NHL 11/4/1993

RECEIVED
DEC 1 8 1995
Div Hist Pres

1. NAME OF PROPERTY

Historic Name: SOLDIERS' HOME REEF

Other Name/Site Number: Rocky Point, National Military Asylum Reef, Veterans' Hill, Stadium Reef

2. LOCATION

Street & Number: Clement J. Zablocki Veterans Affairs Medical Center grounds, northeast of Wood Avenue and General Mitchell Boulevard Not for publication: ___

City/Town: Milwaukee Vicinity: ___

State: WI County: Milwaukee Code: 079 Zip Code: 53295

3. CLASSIFICATION

Ownership of Property
Private: ___
Public-Local: ___
Public-State: ___
Public-Federal: X

Category of Property
Building(s): ___
District: ___
Site: X
Structure: ___
Object: ___

Number of Resources within Property

Contributing	Noncontributing	
___	___	buildings
1	___	sites
___	___	structures
___	___	objects
1	0	Total

Number of Contributing Resources Previously Listed in the National Register: ___

Name of Related Multiple Property Listing:

4. STATE/FEDERAL AGENCY CERTIFICATION

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ____ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ____ meets ____ does not meet the National Register Criteria.

_____ _____
Signature of Certifying Official Date

_____
State or Federal Agency and Bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria.

_____ _____
Signature of Commenting or Other Official Date

_____
State or Federal Agency and Bureau

5. NATIONAL PARK SERVICE CERTIFICATION

I hereby certify that this property is:

____ Entered in the National Register _____
____ Determined eligible for the National Register _____
____ Determined not eligible for the National Register _____
____ Removed from the National Register _____
____ Other (explain): _____

_____ _____
Signature of Keeper Date of Action

6. FUNCTION OR USE

Historic: Landscape Sub: Natural Feature
Park

Current: Landscape Sub: Natural Feature

7. DESCRIPTION

ARCHITECTURAL CLASSIFICATION: N/A

MATERIALS: N/A
Foundation:
Walls:
Roof:
Other:

Describe Present and Historic Physical Appearance.

Soldiers' Home Reef is a fossil reef that grew approximately 400,000,000 years ago during the Silurian Period (unit of geological time dating from 430,000,000 to 400,000,000 years ago) of Earth's history when this part of North America was located 20° south of the equator and was covered by shallow tropical seas. The reef is situated within the Racine Dolomite (this is the proper name for a specific Silurian rock unit in Wisconsin and Illinois), and contains a variety of marine fossils including trilobites, (extinct free-living, marine invertebrate animal belonging to the arthropods), cephalopods (swimming marine invertebrate molluscan animal, either with shell [e.g., the chambered *Nautilus*] or without shell [e.g., squid]), brachiopods (sedentary marine invertebrate animal with bivalved shell), pelmatozoans (marine invertebrate animal belonging to the echinoderms, having a stalk [e..g, crinoid]), bivalves, bryozoans (colonial marine invertebrate animal with microscopic polyps in an often-branched colony; sometimes called a moss animal) and corals.[1]

The reef occurs in a hill that is approximately 500 feet long by 300 feet wide by 70 feet high and projects into the Menomonee River valley from a bluff underlying the historic National Soldiers' Home complex. This is the only undisturbed natural rock bluff remaining along the Menomonee River in Milwaukee County. The reef occurs as a northward-facing rock outcrop in the lower 35 feet of this bluff, and extends for about 450 feet in an east-west direction. The reef hill is the centerpiece of the natural bluff, which features both an endangered plant species unique in the County, and Native American archaeological sites.[2] The top of the reef, as well as its west, south, and southeast margins, are covered by glacial sediments and soil. Located just 500 feet northeast of "The Main Building" (1869), one of the oldest buildings and the center of activity for the original Soldiers' Home,[3] it forms a wooded hill that is part of the historic park-like landscape. Just north of the rock face is a chain-link fence that separates the Soldiers' Home grounds from the parking lot at Milwaukee County Stadium, the land for which had been the Soldiers' Home farm property.

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[1] Mikulic, Donald G., "The Paleoecology of Silurian Trilobites with a Section on the Silurian Stratigraphy of Southeastern Wisconsin", Ph.D. Dissertation as a partial fulfillment of Ph.D., submitted to Oregon State University, 1979.

[2] Personal communication with Donald G. Mikulic and Joanne Klussendorf, December 11, 1990.

[3] *125 Years (1867-1992)...in Honor of your Service.* 125th Anniversary Historic Walking Tour Booklet of the Clement J. Zablocki Veterans Affairs Medical Center.

The earliest known view of the reef is an 1875 lithograph showing the prominent reef hill as a focal point of the attractive Soldiers' Home grounds.[4] The site of the Soldiers' Home in Milwaukee, the city where the concept for these homes for disabled veterans had originated during the Civil War, had been carefully selected, and the grounds were considered "truly magnificent" and the "finest in the country." Nearly 150 acres of the undulating, wooded grounds were laid out as a park, and even many years later it was thought that "no park in the country excels it in natural beauty."[5] From the dedication of the Soldiers' Home in 1869 until the development of a municipal park system around 1900, these grounds served as one of the most popular park and recreation areas for Milwaukee residents.

Soldier's Home reef has changed little since pioneer settlement of the area in the 1830s. The ruins of a small, one-story, stone gun-powder magazine (1881), used to store ammunition for firing salutes at official ceremonies, is located southeast of the reef on the same hill. The only alterations to the reef have been the dumping of fill along the north toe of the exposure in the 1920s and during construction of the stadium parking lot in the early 1950s. Also, a "ski slide" (from which only a few drill marks remain) was constructed down a small portion of the east end of the north face of the reef as part of a 1933 Federal CWA project to develop some of the farm property as an outdoor recreation center for Milwaukee County. In the early 1950s, a small section of bleacher seating was constructed on the top of the hill (then called Veterans' Hill) that allowed VA center patients to view sporting events at the nearby stadium, but it has been removed. Although the area to the north of the reef has been altered by construction of Milwaukee County Stadium and its parking lot, the rest of the surrounding area retains the rolling topography of the original nineteenth-century Soldiers' Home park-like grounds. Soldiers' Home Reef can be observed readily from the adjacent Milwaukee County Stadium parking lot, and it is also accessible by foot from the Soldiers' Home grounds.

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[4] Kurz, Louis., *National Soldier's Home near Milwaukee.* American Olegraph Co., 1875. Original in the Chicago Historical Society.

[5] A.T. Andreas, *History of Milwaukee, Wisconsin* (The Western Historical Society, 1881), p. 1881.

8. STATEMENT OF SIGNIFICANCE

Certifying official has considered the significance of this property in relation to other properties: Nationally: X Statewide: ___ Locally: ___

Applicable National Register Criteria: A X B X C D

Criteria Considerations (Exceptions): A___ B___ C___ D___ E___ F___ G___

NHL Criteria: 1, 2

NHL Theme(s): XIII. Science
B. Earth Science
2. Geology

Areas of Significance: Science

Period(s) of Significance: 1836-1939

Significant Dates: 1862, 1877

Significant Person(s): James Hall;
Thomas Crowder Chamberlin;
Increase Allen Lapham

Cultural Affiliation: N/A

Architect/Builder: N/A

State Significance of Property, and Justify Criteria, Criteria Considerations, and Areas and Periods of Significance Noted Above.

SUMMARY

Soldiers' Home Reef meets Criteria A and B for listing in the National Register of Historic Places and Criteria 1 and 2 for designation as a National Historic Landmark.[1] This site is important in the history of the science of geology in the United States for the key role it played in the first recognition of fossil reefs in North America, a major geological concept, and for its association with the careers of several nationally significant nineteenth and early twentieth century geologists. This rock mound in the Menomonee River valley near Milwaukee was discovered by Increase A. Lapham, Wisconsin's first scientist, in the 1830s. In 1862, James Hall was the first to recognize and interpret Soldiers' Home and two other mounds in the vicinity as fossil reefs, making them the first ancient reefs described in North America and among the first described anywhere in the world. Thomas C. Chamberlin used Soldiers' Home and these other reefs in formulating his paleoecological (study of the relationships between ancient organisms and their environment) and sedimentological model of reef development, which was published in his classic 1877 work, *Geology of Eastern Wisconsin*. The two other rock mounds used to define the fossil reef concept have been destroyed or greatly altered by quarrying; only Soldiers' Home Reef remains much as it was when these early geologists first saw it. Therefore, it is the only site that demonstrates the appearance, especially the mound-like configuration, which attracted the attention of these early geologists and was instrumental in formulating this important geological concept. Consequently, Soldiers' Home Reef is important to our understanding of fossil reefs and will continue to provide important information to geological studies. The period of significance for this site was determined to begin with Lapham's arrival in Milwaukee in 1836, when he began his geological investigation of the region, and to end with Robert Shrock's reef study of 1939.

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[1] On March 28, 1992, the Soldier's Home Reef was determined to be eligible for listing in the National Register of Historic Places as a result of an agreement between the State Historic Preservation Officer for Wisconsin, the Federal Preservation Officer for the Veterans Administration and the Director of the Clement J. Zablocki Veterans Medical Center. All parties agreed for a recommendation of national significance for this property. For further information the reader should refer to the following:

Charles W. Causier, "National Register of Historic Places Nomination Form--Soldier's Home Reef." (Milwaukee, Wisconsin: State Historical Society, 1992).

HISTORY

Anomalous mound-like rock features associated with normal flat-lying, bedded rocks were long viewed with curiosity by early geologists around the world, but their origin remained controversial. Not until the mid-nineteenth century were these features correctly interpreted as ancient fossil reefs, a concept which represents an important advancement in geological theory. Soldiers' Home Reef, along with two other mound-like rock features in the Menomonee River valley near Milwaukee, Wisconsin, played the key role in the first recognition and interpretation of fossil reefs in North America, and, therefore, possesses national significance in the history of science.[2] These reefs were further used to establish a model for ancient reef development, and they served as primary examples of such features in geology text books and geological research for well over 100 years.

During Wisconsin's early settlement, these conspicuous rock hills projecting out from the Menomonee River banks were quickly recognized as a source of lime for construction, and two of them have long since been destroyed or greatly altered by quarrying. Only the Soldiers' Home Reef remains virtually undisturbed since that time, even though it was the most prominent of the rock mounds, because it had become a focal point of the park-like National Soldiers' Home grounds in the 1860s. Wisconsin's eminent pioneer naturalist Increase Allen Lapham was the first to take note of these unusual rock mounds in the 1830s. He discovered a great abundance and diversity of fossils, including corals, which he noticed contrasted sharply with the low diversity and rarity of fossils in the local well-bedded rock (rocks that were deposited as layers of sediment) strata used for building stone, but he concluded erroneously that the masses were erosional remnants of a once more extensive rock unit overlying the well-bedded rock.

Considered Wisconsin's first scientist, Lapham is known for numerous contributions to many fields of natural history besides geology, including meteorology, cartography, botany, zoology, and archaeology.[3] Born in Palmyra, New York, on March 7, 1811,

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[2] Mikulic, D.G. and J. Kluessendorf, Preliminary report on the scientific, educational, and historical importance of Soldier's Home Reef, Milwaukee County, Wisconsin, Submitted to the Wisconsin Department of Natural Resources, 1991.

[3] Biographical Information about Lapham was taken from the following sources:

Sherman, S. S. Increase A. Lapham, LL.D., a biographical sketch read before the Old Settler's Club, Milwaukee: News Printers Company, 1876.

Bean, E. F. "Increase A. Lapham, geologist," Wisconsin Archeologist, Vol., 1, pp. 79-96.

Lapham developed his life-long interest in geology while working as a stone-cutter on the Erie Canal as a youth. He wrote his first geologic paper in 1828, when he was only 17 years old and a canal engineer at the Falls of the Ohio. In 1836, Lapham was called to Milwaukee by one of its earliest and most prominent citizens, Byron Kilbourn, to become chief engineer and secretary of the Milwaukee and Rock River Canal Company. Soon after his arrival, Lapham began to study the geology of the area, looking for economically important rock and mineral deposits. In 1844, he published a 250-page volume entitled *A geographical and topographical description of Wisconsin*, with brief sketches of its history, geology, mineralogy, natural history, population, soil, productions, government, antiquities, etc., which served as a handbook for new settlers for many years. By 1851, based on his geologic studies and James Hall's identification of his fossils, Lapham had been able to determine the stratigraphic succession of rock units in Milwaukee, define the general Paleozoic stratigraphic section for eastern Wisconsin, and establish correlation with the New York rock section.[4]

Interested in the public welfare throughout his life, Lapham was involved in establishing several local educational and scientific organizations, including the Wisconsin Academy of Sciences, Arts and Letters, the Wisconsin Agricultural Society, the Wisconsin Geological Survey, the Wisconsin Historical Society, and the Milwaukee Female College. In 1873, Lapham was appointed head of the Wisconsin Geological Survey, and he quickly assembled a noteworthy staff of young geologists, including T.C. Chamberlin and Roland Irving. He was replaced as head of the Survey by a political appointee of the new governor in 1875, and died a few months later on September 14th. Lapham's natural history collection, which included 10,000 fossils, minerals, shells, meteorites, and Indian relics was purchased for the University of Wisconsin, where it was destroyed in an 1884 fire. Soldiers' Home Reef, however, remains much the same as when Lapham undertook the first geologic studies of the area.

When Lapham was attempting to correlate the age of rocks in southeastern Wisconsin with the stratigraphic (chronological sequence of rock layers with oldest at bottom and youngest at top) reference section already determined for New York State during the early 1840s, he sent fossil specimens to the famous paleontologist James Hall, of the New York Geological Survey, for identification. His interest piqued by Lapham's fossils, Hall made several visits to the Milwaukee area in the 1850s to study the local geology. On the basis of this work, Hall became the first, in an 1862 publication, to recognize the Menomonee River

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[4] Lapham, I. A. *On the geology of the southeastern portion of the State of Wisconsin being part not surveyed by the United States geologists, in a letter to J. W. Foster by I. A. Lapham of Milwaukee*. In J. W. Foster and J. D. Whitney, Report on the geology of the Lake Superior land district, part 2. U.S. 32nd Congress, Spec. Session, Senate Executive Document No. 4, pp. 167-177.

valley mounds as fossil coral reefs, making them the first fossil reefs recognized in all of North America and among the first anywhere in the world. Hall noted that his interpretation of the reef origin of these features was based in part on their appearance as isolated hills or ridges of Coralline limestone that contrasted with the surrounding flat-lying, well-bedded rocks. He recognized that these hills were not erosional remnants of formerly continuous rock units, as thought by Lapham, but that they were individual reefs.

The interpretation of fossil reefs was one of the most important accomplishments for James Hall, perhaps the most eminent paleontologist and geologist in North America during the mid to late nineteenth century. Born in Hingham, Massachusetts, on September 12, 1811, Hall was introduced to science and natural history by his local public school teacher.[5] In 1830, Hall enrolled in the recently established Rensselaer Institute in Troy, New York, where Amos Eaton and Ebeneezer Emmons, two of the country's leading geologists, became his mentors. Four years after his graduation in 1832, Hall became the youngest geologist on the New York Geological Survey staff, and in only a few years more, he established a reputation as one of nation's leading geologists and paleontologists. While working on an exhaustive paleontological survey of New York, Hall also served as State geologist of Iowa and Wisconsin in the mid-1800s. In 1866, Hall was appointed director of the New York State Museum, and, in 1893, the position of State Geologist of New York was created especially for him. Through much of his career, Hall was active in scientific societies, being a founder of the Association of American Geologists and the American Association for the Advancement of Science, and serving as a charter member of the National Academy of Sciences. He was the first president of the Geological Society of America, president of the American Association for the Advancement of Science, and a three-time vice-president of the International Congress of Geologists. A prolific researcher and publisher, Hall had formulated the concepts of geosynclines (tectonically subsiding trough related to mountain building and plate tectonics) and fossil reefs, and had produced 15 quarto volumes containing more than 4000 pages of text and more than 1000 paleontological plates by the time of his death on August 7, 1898. He also trained many students who would become some of the most prominent geologists and paleontologists in North America.

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[5] Biographical information on James Hall was taken from the following sources:

Fenton, Carroll Land, and Mildred Adams Fenton. Giants of Geology. (New York: Doubleday & Company, 1952).

Clark, John M. James Hall of Albany, geologist and paleontologist 1811-1898. (Albany, New York: Arno Press Reprint, 1978).

Hall's interpretation of the Milwaukee reefs was expanded upon by Thomas Crowder Chamberlin, the renown American geologist and educator. Chamberlin's research on the bedrock geology and reefs of Wisconsin was very innovative and influential. He recognized that these reefs contained fossils and rock types different from surrounding contemporaneous bedded rocks, and that individual reefs differed among themselves, and, in so doing, pioneered the study of reef paleoecology. In 1877, when Chamberlin, then State Geologist of Wisconsin, published his classic study of Wisconsin Silurian reefs, he focused on the Milwaukee County reef examples, again emphasizing their mound-like structure: "Near Milwaukee there are three mounds or ridges of rock that have attracted much attention, and which seem to be regarded as exceptional phenomena..." [6]

Born on a prairie homestead near Mattoon, Illinois, on September 25, 1843, Chamberlin was only two years old when his family moved to the frontier near Beloit, Wisconsin.[7] After attending the district grammar school, Chamberlin continued his education at Beloit College where he became interested in science under the tutelage of Professor Henry Nason, a well-travelled chemist and mineralogist. Graduating in 1866, Chamberlin taught high school in Delavan, Wisconsin, for two years, and then did graduate work under the geologist Alexander Winchell at the University of Michigan. From 1869 to 1873, Chamberlin taught natural science at the State Normal School in Whitewater, Wisconsin. He then returned to Beloit College as a faculty member, and in 1880, became its first Professor of Geology. While at Beloit, Chamberlin also worked for the Wisconsin Geological Survey, being appointed State Geologist in 1876. He made an exhaustive study of the bedrock and glacial geology of southeastern Wisconsin at this time. The experience he gained in this research made Chamberlin the leading American glacial geologist, and in 1881, Chamberlin was appointed to head the newly formed Glacial Division of the United States Geological Survey, for which he conducted field work across the United States. While continuing his work for the USGS, Chamberlin became president of the University of Wisconsin in 1887, where he is credited with transforming the institution from a college into a university. He left this position in 1892 to establish the Department of Geology at the newly-founded University of Chicago, where he remained until his retirement in 1919. In addition to his reef and glacial work, Chamberlin is noted for his method of multiple working hypotheses, which he formulated while at the University

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[6] T. C. Chamberlain, *Geology of Eastern Wisconsin* (Madison: David Atwood, 1877). p. 365.

[7] The biographical information on Thomas Chamberlin was taken from the following sources: Schultz, S. F. "Thomas C. Chamberlin: the Kettle Moraine and multiple glaciation". *Wisconsin Academy of Sciences, Arts and Letters Transactions*, Vol. 67, pp. 135-148; Chamberlain, R. T. "Thomas Crowder Chamberlain, 1843-1928". *National Academy of Science Biographical Memoir*, Vol. 15, Mem. 11, 1934, pp. 305-407.

of Wisconsin in 1889, and for the planetesimal hypothesis he devised with Forest Moulton at the University of Chicago, which was considered a leading theory for the origin of the solar system at the time of Chamberlin's death in 1928.

During the early twentieth century, several other prominent geologists, including W.C. Alden and Cecil Kindle, also studied the Soldiers' Home Reef, and it was last described in the scientific literature by Robert R. Shrock in his classic 1939 reef study.[8] These geologists all emphasized, in both their field notes and publications, the mound-like appearance of Soldiers' Home Reef in contrast to the surrounding flat-lying rocks more typical for the area.

In addition to its ancient reef origin, its role in the area's glacial history was recognized at this time by Ernst Bruncken. Because of its mound-like reef structure and the erosion-resistant nature of the reef rock, the Soldiers' Home Reef was carved into a *roche moutonée* (glacially abraded rock knob) by glaciers during the Pleistocene Epoch of the Quaternary Period (last geologic time until before the Recent), perhaps during the last stage of glaciation. This is the best undisturbed *roche moutonée* remaining in the area.

Soldiers' Home Reef has remained virtually unchanged for more than 150 years within a large metropolitan area. The two other rock features used to define the important fossil reef concept have been severely altered by quarrying, leaving only the Soldiers' Home Reef as it was when the mid-19th-century geologists visited the area. This is the only remaining site where one may view the actual features originally used by the early geologists to formulate the fossil reef concept, and as such, Soldiers' Home Reef is essential to our understanding of the development of this important geological idea. This historical understanding is critical to refining basic geologic concepts as they change and evolve. The site will also continue to stimulate new studies especially as it has not yet been studied thoroughly using modern methods. Because the other two reefs have been mostly destroyed and covered by urban development, it is also the only intact reef that is accessible for rock-coring and geophysical and seismic studies. Furthermore, by being located within a major metropolitan area and so readily accessible, Soldiers' Home Reef holds exceptional potential for public education in both the history of science and geological phenomena. Soldiers' Home Reef, therefore, contributes fundamentally to our understanding of Earth history and the development of basic geological concepts, and as it continues to be important to fossil reef studies, it may yield important additional information during future study.

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[8] Shrock, R. R. "Wisconsin Silurian bioherms (organic reefs)". Geological Society of America Bulletin, Vol. 50, 1939, pp. 529-562.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

Andreas, A. T. *History of Milwaukee, Wisconsin*. The Western Historical Society, 1881. p. 766.

Bean, E. F. *Increase A. Lapham, geologist*. Wisconsin Archeologist, 1936. vol. 16, p 79-96.

Bleyer, Henry W. *Origin of the Milwaukee Soldiers' Home*. Illustrated News Annual, published by George H. Yenowine, 1892-93. p. 53.

Bruncken, Ernst. *Quaternary deposits and bedrock*. Bulletin of Wisconsin Natural History Society, vol. 1, no. 2, 1900. p. 98-99.

Causier, Charles W. "National Register of Historic Places Inventory Nomination Form--Soldier's Home Reef." Milwaukee, Wisconsin: State Historical Society, 1992.

Chamberlin, T. C. *Geology of Eastern Wisconsin*. Survey of 1873-1877, Volume II. David Atwood, Madison, 1877.

Clarke, John M. *James Hall of Albany, geologist and paleontologist 1811-1898*. Privately printed, Albany. Arno Press Reprint, 1978.

Fenton, Carroll Lane, and Mildred Adams Fenton. *Giants of Geology*. Doubleday & Company, New York, 1952.

Hall, James, and J. D. Whitney. *Report of the Geological Survey of the State of Wisconsin*, Volume 1. 1862. Printed by authority of the State Legislature of Wisconsin.

Lapham, I. A. Miscellaneous correspondence and geological field notes, 1830s-1870s.

Mikulic D. G. and J. Kluessendorf. *Preliminary report on the scientific, educational, and historical importance of the Soldier's Home Reef, Milwaukee County, Wisconsin*. 1991. Submitted to Wisconsin Department of Natural Resources.

Schultz, S. F. *Thomas C. Chamberlin: The Kettle Moraine and multiple glaciation*. Wisconsin Academy of Sciences, Arts and Letters Transactions, vol. 67, 1979. p. 135-148.

Sherman, S.S. *Increase A. Lapham, LL.D., a biographical sketch read before the Old Settlers' Club, Milwaukee News Company Printers*, Milwaukee, 1876.

Shrock, R. R. *Wisconsin Silurian bioherms (organic reefs)*. Geological Society of America Bulletin, vol. 50, 1939. p. 529-562.

Soldier's Home Reef Geological Investigations, Milwaukee, Wisconsin. Submitted to Howard Needles Tammen and Bergendoff. 1992.

Previous documentation on file (NPS):

___ Preliminary Determination of Individual Listing (36 CFR 67) has been requested.
___ Previously Listed in the National Register.
_X_ Previously Determined Eligible by the National Register.
___ Designated a National Historic Landmark.
___ Recorded by Historic American Buildings Survey: #_____
___ Recorded by Historic American Engineering Record: #_____

Primary Location of Additional Data:

_X_ State Historic Preservation Office
___ Other State Agency
___ Federal Agency
___ Local Government
___ University
___ Other (Specify Repository):

10. GEOGRAPHICAL DATA

Acreage of Property: 3.5 Acres

UTM References:

	Zone	Northing	Easting		Zone	Northing	Easting
A	16	420450	4764170	**B**	16	420550	4764230
C	16	420630	4764170	**D**	16	420700	4764050

Verbal Boundary Description:

Soldiers' Home Reef is a rock hill on the south bluff of the Menomonee River valley in the SE1/4, NW1/4. NE1/4, Section 35, T7N, R21E, Wauwatosa Township, Milwaukee 7.5' quadrangle, Clement J. Zablocki Veterans Affairs Center, Milwaukee, Milwaukee County, Wisconsin, approximately 300 feet south of the Milwaukee County Stadium. The boundary follows the north and east face of the reef for approximately 560 feet and then back about 250 feet from that face as shown on the accompanying map, labeled "Soldiers' Home Reef: Veterans' Administration," by Howard, Needles, Tammen & Bergendoff.

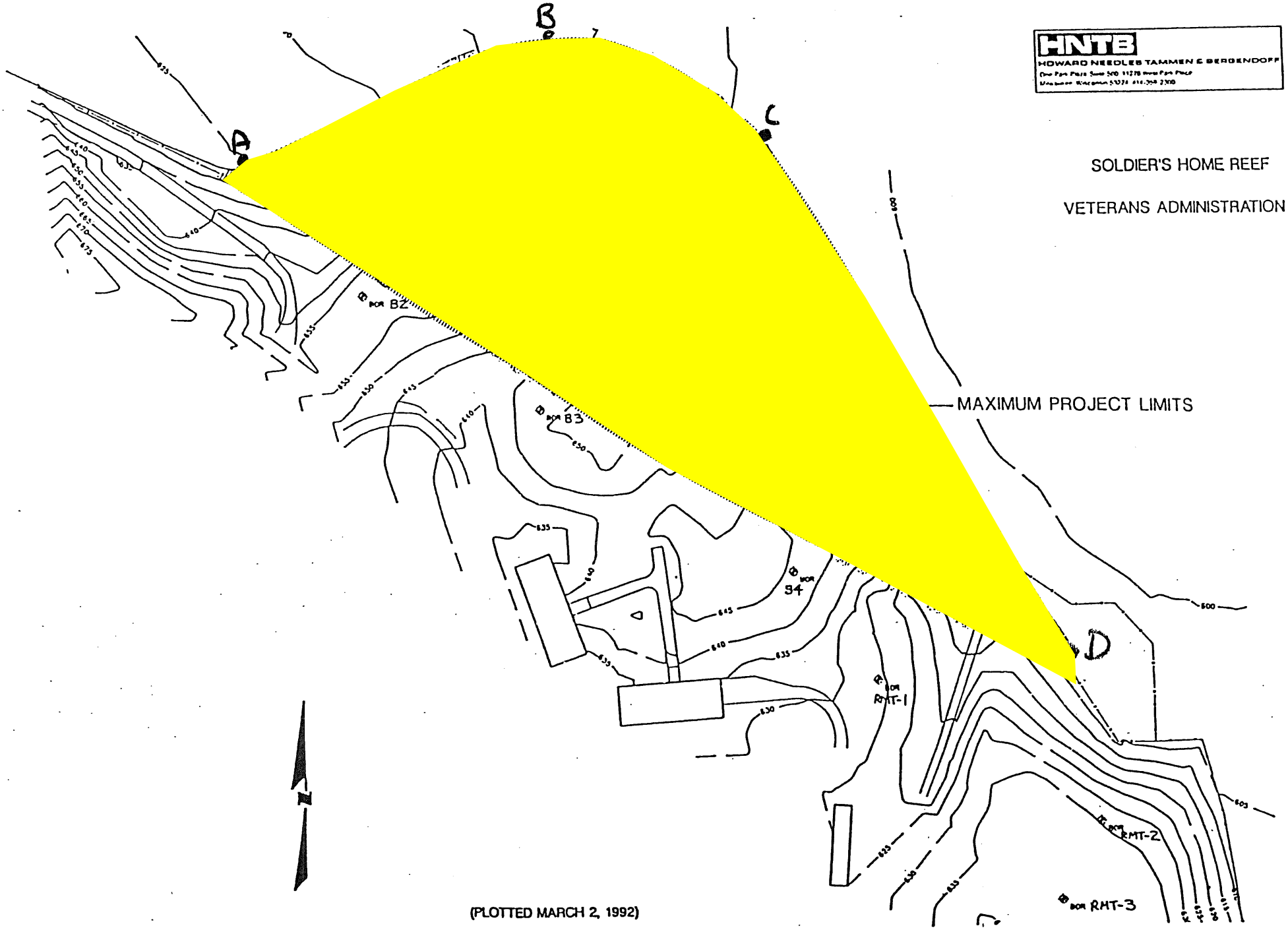
Boundary Justification:

All boundaries except the southern one correspond to the natural edge of the reef outcrop exposed above surrounding ground level. East and west boundaries were selected as they correspond to the topographic boundary of the hill containing the reef. The boundary includes the exposed face of the reef and extends backward a distance likely to include the entire reef structure based on seismic testing.

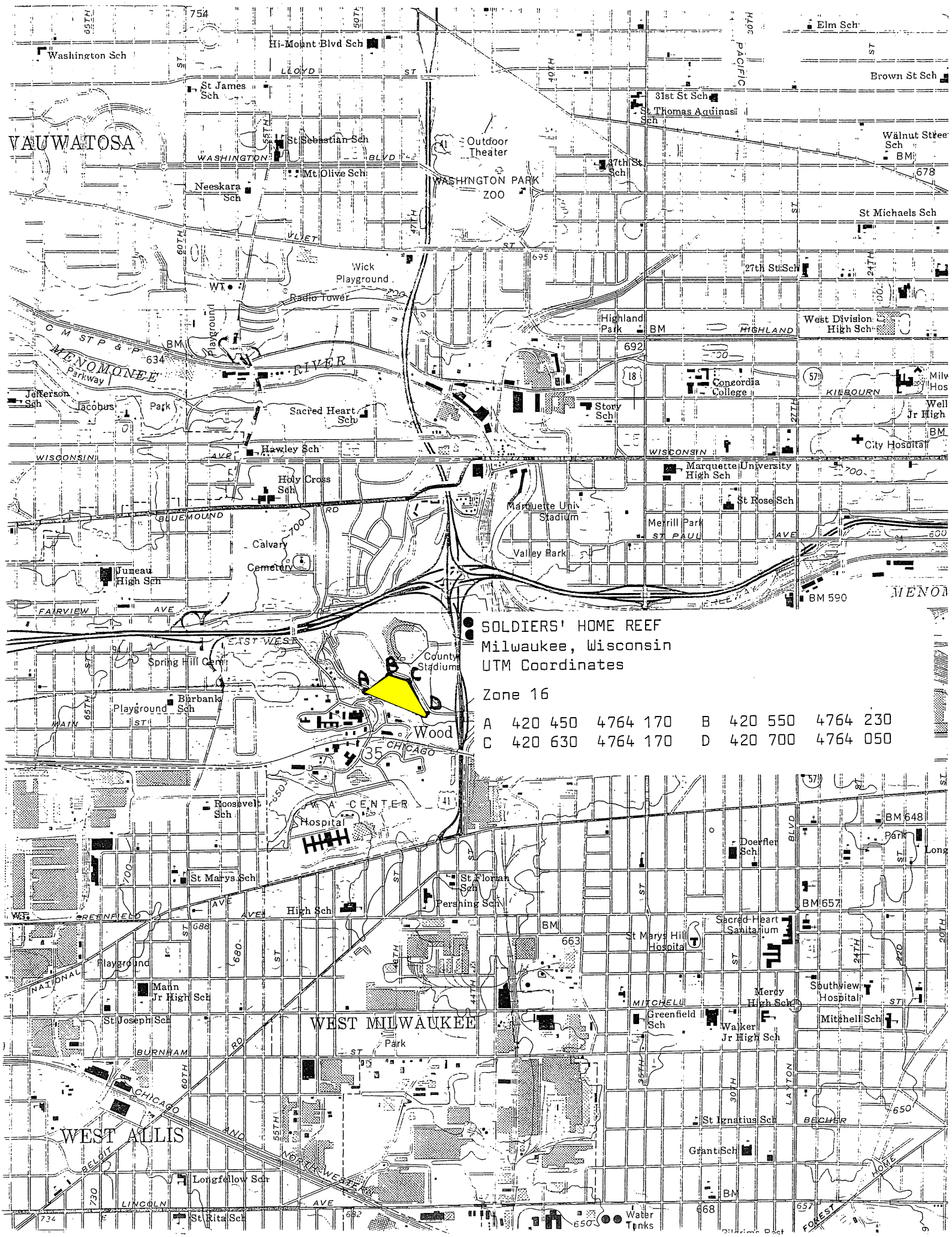
11. FORM PREPARED BY

Name/Title:	Dr. Joanne Klussendorf Dr. Donald G. Mikulic
Org.:	University of Illinois Geology Department
Street/#:	1301 West Green Street 116 West McHenry Street
City/Town:	Urbana, Illinois
State:	Illinois
ZIP:	61801
Telephone:	217/333-1149 (Mikulic) 217/367-5916 (Klussendorf)
Date:	April 1. 1993

Boundaries for the Soldier's Home Reef NHL



(PLOTTED MARCH 2, 1992)


SOLDIERS' HOME REEF
Milwaukee, Wisconsin
UTM Coordinates
Zone 16
A 420 450 4764 170
B 420 550 4764 230
C 420 630 4764 170
D 420 700 4764 050
VAUWATOSA
WEST MILWAUKEE
WEST ALLIS
WASHINGTON PARK ZOO
Outdoor Theater
Washington Sch
Hi-Mount Blvd Sch
St James Sch
St Sebastian Sch
Mt Olive Sch
Neeskara Sch
Wick Playground
Radio Tower
Elm Sch
Brown St Sch
31st St Sch
St Thomas Aquinas Sch
Walnut Street Sch
37th St Sch
St Michaels Sch
27th St Sch
Highland Park
West Division High Sch
Concordia College
Story Sch
City Hospital
Marquette University High Sch
St Rose Sch
Merrill Park
Marquette Univ Stadium
Valley Park
Sacred Heart Sch
Hawley Sch
Holy Cross Sch
Calvary Cemetery
Juneau High Sch
Jefferson Sch
Jacobus Park
Spring Hill Cem
County Stadium
Burbank Sch
Playground
Wood
Roosevelt Sch
Hospital
St Marys Sch
St Florian Sch
Pershing Sch
High Sch
Doerfler Sch
Sacred Heart Sanitarium
St Marys Hill Hospital
Mann Jr High Sch
St Joseph Sch
Greenfield Sch
Walker Jr High Sch
Mercy High Sch
Southview Hospital
Mitchell Sch
Park
St Ignatius Sch
Grant Sch
Longfellow Sch
St Rita Sch
Water Tanks
MENOMONEE RIVER
Parkway
C M ST P & P
WISCONSIN AVE
BLUEMOUND RD
FAIRVIEW AVE
EAST WEST
MAIN ST
GREENFIELD AVE
NATIONAL AVE
BURNHAM ST
CHICAGO AND NORTHWESTERN
LINCOLN AVE
MITCHELL ST
BECHER ST
FOREST HOME
HIGHLAND
KINBOURN
LLOYD ST
WASHINGTON BLVD
VLIET ST
PACIFIC
BELOIT RD
LAYTON
BM 590
BM 648
BM 657
BM 663
BM 668
BM 692
BM 634
BM 678
BM 695
BM 682
BM 650
BM 657
BM 730
BM 734

Soldiers Home Reef
Milwaukee, Wisconsin
View from Northeast
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from Southeast
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from East
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from Southeast
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from Northeast
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
Close-up of North Face
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
Close-up of Southeast Face
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from Southwest (top of Reef)
Photo: C. Causier, February, 1992

Soldiers Home Reef
Milwaukee, Wisconsin
View from West (top of Reef)
Photo: C. Causier, February, 1992