

**United States Department of the Interior**

National Park Service

**National Register of Historic Places Registration Form**

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

**1. Name of Property**Historic name: EMPIRE GEM, shipwreck and remains

Other names/site number:

Name of related multiple property listing:

World War II Shipwrecks along the East Coast and Gulf of Mexico

(Enter "N/A" if property is not part of a multiple property listing)

**2. Location**

Street &amp; number: \_\_\_\_\_ Not Applicable

City or town: Not Applicable State: Offshore: NC County: Offshore: DareNot For Publication:  Vicinity: **3. State/Federal Agency Certification**

As the designated authority under the National Historic Preservation Act, 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. I recommend that this property be considered significant at the following level(s) of significance:

X national          statewide          local

Applicable National Register Criteria:

X A          B          C    X D

Signature of certifying official/Title:

Date

State or Federal agency/bureau or Tribal Government

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

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**Signature of commenting official:**

**Date**

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**Title :**

**State or Federal agency/bureau  
or Tribal Government**

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#### **4. 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:) \_\_\_\_\_

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Signature of the Keeper

Date of Action

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#### **5. Classification**

##### **Ownership of Property**

(Check as many boxes as apply.)

Private:

Public – Local

Public – State

Public – Federal

##### **Category of Property**

(Check only **one** box.)

Building(s)

District

Site

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Structure

Object

### **Number of Resources within Property**

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
_____	_____	buildings
<u>1</u>	_____	sites
_____	_____	structures
_____	_____	objects
<u>1</u>	_____	Total

Number of contributing resources previously listed in the National Register 1

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### **6. Function or Use**

#### **Historic Functions**

(Enter categories from instructions.)

TRANSPORTATION-WATER RELATED

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#### **Current Functions**

(Enter categories from instructions.)

VACANT/NOT IN USE

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## 7. Description

### Architectural Classification

(Enter categories from instructions.)

N/A  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Materials:

 (enter categories from instructions.)

Principal exterior materials of the property: \_\_\_\_\_ N/A \_\_\_\_\_

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### Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

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### Summary Paragraph

See Continuation Sheets

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### Narrative Description

See Continuation Sheets

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## 8. Statement of Significance

### Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B. Property is associated with the lives of persons significant in our past.
- C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D. Property has yielded, or is likely to yield, information important in prehistory or history.

### Criteria Considerations

(Mark "x" in all the boxes that apply.)

- A. Owned by a religious institution or used for religious purposes
- B. Removed from its original location
- C. A birthplace or grave
- D. A cemetery
- E. A reconstructed building, object, or structure
- F. A commemorative property
- G. Less than 50 years old or achieving significance within the past 50 years

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**Areas of Significance**

(Enter categories from instructions.)

DEFENSE-battle site

COMMERCIAL

MARITIME HISTORY

ENGINEERING

ARCHITECTURE

ARCHAEOLOGY-HISTORIC

**Period of Significance**

1941-1942

**Significant Dates**

5/29/1941 (launch)

1/23/1942 (sinking)

**Significant Person**

(Complete only if Criterion B is marked above.)

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**Cultural Affiliation**

N/A

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**Architect/Builder**

Harland and Wolff, Ltd., Glasgow, Scotland (builder)

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**Statement of Significance Summary Paragraph** (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

See Continuation Sheets

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**Narrative Statement of Significance** (Provide at least **one** paragraph for each area of significance.)

See Continuation Sheets

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## 9. Major Bibliographical References

**Bibliography** (Cite the books, articles, and other sources used in preparing this form.)

See Continuation Sheets

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**Previous documentation on file (NPS):**

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # \_\_\_\_\_
- recorded by Historic American Engineering Record # \_\_\_\_\_
- recorded by Historic American Landscape Survey # \_\_\_\_\_

**Primary location of additional data:**

- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other

Name of repository: NOAA/Monitor National Marine Sanctuary

**Historic Resources Survey Number (if assigned):** \_\_\_\_\_

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## 10. Geographical Data

**Acreage of Property** 61.77635

Use either the UTM system or latitude/longitude coordinates

### Latitude/Longitude Coordinates

Datum if other than WGS84: \_\_\_\_\_  
(enter coordinates to 6 decimal places)

1. Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

2. Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

3. Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

4. Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

**Or**

### UTM References

Datum (indicated on USGS map):

NAD 1927    or     NAD 1983

1. Zone: \_\_\_\_\_ Easting: 456772 Northing: 3876786

2. Zone: \_\_\_\_\_ Easting: 456772 Northing: 3876286

3. Zone: \_\_\_\_\_ Easting: 456272 Northing: 3876286

4. Zone: \_\_\_\_\_ Easting : 456272 Northing: 3876786

### Verbal Boundary Description (Describe the boundaries of the property.)

The EMPIRE GEM rests offshore of Cape Hatteras, NC at a depth of 150 feet. The vessel's remains lie in United States' federal waters within four miles of the boundary of the National Oceanic and Atmospheric Administration (NOAA) Monitor National Marine Sanctuary. UTM coordinates for EMPIRE GEM are 456522 E 3876536 N. This location marks the center of the property. The 61.77635 acre site (a square 500 meters per side with boundary coordinates: NE: 456772 E 3876786N, SE: 456772 E 3876286N, SW: 456272 E 3876286 N, NW: 456272 E 3876786N), includes the main hull structure and debris field surrounding the tanker.

### Boundary Justification (Explain why the boundaries were selected.)

The National Register boundaries of the EMPIRE GEM shipwreck encompass the footprint of its articulated remains within a square (500 meters per side) to capture debris and artifacts that are separated

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from the main structure. Multibeam sonar surveys conducted by NOAA's Monitor National Marine Sanctuary revealed the extents of the centralized structure surrounded by scattered debris set apart from the main structure.

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### 11. Form Prepared By

name/title: Deborah Marx, Maritime Archaeologist and James Delgado, Ph.D., Director of Maritime Heritage  
organization: NOAA/Office of National Marine Sanctuaries  
street & number: 1305 East West Hwy Building: SSMC4  
city or town: Silver Spring state: MD zip code: 20910  
e-mail Deborah.Marx@noaa.gov  
telephone: 781-545-8026 ex 214  
date: 7/15/13

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### Additional Documentation

Submit the following items with the completed form:

- **Maps:** A USGS map or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

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### Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

### Photo Log

Name of Property: EMPIRE GEM, shipwreck and remains

City or Vicinity: N/A

County: Offshore Dare County

State: NC

Photographer: United States Coast Guard

Date Photographed: 13 November 1941

Description of Photograph(s) and number: EMPIRE\_GEM\_001

EMPIRE GEM in 1941, port side profile view.

Image Source: National Archives. Records of the United States Coast Guard Office of Operations, Intelligence and Security Division, Merchant Vessels Information Files, 1939-52. Empire Cormorant to Empire Guinevere. RG 26. Box 50. National Archives. Washington, DC.

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Name of Property: EMPIRE GEM, shipwreck and remains

City or Vicinity: N/A

County: Offshore Dare County

State: NC

Photographer: United States Coast Guard

Date Photographed: 1942

Description of Photograph(s) and number: EMPIRE\_GEM\_002

EMPIRE GEM in 1942, sinking.

Image Source: National Archives. Records of the United States Coast Guard Office of Operations, Intelligence and Security Division, Merchant Vessels Information Files, 1939-52. Empire Cormorant to Empire Guinevere. RG 26. Box 50. National Archives. Washington, DC.

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Name of Property: EMPIRE GEM, shipwreck and remains

City or Vicinity: N/A

County: Offshore Dare County

State: NC

Photographer: National Oceanic and Atmospheric Administration (NOAA)

Date Photographed: June 2011

Description of Photograph(s) and number: EMPIRE\_GEM\_003

High resolution multibeam image of the EMPIRE GEM, shipwreck and remains.

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**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

**Estimated Burden Statement:** Public reporting burden for this form is estimated to average 100 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

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**Continuation Sheet**Section number 7 Page 1**EMPIRE GEM, shipwreck and remains****Name of Property**

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**County and State**World War II Shipwrecks along the East  
Coast and Gulf of Mexico**Name of multiple listing (if applicable)****Section 7 – Narrative Description****SUMMARY**

EMPIRE GEM is the remains of a steel-hulled British tanker carrying a cargo of kerosene that was torpedoed on 24 January 1942 by the German U-boat U-66. The shipwreck lies in over 150 feet of water 12 miles off Cape Hatteras, North Carolina nearby to the boundary of NOAA's Monitor National Marine Sanctuary. EMPIRE GEM's extant remains consist of its hull and machinery, broken in two on the seafloor. Its stern section sits upright with a list to starboard and its bow section is upside down. The vessel's stern is rotated 180 degrees from its original orientation with the stern post now facing the break on the larger bow section. Holes in the hull allow access to the machinery space and lower decks including its engine room.

**SETTING**

EMPIRE GEM lies partially buried in a flat sand/mud plain on the continental shelf southeast of the Cape Hatteras, North Carolina. The seafloor is comprised of sand, shell hash, and clay with only a slight slope to the southeast. The shipwreck lies near the western margin of the Gulf Stream resulting in seasonal changes in current velocity and direction. The EMPIRE GEM has taken on an ecosystem role as hard substrate for encrusting invertebrates as well as a variety of fish and shark species. The shipwreck is now home to a diverse array of marine life from sponges to manta rays.

EMPIRE GEM sits within an area that became one of the main operating zones of Operation Drumbeat during World War II. The ship is 1 of 61 ships and 4 U-boats sunk off North Carolina during the Battle of the [Western] Atlantic between 1942 and 1945. These wrecks comprise, collectively, an underwater battlefield for one of the most decisive naval engagements of World War II in American waters, which was part of the overall "Battle of the Atlantic." This battle pitted German U-boats against vessels trading with the United States during the war. The ships involved included U.S.-flagged as well as foreign-flagged vessels, all engaged in transporting the industrial and mineral output of the United States in a time when the U.S. was engaged in the global conflict of 1939-1945. The ships sunk in that battle, like EMPIRE GEM, are part of the collective record of the battle and its participants, both warship and merchant vessel.

**DESCRIPTION**

The following description of EMPIRE GEM's archaeological remains is based on a multibeam sonar survey conducted by NOAA's Monitor National Marine Sanctuary in June 2011 as well as recreational diver reports. Divers have visited the EMPIRE GEM for many years and their observations are published in popular dive guides and shipwreck books as well as on the internet. This information supplements the archaeological data gathered from the multibeam sonar survey and provides details not captured by the remote sensing equipment. The sunken vessel's size, observed site characteristics, and location all indicate that the site is the British tanker EMPIRE GEM.

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The EMPIRE GEM's overall site measured 515 feet long by 210 feet wide with 30 feet of vertical relief above the seafloor. The site's main feature is the vessel's steel hull, which lies broke in two pieces. The bow section measured 262 feet long, while the stern section measured 140 feet long. Whereas the bow section is completely upside down, the stern section sits upright. However, the stern section is rotated 180 degrees from its original orientation, and now the vessel's sternpost points directly at the broken end of the bow section. The shipwreck's longitudinal axis is oriented east northeast by west southwest, its bow points east northeast.

The EMPIRE GEM's most prominent feature is its upright stern section that lists to the northwest. Its four-bladed propeller and rudder sections are intact, but partially buried in the sediment. The fantail retains its curvaceous shape and holds the steering quadrant and large deck fittings. The EMPIRE GEM's rent hull provides divers access to its engine space. Deterioration of the vessel's steel hull has exposed its two inline diesel engines that sit fore and aft on the centerline. A single iron boiler used to generate steam for machinery and pumps is also located in the stern section (Hudley 2007; Gentile 1993:72; Dive Hatteras LLC 2008).

EMPIRE GEM's decks have collapsed in some areas, but sufficient structural integrity remains to allow divers to penetrate and explore portions of the lower decks and internal machinery compartments. Approximate twenty five feet forward of the engines, the stern section ends where the EMPIRE GEM broke in half as a result of the explosion from the U-66's two torpedoes. A debris field extends towards the southwest from the stern section's broken end consisting of twisted metal plating and portholes. The tanker's four inch naval gun and gun platform rest on the seafloor off the south side of the wreck between the bow and stern sections. EMPIRE GEM's wheelhouse is also located on the sand off the stern (Gentile 1993:72).

EMPIRE GEM's bow section is the largest component on the site and encompasses 75% of the wreck structure. Less information about this area can be gleaned from diver reports as it is visited infrequently due to its unbroken outer hull that prevents diver penetration. The tankers unbroken bow may possibly contain unbroken cargo tanks loaded with kerosene. The tanker's fuel bunkers were also located at the bottom of the hull in the bow and may contain fuel oil. Both of the vessel's bow anchors lie in the sand near the bow and were deployed following the torpedo hits. The cutwater rises twenty feet off the bottom and the hull slants down to the seafloor toward the athwartships break. Divers report the strong smell of petroleum products when visiting the shipwreck (Dive Hatteras LLC 2008; Gentile 1993:71-72).

Overall, the site can be characterized as a large steel-hulled tanker broken in half just forward of the engineering space. The wreck's location matches historical accounts of EMPIRE GEM's loss of Cape Hatteras, North Carolina. Additionally, the shipwreck's size and construction features correspond to EMPIRE GEM's historically reported characteristics.

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**SITE INVESTIGATIONS**

NOAA's Monitor National Marine Sanctuary staff initiated the archaeological examination of the EMPIRE GEM in June 2011. Partnering with Advanced Underwater Surveys, LTD (ADUS), the team used high resolution multibeam sonar mounted on an autonomous underwater vehicle (AUV) to conduct a close order survey of the EMPIRE GEM to archaeologically characterize the site. The multibeam sonar used high-frequency sound to image the shipwreck and produce digital "point cloud" images of the site. The images depicted a shipwreck broken in two with an inverted bow section. The vessel's hull was determined to be structurally sound aside from the torpedo impact zone. The project sought to answer research questions about the site's characteristics and integrity, the extent of the site, level of anthropogenic impacts to the site, as well as assessing the site's potential to hold hazardous oil cargo. Additional surveys of the EMPIRE GEM are planned to continue the site assessment and archaeological analysis.

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**Section 8 – Statement of Significance**

**SUMMARY**

The archaeological remains of the EMPIRE GEM are significant at the national level under criteria A; the shipwreck is associated with events that have made a significant contribution to the broad patterns of our history and criteria D; the shipwreck has yielded or may be likely to yield, information important in history or prehistory. EMPIRE GEM will provide information on merchant shipping during World War II, Axis military actions off the United States during World War II, merchant vessel design and use, merchant vessel cargo transport, shipboard life, and its wrecking event.

Merchant Shipping along the United States during World War II (criteria A)

EMPIRE GEM operated as a merchant vessel during World War II supplying the Allies with valuable petroleum products to fuel the war machine. It exemplifies the importance of ordinary merchant vessels, such as freighters and tankers, to supply industrialized nations with commodities in times of crisis. EMPIRE GEM braved the waters off the United States and across the Atlantic to England to fulfill the need of Allied nations for oil. EMPIRE GEM was connected to the larger merchant shipping network during World War II that moved goods around the world. EMPIRE GEM, alongside other merchant vessels, connected and unified Allied countries that rallied together to pool resources to defeat the Axis powers during World War II.

Axis (U-boat) Military Actions off the United States in World War II (criteria A)

EMPIRE GEM's loss is a representative example of the U-boat campaign off the United States during World War II. Operation Drumbeat directly attacked Allied merchant shipping up and down the East Coast and in the Gulf of Mexico between 1942 and 1945. EMPIRE GEM fell prey to two torpedoes from the German submarine U-66 and its remains now sit at the bottom of the ocean testament to a fierce battle just off the American shore. Its' physical remains are directly connected to and associated with the U-boat actions during World War II. The EMPIRE GEM's rent hull visibly portrays the moment in time when the U-66's torpedo exploded sending the vessel to the bottom and sealing its fate as a casualty of war.

Vessel Design, Use, and Adaptation (criteria D)

EMPIRE GEM was purpose-built to transport bulk petroleum products as a tanker. Since it was constructed after the outbreak of World War II, during a time that the German navy was engaged in commerce raiding, there is question as to whether it was designed to operate in U-boat infested waters. EMPIRE GEM's single naval gun and various other armaments suggested that various modifications were made to protect its crew in the event of an enemy attack. However, the most effective U-boat deterrent strategy was sailing in a convoy. No archival information is available to indicate whether the EMPIRE GEM's was specially outfitted to sail in convoys or if its hull or machinery was strengthened or

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changed to accommodate the weaponry. Additionally, archaeological survey work may provide evidence of how the EMPIRE GEM was built to operate during war time conditions.

Merchant Cargo Transport (criteria D)

Archaeological analysis of the EMPIRE GEM will yield information about what the tanker was transporting as well as how the material was stored. It will also reveal if the EMPIRE GEM was carrying any other materials besides its official cargo of kerosene. It is possible that EMPIRE GEM was transporting additional war related goods that were not declared on the reports chronicling its loss. Archaeological documentation of EMPIRE GEM's hull shape, tank configuration, deck structures, and engine compartment will provide data on the evolution of tankers and merchant cargo transport.

Shipboard Life (criteria D)

Documentation of the EMPIRE GEM's material culture will yield information about its crew and answer questions about ethnicity, social class, and shipboard life. EMPIRE GEM's crew was forced to quickly flee the sinking vessel, leaving their personal effects behind. The information gathered from analysis of the crew's effects will likely provide insight into life onboard an Allied merchant vessel operating in an active U-boat battlefield. EMPIRE GEM's crew consisted of 57 men from the United Kingdom whose nationalities were English, Scottish, Welsh, and Irish. The crew's length of individual service ranged from 32 years for the captain to an engineer on his first sea voyage. Crewmembers ranged in age from 57 years old for its donkeyman (boilerman or mechanic) to 16 for an apprentice. Only two crewmen survived the EMPIRE GEM's wrecking, its captain Francis Reginald Broad, and its second radio officer, Thomas Orrell. Both were given awards from the British Merchant Navy for their courage and heroism during the EMPIRE GEM's sinking.

Wrecking Event (criteria D)

Newspaper stories covered very little about the events surround EMPIRE GEM's sinking off Cape Hatteras, North Carolina. In fact, there are no articles about the EMPIRE GEM's loss right after the event in any major newspapers of the time. The only mention of the tanker's loss was printed several months later and minimal information about the event were covered. Primary source documents from the Coast Guard and Navy housed at the National Archives also do not record the incident in much detail. Due to the war time orders, newspapers limited their reports on merchant vessel losses. Therefore EMPIRE GEM's wrecking event was not adequately recorded in the historical record. The site's archaeological remains will shed light on its sinking and U-boat operations during Operation Drumbeat. Archaeological investigation of the shipwreck's hull, machinery, cargo, and cultural artifacts may provide information that will confirm or contradict historical reports recorded from the vessel's crew. One of the research questions that archaeological survey will solve is whether the EMPIRE GEM's last cargo gasoline or kerosene.

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**HISTORICAL SIGNIFICANCE**

The tanker EMPIRE GEM was built in Glasgow, Scotland by Harland and Wolff, Ltd. and launched on 29 May 1941. It measured 463.2 feet long, 61.2 feet wide, with a 33.1-foot depth of hold. Its gross and net tonnage was 8,139 tons and 4,743 respectively with an under deck tonnage of 7,234 tons. The builder's identification yard number was 1045G. Its official number was 168691 and its signal letters were BCNV. It was a single screw, steel hulled, two decked motorship designed to carry petroleum in bulk. EMPIRE GEM was the sister ship to the *Dingledale* (yard number 1044G). EMPIRE GEM was built under a Lloyd's special survey and had an A1 rating vessel meaning it was fit to carry dry and perishable goods. It had a cruiser stern with three deck structures, the poop at the stern, bridge in the middle and foc'sle at the bow. Four 24 or 25-foot long boats were placed on deck to serve as lifeboats. The vessel was constructed with electric lights, wireless radio, a direction finder, and an echo sounding device (Lloyd's Surveyor Report 1941; *Lloyd's Register of British and Foreign Shipping 1943*: EMP).

Harland and Wolff built EMPIRE GEM with a steel riveted hull and longitudinal steel framing in its bottom with transverse framing located in the poop and foc'sle. At amidships the framing was spaced 31 inches apart. The engine room was strengthened with a double bottom combined with transverse frames. It had seventeen watertight bulkheads extending up to its upper deck. J. Hastie and Co. supplied a steam hydraulic steering gear for the vessel with block and tackle on hand as an alternative method if steam pressure was lost. The steam windlass was manufactured by Emerson Walker (Lloyd's Surveyor Report 1941).

EMPIRE GEM employed water for ballast in several onboard tanks. There were ballast tanks fitted under the engines in its double bottom, in cofferdams under the engines, as well as in the fore peak tank, aft peak tank, and forward deep tank (Lloyd's Surveyor Report 1941). Water ballast was common in vessels that had both full and light (in ballast) loads. This system ensured that the ballast did not take up area any that could be used for cargo in turn maximizing cargo storage (Pollock 1884:15).

Harland and Wolff built EMPIRE GEM's two heavy oil airless injection engines. The engines were powered by fuel oil stored in aft oil bunkers with additional storage in deep tanks forward. The four stroke, eight cylinder, single acting engines produced 502 nominal horsepower. The vessel was equipped with two steel, single ended return tube boilers, which supplied steam for a donkey engine, auxiliary engines, compressors, and steering equipment. The boilers ran on the same fuel oil as the main engines with 150 pounds per square inch of pressure. The tanker's two electric generators ran off the auxiliary steam engine and each produced 110 volts, 20 kilowatts, and 182 amps with 650 revolutions per minutes. All the EMPIRE GEM's machinery was built under a special survey in accordance with plans approved by (Lloyd's Surveyor Report 1941).

Harland and Wolff ran two shipyards, the Queen's Island yard in Belfast, Ireland and the Govan yard in Glasgow, Scotland. EMPIRE GEM was built in the Govan yard, which was originally founded in 1841 by Robert Napier. Napier had started out only building marine engines, but eventually expanded his business to include both hulls and machinery. When Napier died in 1876 his business was taken over by

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William Beardmore and Company, which used the space until 1905. Napier's Govan yard sat unoccupied until 1909 when it was acquired by the London and Glasgow Company and eventually Harland and Wolff in 1912. Harland and Wolff acquired three neighboring properties and expanded the Govan yard making it a major player in the British Ministry of War Transport's war time shipbuilding program. Harland and Wolff sold their Govan property to the Glasgow Corporation in 1965 (Mitchell and Sawyer 1990:80-81).

During EMPIRE GEM's outfitting after its launch, the British Ministry of War Transport equipped it with defensive weaponry to assist its crew in an event of an attack by Axis powers. Most merchant vessels that operated during World War II were furnished with some sort of armament to combat the U-boat threat and the EMPIRE GEM was well supplied during its entire career as a petroleum tanker. It carried gear to combat aerial and submarine threats as well as impacts from undersea mines. The largest weapon onboard was a B.L. 4 inch MK VIII (No. 971) naval gun mounted on its stern on a platform above its poop. This was mainly used as an anti-torpedo or anti-submarine gun. Fifteen feet behind that was a twelve pounder Q.F. MK IX (No. 6961) gun. Small arms consisted of 4 Marlin 0.30 caliber machine guns, 2 Savage Lewis 0.30 caliber guns, and one Lee Enfield 0.303 caliber rifle. EMPIRE GEM carried degaussing gear to reduce the hull's magnetic signature, thus lessening the risk of triggering a magnetic mine. The ship carried two paravanes, towed underwater devices deployed from the ship's side by the yardarms, to neutralize contact mines. Paravanes cut a mine's anchor cable causing it to surface where it could be destroyed. Additional supplies included kites, smoke floats, flares, igniters, port fires, P.A.C. rockets, protective clothing, steel helmets and gas masks (National Archives United States Coast Guard RG 26 box 50; Stirling 1941:108).

EMPIRE GEM's outfitting was completed and it went into service as a petroleum tanker on 24 October 1941. The tanker was built for the British Ministry of War Transport and managed by the British Tanker Company (a predecessor of British Petroleum or BP). The British Ministry of War Transport was part of the British government formed in May 1941 to control transportation policy and resources. The agency merged the Ministry of Shipping and the Ministry of Transport to better organize wartime transport. Its U. S. equivalent was the War Shipping Administration (WSA), which worked to maximize the merchant marine efforts in support of Allied fuel and supply needs at home and abroad. Representatives of the British Ministry of War Transport were stationed all over the world to ensure coordination between countries.

One of the first acts of the British Ministry of War was the requisition of all British tonnage no matter the vessel's size; however, management and operation of the ships was left in the owner's hands who acted as an agent for the Ministry of War. Ships were directed by the Ministry and the vessel's owner was paid a hire rate based on tonnage. The owner received no financial compensation for the value of the vessels freights or fares (*Sydney Morning Herald* 28 February 1946). Similar to the policies of the WSA, the British Ministry of War Transport initiated a shipbuilding program to expand the fleet and counter merchant vessel losses by U-boat.

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Before the second World War, Great Britain, with 15 million gross tons or 30 per cent of the world ocean going tonnage, held undisputed supremacy, while the United States, with 8.5 million gross tons, was a poor second. During the war, the volume of shipping under the British flag has diminished almost continuously, despite extensive purchases of foreign-owned (largely American) vessels, while Allied, Axis, and neutral shipping has also declined, though at a less rapid rate (Adler 1944:193).

British government policies had previously exerted minimal control, interference or subsidization of the merchant shipping industry aside from shipbuilding, which was supported through construction loans (Adler 1944:199). During the war, the loan program did not stimulate enough shipbuilding to keep up with the high rate of British vessels vessel losses. The Ministry of War Transport stepped in and spurred on the construction of new merchant ships. Merchant ships were built two ways, either by direct orders from the British government or by issuing licenses/contracts to companies to construct ships built to war time specifications for private owners (Mitchell and Sawyer 1990:2). The British government used the first method most frequently, taking on complete oversight over construction of ships that were in turn leased to private operators. Through this process, the government could ensure that enough specialized vessels, such as the tanker EMPIRE GEM, were active in the fleet and available for war duty (Adler 1944:201).

EMPIRE GEM was one in a series of vessels known as “Empire” ships built expressly for the British government in response to World War II. In 1939, the Ministry of Shipping adopted a standard naming system for all merchant ships contracted by the government to be built in Britain. The prefix Empire was given to all the ships except very small types. This system applied to vessels acquired through purchase, requisition, or taken as a war prize. The Empire name also included tramp merchant ships acquired from the U. S. in 1941-42. Modern C2 and C3 type ships on Lease/Land agreements to the United Kingdom during the late 1941-42 received the moniker. Even thirteen C1-type ships that were converted to British Infantry Landing Ships in 1943-44 went by “Empire ...” (Mitchell and Sawyer 1990:vii). Britain did not keep all its Empire ships, many Empire ships were transferred to Allied nations after 1941 to counteract the loss of shipping associated with enemy occupation. Britain transferred merchant ships to Belgium, the Netherlands, France, Norway, and Poland (Mitchell and Sawyer 1990:4-6).

The EMPIRE GEM and its sister ship the *Dingledale* were in the first wartime orders at Harland and Wolff's Govan facility. The EMPIRE GEM was for the British Ministry of War Transport while the *Dingledale* was for the Admiralty and served as a tanker for the Royal Fleet Auxiliary (the *Dingledale* was not given Empire in its name because Admiralty tankers used the Dale nomenclature). The other vessels in the first order were three smaller fleet oil carriers, the HMS *Black Ranger*, HMS *Blue Ranger*, and HMS *Brown Ranger* (Moss and Hume 1986:134, 324).

In the book *Empire Ships*, authors W.H. Mitchell and L. A. Sawyer list 62 builders of Empire Ships including EMPIRE GEM's builder, Harland and Wolff's Govan shipyard. In total the Harland and

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Wolff's Govan yard built 21 government Empire ships and 11 vessels under private government contract or license. Empire ships built over overseen by the British Ministry of War Transport typically included tramps, deep sea tankers, aircraft carriers (CAM-MAC ships), fast cargo liners, heavy lift ships, Scandinavian type cargo ships, colliers, dry cargo coasters, coastal tankers, tugs, dredges and hoppers, tank landing ships, ferries, water carriers, ore carriers, and convoy rescue ships (Mitchell and Sawyer 1990:v).

Starting in 1940, Harland and Wolff's Govan operation focused on building merchant ships (Moss and Hume 1986:329). The yard's specialty during World War II was the deep sea tanker, designed to ferry liquid cargo across the world's oceans. Harland and Wolff's Govan shipbuilders constructed 6 Empire tankers and 6 private tankers. These vessel's fell into several classes of tankers included ocean-type, ocean-type (Admiral Dale class), standard fast-type (Admiral Wave class) and Empire Pym type.

EMPIRE GEM was an ocean-type tanker and was the first of 6 total Empire ocean-type tankers launched by Harland and Wolff's Govan shipyard between January 1940 and December 1945. The other tankers were *Empire Onyx*, *Empire Vigilance*, *Empire Metal*, *Empire Grenada*, and *Empire Jupiter* (Mitchell and Sawyer 1990:140). The six Empire ocean-type tankers were owned by the British Ministry of War Transport and were managed by the British Tanker Company or sold before completion (Moss and Hume 1986:538-546).

Name	Builder Number	Gross Tonnage	Dimensions (LxW) in feet	Launched	Completed	Owner/Manager	Fate
<i>Empire Gem</i>	1045G	8,139	463.2 x 61.2	5/29/1941	10/24/1941	British Ministry of War Transport (manager: British Tanker Co)	Sunk by German U-boat off NC 1/24/1942
<i>Empire Onyx</i> (renamed <i>Nortind</i> )	1083G	8,221	465.6 x 59.5	8/21/1941	12/25/1941	British Tanker Co (1941), Norwegian Govt (1942)	Sunk by German U-boat off Greenland 1/26/1943
<i>Empire Vigilance</i> (renamed <i>British Vigilance</i> )	1116G	8,093	463.2 x 61.2	2/18/1942	5/23/1942	British Tanker Co	Sunk by German U-boat in Atlantic Ocean 1/24/1943
<i>Empire Metal</i>	1160G	8,201	465.6 x 59.5	6/30/1942	9/24/1942	British Ministry of War Transport	Sunk in Algeria 2/1/1943 and later scrapped
<i>Empire Grenada</i> (renamed <i>British Piper</i> )	1197G	8,231	465.6 x 59.5	12/20/1945	4/11/1946	British Ministry of War Transport (manager: British Tanker Company) (1946), BP Tanker Co (1956)	Scrapped 10/1961
<i>Empire Jupiter</i> (renamed <i>Saint Gaudens</i> , <i>Sevane</i> , <i>Progress</i> )	1243G	8,217	465.6 x 59.5	9/21/1944	12/29/1944	Govt of France(1946), Les Petroles d'Outre-Mer (France) (1948), Yugoslavia Tankerska Plovidba (Yugoslavia)(1958)	Scrapped 9/1970

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Table 1. Empire ocean-type tankers launched by Harland and Wolff's Govan shipyard between May 1941 and September 1944. (Mitchell and Sawyer 1990:140).

Thirty-four ocean-type tankers were launched by seven different British shipyards beginning in 1941 (Gardiner 2000:69). The typical Empire ocean-type tanker (based on the Shell design) was 466 feet long, had a continuous sheer, and was set up with its diesel engine, boilers, smoke stack, and crew's quarters at the stern. The deckhouse at the vessel's center housed the pilothouse/bridge, captain's cabin, and officer's quarters as well as general storage. Nine below-deck tanks stored oil or petroleum products with additional tanks at the bow for water ballast, fuel oil, and storage. Several deck derricks facilitated the movement of cargo and supplies (Dunn 1956:84; Mitchell and Sawyer 1990:135). These tankers could carry a variety of petroleum products including crude oil, fuel oil, gasoline, casing head gas, kerosene, or lubricating oil.

In addition to the six Empire ocean-type tankers, Harland and Wolff's Govan shipyard also built 6 ocean-type tankers for private companies under contract with the British government. The tankers were owned by the British Tanker Company, Anglo-Saxon Petroleum Company, or Eagle Oil Shipping Company and ranged from 8,093 to 8,246 gross tons (Moss and Hume 1986:538-546). The other Harland and Wolff yard at Queens Island in Belfast, Ireland also participated in the war time tanker shipbuilding enterprise. The Belfast yard built 9 Empire ocean-type tankers and 7 private tankers (Moss and Hume 1986:538-546).

Prior to World War II British tankers fell into two categories, those that worked for the major oil companies and serviced common routes and those that operated as tramp oil tankers operated by private companies that chartered their vessels as needed to oil companies (Mitchell and Sawyer 1990:134). At the outbreak of World War II, the transportation of petroleum products in bulk took on an even more significant role as a matter of national security. "The tanker has become indispensable to the progress of mankind" (Morrell 1931:vii). Petroleum products were needed for lighting, lubrication, and for powering vehicles, planes, marine and industrial plants. A single tanker with a cargo of 10,000 tons, the same capacity as the EMPIRE GEM, provided more than 22 million horsepower-hours or over 400,000 million British thermal units (Morrell 1931:vii).

"Oil was the lifeblood of Britain's war machine; the Royal Navy, Royal Air Force and the mechanized armies depended on it, as did the many factories engaged in war production. Practically all refined oil products had to be brought to Britain and the tanker was special to that single purpose" (Mitchell and Sawyer 1990:134).

Great Britain did not have sufficient oil reserves at home during World War II; therefore the transportation of the cargo was vitally important as reflected by the government's active role in shipbuilding and shipping. The EMPIRE GEM served as a key asset to the Allied war effort, which included the United States, its ships and its products as a vital – if not the most vital - aspect. The British Tanker Company, a subsidiary of the British Petroleum Company (BP) managed the EMPIRE GEM to achieve its potential for the citizens of the United Kingdom. BP's roots go back to 1901 when a wealthy

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Englishman, William Knox D'Arcy, obtained a concession from the Shah of Iran to explore and exploit his country's oil reserves. In 1908 Knox's crew discovered the first commercial quantities of oil in Iran and started the path of Middle East's dominance in the oil market. Before that Russia and the United States were the main oil producing nations. In 1909 the Anglo-Persian Oil Company, a subsidiary of the Burmah Oil Company, was formed to profit off Iran's rich oil fields. In 1914, just before World War I, the British government contracted with the Anglo-Persian Oil Company to supply their Admiralty with oil. This move injected millions of pounds into the growing company and allowed them to focus on making bulk deliveries of a single type of product to a single customer (Bamberg 1994:3-5).

In 1915, the Anglo-Persian Oil Company formed a maritime transportation subsidiary, the British Tanker Company, to begin the movement of oil from the Middle East to the United Kingdom. The company first contracted out this service, but shortly came to the realization that it would be better served if it owned and operated its own fleet (Bamberg 1994:6). British Tanker Company built a fleet of seven oil tankers in 1916 that all had the prefix "British" in their names due to the subsidy from the British government for the backing of this venture. All future additions to the fleet followed the same naming convention. Their first tanker, the *British Emperor*, measured 5,500 tons, 345 feet long by 49.1 feet wide. Armstrong Whitworth Company Limited in Newcastle-upon-Tyne launched the vessel in September 1916 with seven main port and starboard tanks, a summer tank, and forward cargo hold. The other six vessels were *British Princess*, *British Sovereign*, *British Ensign*, *British Isles*, *British Empress*, and *British Admiral*. The British Tanker Company continued to build or acquire more vessels to increase their worldwide distribution capabilities. Upon the outbreak of World War I, the British government seized the company's assets. Ultimately, the British Tanker Company only lost two ships during the conflict possibly due to the fact that their oil distribution network was largely Germany controlled. After the war the British Tanker Company resumed normal activities and purchased several surplus government-owned tankers (Harvey and Solly 2005:10-11).

In 1920, the various companies soon to be called British Petroleum consisted of the following entities. The Anglo-Person Oil Company was the governing body and responsible for marketing, financing, exploration, and operation of a fleet of service vessels. The British Tanker Company was responsible for operating long haul tankers and vessel management inside and outside the group. The Petroleum Steamship Company operated numerous service craft such as barges and tugs. The British Petroleum Company concentrated on marketing in the United Kingdom. Finally, the British Oil Bunkering Company operated bunkering vessels around the United Kingdom (Harvey and Solly 2005:11). The British Tanker Company grew considerably in size. By 1928 the fleet numbered 82 vessels and by 1939 they owned 92 tankers (Bamberg 1994:137). In 1935 the Anglo-Persian Oil Company became the Anglo-Iranian Oil Company and in 1954 it was finally renamed British Petroleum.

The British Tanker Company vessels carried cargoes of crude oil (for the Company's refineries in Llandarcy and Grangemouth) and refined oil products such as fuel oil, benzene, and kerosene. Most of the vessels were destined for the United Kingdom, but India was also a large buyer of their products early on. The most important early routes were between Abadan, Iran and north-west Europe, including Britain, through the Mediterranean and Suez Canal. "Although the other routes plied by BTC [British

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Tanker Company] vessels were of lesser individual importance, they added up to an extensive international network, giving an indication of the range and changing pattern of the Company's supply operations during the period" (Bamberg 1994:138). One of the less frequent routes was the shipment of oil from the Gulf of Mexico/Central America back to the United Kingdom.

The outbreak of World War II in 1939 changed the operations of the British Tanker Company. The demand for oil was high and the British government charted all of its vessels to move fuel for its military forces. The British Tanker Company's assets were put to work for the nation, subsuming the corporation's desires in the pursuit of victory (Bamberg 1994:206). Britain's wartime administration formed the Oil Control Board, which worked with the Ministry of Shipping to ensure there were adequate oil supplies. The British Tanker Company continued a small shipbuilding program, but it was sporadic: no vessels were built in 1940, two in 1941, five in 1942, five in 1943, none in 1944, and eight in 1945. The majority of the company's efforts during World War II concentrated on keeping their existing vessels safe and employed as well as managing government owned vessels like the EMPIRE GEM. During World War II, The British Tanker Company managed 48 vessels and 46 of them, including the EMPIRE GEM, were ocean going tankers. Thirty two of the 46 were Empire ships built for, owned, or requisitioned by the British Ministry of Shipping/War Transport (Harvey and Solly 2005:26, 165-169).

EMPIRE GEM's service was initially planned to provide "oil cargo service between English ports and Iran" (National Archives US Coast Guard RG 26 box 50). Due to the changing situation as a result of World War II, EMPIRE GEM's operating route changed from its initial plans. The British government now directed merchant vessel movements either through licensing or by requisitioning. The British Tanker Company could not keep up the shipments from Iran so they looked to shorter routes closer to home and the EMPIRE GEM would sail to the United States instead of Iran.

. . . in the second half of 1940, as tanker losses to enemy action mounted, it became more necessary to conserve tanker tonnage by adopting the 'short-haul' principle, by which oil requirements were shipped from the nearest source of supply in order to save tanker tonnage. In the case of Britain, that meant reducing oil liftings from Iran in favour of nearer sources in the western hemisphere, mainly the USA. . . . the last cargo of Iranian oil arrived in Britain in August 1941 (Bamberg 1994:217-218).

EMPIRE GEM's was ready for service as a petroleum tanker in October 1941. It departed from its homeport of Glasgow, Scotland on 24 October in ballast and headed to Liverpool, England where it joined convoy ON 30. The convoy, comprised of 53 merchant vessels and 13 escorts, left on 26 October and crossed the Atlantic for the United States. EMPIRE GEM had 14 British officers and 38 British seamen onboard during its trip under the command of Captain F. R. Broad. Two other Empire ships, the tanker *Empire Bronze* headed to New York City and the CAM ship *Empire Ray* headed to Halifax,

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joined the convoy. The majority of convoy ships, including the EMPIRE GEM, were of British nationality and traveling empty, in ballast. Other convoy participants hailed from the United States, Norway, Panama, Sweden, Iceland, and Holland with cargos of coal, passengers, or general unspecified freight. The convoy's ships dispersed on 9 November off eastern Canada at the geographic position 43.10 N latitude 52.33 W longitude. The final destination for the individual ships was Curacao, Jamaica, Trinidad, Providence, Charleston, New York City, Sydney, Halifax, and Montreal. EMPIRE GEM continued onto Providence, Rhode Island arriving there on 13 November. It loaded a cargo of spirits/kerosene with the help of its local agent, Goff and Page (Convoy Web 2012a.; Lawson 2001a.; National Archives United States Coast Guard RG 26 box 50). On 15 November, it departed Providence for a return trip across the Atlantic.

EMPIRE GEM steamed from Providence to Halifax where it joined convoy HX 161. The convoy, comprised of 51 merchant ships and 15 escorts, departed Halifax on 21 November 1941 and arrived in Liverpool on 6 December 1941. EMPIRE GEM was joined in the crossing by one other Empire ship, the merchant vessel *Empire Lugard*. Almost all the convoy ships were of British nationality with a few others hailing from Canada, Norway, Panama, and Sweden. EMPIRE GEM was one of at least 19 British tankers in convoy HX 161 that carried petroleum products such as petrol, gas oil, aviation gas, and lubricating oil (Lawson 2001b; Convoy Web 2012b).

Departure	City Depart	Cargo	Arrival	City Arrive	Details
10/24/1941	Glasgow, Scotland	ballast	11/13/1941	Providence, RI	crossed Atlantic with convoy ON 30 (departed Liverpool 10/26) (dispersed 11/9)
11/15/1941	Providence, RI	spirits/kerosene	12/11/1941	Avonmouth, England	crossed Atlantic with convoy HX 161 (departed Halifax 11/21)(arrived Liverpool 12/6)
12/15/1941	Avonmouth, England	ballast	1/10/1942	Mobile, AL	crossed Atlantic with convoy ON 48 via Halifax (departed Liverpool 12/19) (dispersed 12/31)
1/14/1942	Mobile, AL	ballast	1/16/1942	Port Arthur, TX	sailed to TX to load petroleum, local agent Lykes Bros.
1/18/1942	Port Arthur, TX	spirits/kerosene			sunk off NC en-route to Halifax then England

Table 2. EMPIRE GEM's trips 1941-1942 (Registry of Shipping and Seamen: War of 1939-1945 and Merchant Shipping Movement Cards BT 389-38).

After a short turn around at Avonmouth, England, EMPIRE GEM returned to the United States. It sailed with convoy ON 48 that departed Liverpool on 19 December 1941. The convoy, comprised of 53 merchant ships and 11 escorts, was made up of primarily British vessels with a few vessels from Norway, Holland, Sweden, and the United States. EMPIRE GEM was joined by eight other Empire ships, the tanker *Empire Druid*, tanker *Empire Gold*, cargo ship *Empire Grenfell*, cargo ship *Empire Haven*, merchantman *Empire Mahseer*, merchantman *Empire Moonbeam*, cargo ship *Empire Pakeha*, and CAM ship *Empire Spray*. The convoy's ships dispersed on 31 December off eastern Canada (43.59 N 54.56 W). Vessels in convoy ON 48 were headed to Baltimore, Boston, Philadelphia, New York City,

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New Orleans, Mobile, Houston, Port Arthur, Texas City, Beaumont, Curacao, Aruba, Trinidad, Buenos Aeries, Halifax, St Johns, Vancouver, and Singapore (Convoy Web 2012c.). EMPIRE GEM arrived in Mobile, Alabama on 10 January 1942. Coast Guard records indicated that EMPIRE GEM's visit to Mobile was for dry docking and repairs (National Archives US Coast Guard RG 26 box 50). Four days later, on 14 January, the tanker departed Mobile with its 51 man British crew and headed for Port Arthur, Texas where it arrived on 16 January.

While in Port Arthur, Lykes Brothers was EMPIRE GEM's local agent and in-charge of securing and loading its cargo. EMPIRE GEM left Port Arthur on 18 January 1942 with a cargo of approximately 10,000 tons of spirits/kerosene (Registry of Shipping and Seamen: War of 1939-1945 and Merchant Shipping Movement Cards BT 389-38). Primary source documents from the National Archives in England indicated that EMPIRE GEM loaded spirits/kerosene. Other sources provided contradictory reports on the EMPIRE GEM's cargo. The website uboat.net described the tanker as carrying 10,962 tons of motor spirit. U. S. Coast Guard records state that it had a cargo of gasoline, while other secondary source books declare it had 10,600 tons of gasoline onboard (Brechtelsbauer [1995-2013]b.; National Archives US Navy RG 38 box 410; Gentile 1993:69). This nomination's authors believe the EMPIRE GEM loaded spirits/kerosene in Port Arthur, Texas based on the primary source merchant shipping records house in the British National Archives. Archaeological survey of the site and collection of a sample from its tanks should determine the nature of EMPIRE GEM's cargo.

While en-route by itself to Halifax to meet its cross-Atlantic convoy, U-66 torpedoed the EMPIRE GEM 28 miles off Cape Hatteras, North Carolina on 23 January 1942. at 19:45. The tanker had been sailing in moderate seas with a westerly wind at 11.5 knots with a dimmed masthead light and side lights, as directed by the British Naval Control at Galveston, Texas. Just prior to the incident EMPIRE GEM passed the American merchant ship *Venore*, which was sailing from Chile to Baltimore with a cargo of 8,000 tons of iron ore. Upon reaching the Diamond Shoals Light ship the EMPIRE GEM changed heading to its next leg of its zigzag course. At 1945, when the tanker was 18 miles away from the lightship the U-66 fired two torpedoes that hit EMPIRE GEM's aft starboard tank causing a large explosion and fire (National Archives US Navy RG 38 Box 225; Gentile 1993:69). The *Venore*'s third mate recalled the incident in the North Atlantic Naval Coastal Frontier War Diary from January 1942 (Chapter 1:2).

The Third Mate was waiting to relieve the watch when he was suddenly startled by the sound of a "terrific explosion" on the starboard quarter. Turning, he saw, about a mile away, the burning hull of the EMPIRE GEM silhouetted against the darkness by a fire that climbed five-hundred feet into the night air. As he watched, the black hull of a submarine came round the stern of the sinking ship and moved into the circle of light.

EMPIRE GEM's radio officer managed to send out an SOS for help that was picked up by the *Venore*, which was only two to three miles away. Another message was sent from a portable transmitter that was

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received by the Fifth Naval District shore stations. EMPIRE Gem's crew tried to launch lifeboats, but were unsuccessful due to the intense heat onboard the burning vessel (Gentile 1993: 70). Soon after the U-66 torpedoed the EMPIRE GEM it turned its sights on the *Venore*. It fired several torpedoes that sank the vessel killing seventeen of its forty one man crew.

After the torpedoes struck, the EMPIRE GEM continued to motor in a westerly direction for three more hours at full speed before the engines finally stopped on 24 January. During this time the stern was enshrouded by a fireball. The tanker broke in half and the stern section sank. Onboard the still floating bow was EMPIRE GEM's captain, Francis Reginald Broad and its radio operators Thomas Orrell (2<sup>nd</sup> radio officer) and Ernest McGraw (1<sup>st</sup> radio officer). The sailors managed to drop its two anchors and keep the bow in place while awaiting rescue from Coast Guardsmen from Ocracoke Coast Guard Station. All three men jumped into the water but only Captain Broad and Officer Orrell survived (Gentile 1993: 70).

Under interrogation, Captain Broad admitted that confusion was so great after the explosion that 'although two decoding tables had been thrown over the side in weighted bags, other documents such as routing instructions, zigzag tables, confidential books, and Navy merchant codes were still onboard in a weighted box in the wheelhouse. In response to this, an officer from the District Intelligence Office was dispatched to the scene of the wreck on January 28<sup>th</sup>. He found the entire wheelhouse, chart room, and bridge quarters were underwater, with the port wing of the bridge exposed but entirely awash. Thus it was impossible to obtain the papers (Gentile 1997:70-71).

EMPIRE GEM's bow remained afloat and right side up for several days after the incident. The Coast Guard placed a red flashing "C" buoy near the wreck to warn mariners of the hazard to navigation. Several days later the bow capsized but it stayed buoyant. Since the bow was anchored to the seafloor with its own anchors it never drifted from its original location and reports say the bow was still at the surface on 7 April 1942 (Gentile 1993:71). The only survivors from EMPIRE GEM's 57 man crew were Captain Francis Reginald Broad and Radio Officer Thomas Orrell.

Newspapers did not report the EMPIRE GEM's loss until June 1942 and the story's details were vague and unspecific. Similar text appeared on 4 June in various papers across the United States from the *Evening Recorder* in New York to *Statesville Daily Record* in North Carolina to the *Lanesville Signal* in Ohio. The *Evening Recorder* reported that,

The German raiders bagged their biggest prize-the British tanker Empire Gem, carrying 10,600 tons of gasoline-five days after the Atlanta went down. The craft exploded in the night with a great flash visible from 50 miles and a roar heard along the Carolina coast.

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The *Statesville Daily Record* wrote, “The light from the fires of the ship was visible for 50 miles. The roar of the explosion was heard 75 miles inshore.” In July 1942, EMPIRE GEM’s captain, Francis Reginald Broad, was honored with an award from the British Merchant Navy. The award stated that the captain, “displayed great courage and resources when his ship was torpedoed and set on fire” (*Manchester Guardian* 8 July 1942). Broad was honored for his courage and resource awarded the title of Officer of the Most Excellent Order of the British Empire (OBE).

Captain Francis Reginald Broad, Master (Cadishead, Manchester).—  
The ship was torpedoed and caught fire. The engines could not be stopped, and the master and two radio officers, who were forward of the fire and could do nothing to stop the ship or help the crew, retreated to the forecastle head. The next morning, the ship broke in two and they had to jump into the sea, but only the master and one radio officer were picked up. That they survived the terrible ordeal was largely due to the master’s courage and resource. By letting go both anchors when the engines stopped he kept the doomed ship head to wind, so that the fire was blown away from the forecastle (*Manchester Guardian* 8 July 1942).

The U-66 led a very successful career that included not only sinking the EMPIRE GEM but 32 other vessels for a total tonnage of over 200,000 gross tons. It also damaged four more ships with a total tonnage of 22,738 gross tons. The Type IXC submarine had been ordered before World War II on 7 August 1939 but was not launched until 10 October 1940 from the shipyard of AG Weser in Bremen, Germany. During the war, U-66 participated in ten patrols, covering 704 days, with captains Richard Zapp, Friedrich Markworth, and Gerhard Seehausen. It was on its 4<sup>th</sup> patrol with captain Zapp that it sank the EMPIRE GEM as part of Operation Drumbeat. It had left port on 25 December 1941 and headed to Cape Hatteras. It began attacking merchant shipping of the U. S. coast on 15 January 1942. U-66 first sank the American steam tanker *Allan Jackson*, then the Canadian passenger ship *Lady Hawkins* followed by the Panamanian tanker *Olympic*. EMPIRE GEM and *Venore* were its final two victims before it headed home from its patrol to L’Orient, France. The U-66 was ultimately sunk by American forces off the Cape Verde Islands on 6 May 1944 (Brechtelsbauer 1995-2013a.).

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