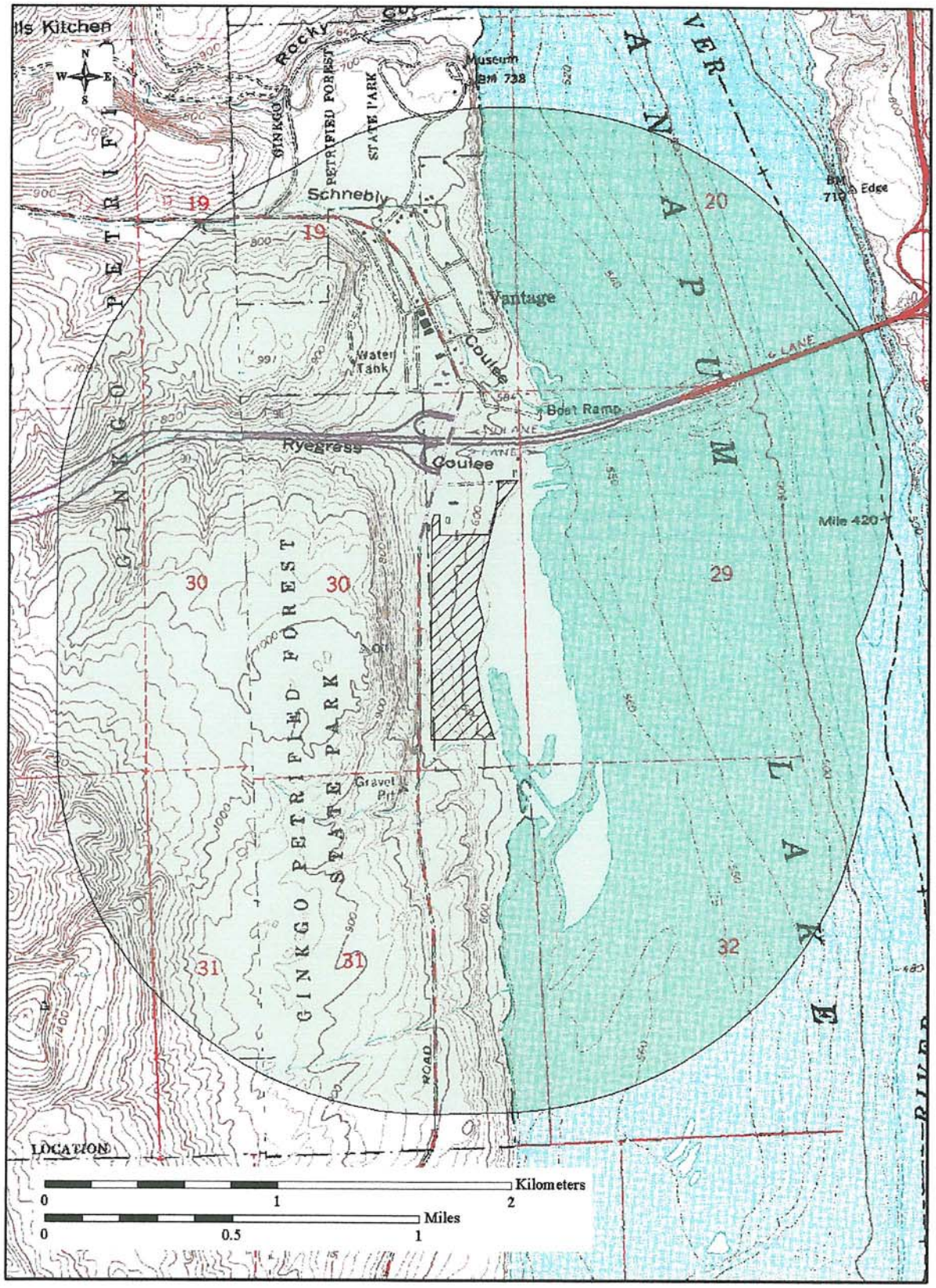
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Museum
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Vantage
Water Tank
Coulee
Boat Ramp
Ryegress
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32
Gravel Pit
Ginkgo Petrified Forest State Park
Road
Columbia River
LOCATION
Kilometers
0
1
2
Miles
0
0.5
1

Coddington CAD Data
Vantage, WA