BRIEF
REQUESTING FURTHER IMPROVEMENTS
TO THE HOUSTON SHIP CHANNEL, TEXAS

PRESENTED BY THE
HARRIS COUNTY NAVIGATION DISTRICT
HOUSTON, TEXAS

TO THE
UNITED STATES ARMY ENGINEERS
THE SECRETARY OF WAR
AND
THE CONGRESS OF THE UNITED STATES

MARCH 26, 1935
Col. E. H. Marks,
United States District Engineer,
United States Engineer Office,
Galveston, Texas.

Dear Col. Marks:

In compliance with request contained in your circular dated March 18, that all data and argument for further improvement of the Houston Ship Channel, Texas, be submitted in written brief instead of orally at hearing scheduled for March 22nd and later cancelled, the Commissioners of the Harris County Houston Ship Channel Navigation District, representing the citizens of Harris County in the handling of all matters pertaining to the waterway and its development, present here-with our request for further deepening and widening of our channel to the sea, together with all available data and statistics showing present condition and need of improvements.

For your convenience this data has been arranged in the form suggested in Paragraph 4 of your circular letter and for clear presentation the following is emphasized:

(Exhibit A) 1. Map showing mile posts and Government 1000' stations on entire channel above Morgan Point and showing all dumping areas from Morgan Point to basin, in colors.

a. A table accompanying map and showing: (a) Mile posts, (b) General location, (c) Government stations, (d) Length sub-stations, (e) Dimensions present channel (as will be completed under present contracts), (f) Dimensions of desired section, (g) Estimate of yardage to be removed, (h) Spoil area to be used, (i) Total of all yardage in the several principal sections such as Bay, River and Bayou sections. The Bay section is treated as one unit 24.5 miles in length.
<table>
<thead>
<tr>
<th>Mile</th>
<th>Location</th>
<th>Gov't. Station</th>
<th>Distance Fee</th>
<th>Present Depth</th>
<th>Present Width</th>
<th>Proposed Depth</th>
<th>Proposed Width</th>
<th>Cubic Yards</th>
<th>Side of Channel No.</th>
<th>Tract</th>
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<tbody>
<tr>
<td>0-24.5</td>
<td>Bolivar Roads to Morgan Cut Across Galveston Bay</td>
<td>133,500</td>
<td>131,000</td>
<td>34</td>
<td>400</td>
<td>36</td>
<td>400</td>
<td>4,000,000</td>
<td>Both</td>
<td>Bay Section</td>
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<tr>
<td>24-26</td>
<td>Morgan Cut</td>
<td>0-2,500 Bay</td>
<td>2,500</td>
<td>34</td>
<td>300</td>
<td>36</td>
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<td>60,000</td>
<td>East</td>
<td>Atkinson Island - E. J. Sullivan</td>
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<tr>
<td>26-27</td>
<td>San Jacinto Bay</td>
<td>0-5,000 Riv.</td>
<td>5,000</td>
<td>34</td>
<td>200</td>
<td>36</td>
<td>350-350</td>
<td>550,000</td>
<td>East</td>
<td>Hog Island - Navigation District</td>
</tr>
<tr>
<td>27-28</td>
<td>Mouth Goose Creek</td>
<td>10,000</td>
<td>5,000</td>
<td>34</td>
<td>200</td>
<td>36</td>
<td>300-400</td>
<td>460,000</td>
<td>Both</td>
<td>Hog Island - Navigation District</td>
</tr>
<tr>
<td>28-29</td>
<td>Baytown</td>
<td>16,000</td>
<td>6,000</td>
<td>34</td>
<td>200-250</td>
<td>36</td>
<td>300-400</td>
<td>800,000</td>
<td>Both</td>
<td>Spillmans Island - Humble Oil</td>
</tr>
<tr>
<td>29-30</td>
<td></td>
<td>21,000</td>
<td>5,000</td>
<td>34</td>
<td>200-250</td>
<td>36</td>
<td>300-400</td>
<td>700,000</td>
<td>Both</td>
<td>McKie Peninsula - Dorga</td>
</tr>
<tr>
<td>30-31</td>
<td>RIVER - BAYOU SECTION - BAYTOWN TO NORSWORTHY:</td>
<td>27,000</td>
<td>6,000</td>
<td>34</td>
<td>200-250</td>
<td>36</td>
<td>300-400</td>
<td>1,000,000</td>
<td>West</td>
<td>Alexander Island - Navigation Dist.</td>
</tr>
<tr>
<td>31-32</td>
<td>Scott Bay</td>
<td>32,000</td>
<td>5,000</td>
<td>34</td>
<td>150-200</td>
<td>36</td>
<td>250</td>
<td>400,000</td>
<td>West</td>
<td>Alexander Island - Navigation Dist.</td>
</tr>
<tr>
<td>32-33</td>
<td>Peggy Lake</td>
<td>37,000</td>
<td>5,000</td>
<td>34</td>
<td>250</td>
<td>36</td>
<td>250</td>
<td>150,000</td>
<td>Both</td>
<td>Barnes Island - Rocke</td>
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<tr>
<td>33-34</td>
<td>San Jacinto River</td>
<td>42,000</td>
<td>5,000</td>
<td>34</td>
<td>150-250</td>
<td>36</td>
<td>250</td>
<td>500,000</td>
<td>Both</td>
<td>Wooster Peninsula-San Jacinto Whf. Co.</td>
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<tr>
<td>34-35</td>
<td>Lynchburg Basinment</td>
<td>48,000</td>
<td>6,000</td>
<td>34</td>
<td>150-240</td>
<td>36</td>
<td>250</td>
<td>100,000</td>
<td>Both</td>
<td>Wooster Peninsula-San Jacinto Whf. Co.</td>
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<tr>
<td>35-36</td>
<td>Opposite Batteleground</td>
<td>52,000</td>
<td>4,000</td>
<td>34</td>
<td>265-300</td>
<td>36</td>
<td>600</td>
<td>500,000</td>
<td>South</td>
<td>Wooster - Miller</td>
</tr>
<tr>
<td>36-37</td>
<td>Parker Brick Yard</td>
<td>58,000</td>
<td>6,000</td>
<td>34</td>
<td>170-225</td>
<td>36</td>
<td>250</td>
<td>900,000</td>
<td>South</td>
<td>Lynchburg - Various</td>
</tr>
<tr>
<td>37-38</td>
<td></td>
<td>63,000</td>
<td>5,000</td>
<td>34</td>
<td>150-260</td>
<td>36</td>
<td>250</td>
<td>500,000</td>
<td>Both</td>
<td>Lynchburg - Various</td>
</tr>
<tr>
<td>38-39</td>
<td>Shell Petroleum</td>
<td>69,000</td>
<td>6,000</td>
<td>34</td>
<td>170-250</td>
<td>36</td>
<td>250</td>
<td>350,000</td>
<td>North</td>
<td>Houston Oil. Various</td>
</tr>
<tr>
<td>39-40</td>
<td></td>
<td>74,000</td>
<td>5,000</td>
<td>34</td>
<td>150-200</td>
<td>36</td>
<td>250</td>
<td>500,000</td>
<td>North</td>
<td>Houston Oil. Various</td>
</tr>
<tr>
<td>40-41</td>
<td>Greens Bayou</td>
<td>79,000</td>
<td>5,000</td>
<td>34</td>
<td>150-200</td>
<td>36</td>
<td>250</td>
<td>500,000</td>
<td>North</td>
<td>Rose-Eyring</td>
</tr>
<tr>
<td>41-42</td>
<td>Worsworthy</td>
<td>85,000</td>
<td>6,000</td>
<td>34</td>
<td>250</td>
<td>36</td>
<td>250</td>
<td>700,000</td>
<td>North</td>
<td>Houston Oil. Various</td>
</tr>
<tr>
<td>42-43</td>
<td></td>
<td>90,000</td>
<td>5,000</td>
<td>34</td>
<td>150-230</td>
<td>36</td>
<td>250</td>
<td>650,000</td>
<td>North</td>
<td>Navigation District - Brooks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95,000</td>
<td>5,000</td>
<td>34</td>
<td>150-250</td>
<td>36</td>
<td>250</td>
<td>650,000</td>
<td>North</td>
<td>Navigation District - Brooks</td>
</tr>
</tbody>
</table>

### DUMPING GROUND

- **North:** Atkinson Island - E. J. Sullivan
- **North:** Hog Island - Navigation District
- **North:** Spillmans Island - Humble Oil
- **North:** McKie Peninsula - Dorga
- **North:** Alexander Island - Navigation Dist.
- **West:** Barnes Island - Rocke
- **West:** Wooster Peninsula-San Jacinto Whf. Co.
- **West:** Lynchburg - Various
- **West:** Houston Oil. Various
- **West:** Navigation District - Brooks
- **West:** Navigation District - Brooks
- **West:** Navigation District - Brooks
- **West:** Navigation District - Jones
- **West:** Navigation District - Jones
<table>
<thead>
<tr>
<th>Section</th>
<th>Company</th>
<th>Price</th>
<th>Depth</th>
<th>Width</th>
<th>Drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td>43-44</td>
<td>Pasadena Ferry</td>
<td>100,000</td>
<td>5'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>44-45</td>
<td>Texas Company</td>
<td>105,000</td>
<td>5'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>45-46</td>
<td>Sinclair</td>
<td>111,000</td>
<td>6'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>46-47</td>
<td>Manchester Easement</td>
<td>116,000</td>
<td>5'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>47-48</td>
<td>Manchester Easement</td>
<td>121,000</td>
<td>5'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>48-49</td>
<td>Harsburg</td>
<td>127,000</td>
<td>6'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>49-50</td>
<td>Long Beach</td>
<td>131,000</td>
<td>4'</td>
<td>34'</td>
<td>36'</td>
</tr>
<tr>
<td>Basin</td>
<td></td>
<td>133,000</td>
<td>2'</td>
<td>34'</td>
<td>1,100 Dia.</td>
</tr>
</tbody>
</table>

Grand Total - Cubic Yards 15,940,000

Table No. 1
b. Houston is a manufacturing and business center of considerable proportions. In a comparatively few years it has come to be the largest city in Texas and in the Southwest. Concentrated at Houston are all forms of transportation agencies. This concentration of transportation is an economic thing which is served by the ship channel. When the ship channel was constructed to this economic center, there was a saving in all freight rates from the Southwest to the coast. Existing freight rates to the coast were less from a given point in the Southwest to Houston. At the present time rates from the Southwest to the coast, including Houston, have been equalized, but in effecting equalization the lower rate to Houston has been used. Therefore, the digging of the Houston Ship Channel and making it possible for steamship service and land transportation to meet at Houston effected a reduction in all of the freight rate structure serving the Southwest and the Texas ports.

The volume of business which can increasingly be served in the future, is set forth in Table No. 2. This table is taken from the Lockwood-Green Engineers, Inc., study of the Southwest as made for the Oklahoma City Chamber of Commerce.

c. Table No. 2, submitted in (b), shows a total population for the Southwest for 1930 of over eighteen million people, and this is over 15% of the total for the United States as a whole. These figures reveal that the agricultural products of cotton, wheat, corn and live stock constitute an enormous volume of business which is seeking an outlet, and the minerals, which have thus far been practically untouched, except for petroleum, bid fair to reach enormous totals.

One of the prime factors in effecting improvement and development of all these commodities is cheap transportation rates, and it is absolutely necessary to maintain the Port of Houston waterway in such physical dimensions as will enable heavier and larger ships to make contact at Houston for all time to come.

The factors which brought the improvement in the freight rate structure must be always kept in mind, and the Port of Houston's physical dimensions of the channel and the physical facilities must be maintained in keeping with the increased volume of business, which has steadily moved over the Houston Ship Channel.
This table shows the production in the eight (8) states of the Great Southwest for the year 1929 of eight of the most important raw materials, with a comparison in each instance with the total production of the United States in these commodities.

In estimating the significance of this table it should be borne in mind that the Great Southwest contains 23.2% of the area of the United States and 15% of its population. Areas include only those parts of Colorado and New Mexico east of the mountains, while production given is one-half that of those entire states. The facts are, however, that practically all of the production of the commodities mentioned comes from the eastern part of those states, so that, to that small extent, the table is unfair to the Southwest.

Prepared under the direction of The Industrial Department of the Oklahoma City Chamber of Commerce for Lockwood-Greene Engineers, Inc. New York
d. Attached hereto, as Exhibit "C", is the statement showing the present tonnage in short tons, which originates on the Houston Ship Channel. The inbound and outbound tonnages are shown as requested, and the value.

Included in this tonnage is a large volume of West Coast commodities moving to the Southwest by steamship through the Panama Canal and by land transportation to the Southwest. This tonnage is moving in competition with transcontinental freight rates.

Included in this tonnage, as coastwise, it a large volume of traffic moving from the Southwest to and from the Northeast by coastwise vessels. Included in this tonnage is a vast tonnage of petroleum and petroleum products. This tonnage is handled by vessels which have utilized in the past, and bid fair to utilize in the future, the full channel dimensions, because these vessels are operating between Northeast ports with greater channel dimensions than Houston. Some of these ports in the Northeast have greater channel dimensions but far less tonnage than Port Houston.

Prospective tonnage flowing to and from the great area of the Southwest, which, under Table No. 2, is shown as exceeding 700,000 square miles, will consist of increased volume of fertilizer materials and increased movement from the mines and factories of the Southwest. Large quantities of raw products such as copper, coal, salt, gypsum, clay and Fullers earth, rock asphalt, potash, mica, granite, glass and carbon black are available for manufacture and transportation. Farm products of grain, rice, cotton, cottonseed cake, meal and oil, citrus and other fruits, vegetables - with an early season due to mild climate. The livestock production of the Southwest is enormous and supplies a vast northern market.

Attention is called to the unusual economic situation at the present, whereby a large tonnage of Argentine grain is moving to the Southwest through Port Houston. Due to the freight rate structure, which was effected by the construction of the Houston Ship Channel, this grain enjoys a preferential rate to the Southwest, and the service rendered the Southwest by the Port of Houston in this particular instance is an example of the use which may be expected from Port Houston at all times.

A population in the Southwest of more than eighteen million people will require an ever-increasing commerce to maintain this number of people, and the gateway through which the products of their farms and factories, and their requirements for existence, are being moved must be such as to assure free and easy movement of the vessels so that no differential as to cost and higher ocean freight rates may impair the transportation facilities of this large area.
Particular attention is called to the vast area served by Port Houston. In this area there is consumed an enormous volume of import commodities. For example, coffee. Houston's location has made it possible to develop, within the past five years, a considerable import coffee trade. As a result of the economies derived from Houston as a coffee market, rates to the Southwest have been reduced from New York and from San Francisco, and from New Orleans, and as a result coffee now moves into the Southwest on rates which are advantageous to all of the population of the Southwest.

Similar examples may be cited on canned goods, manufactured articles, sugar, beet seed, twine, newsprint paper, and many other commodities.

The effect of the transportation system centered at Houston is to maintain a stability on transportation rates to and from the Southwest, which will always guarantee the Southwest against discriminatory rates from other port gateways. For this reason alone the physical dimensions of the Port of Houston must be maintained, adequate to accommodate any vessel which is in the foreign trade and which uses the ports of San Francisco, New York, New Orleans and other ports competing with Houston for the trade with the Southwest area.

Due to the adequacy of the present channel, there no longer exists any differential due to the vessels navigating the Houston Ship Channel to the market center at Houston. The volume of business consumed at Houston and produced at Houston has made an economic center to which some eighty-five steamship lines are glad to furnish regular and ideal steamship service to the other markets of the world.

A vessel leaving Liverpool, England, for Houston, Texas, does not consider the Houston Ship Channel as any more than an arm of the sea. The vessel is trading between Liverpool, which requires Texas cotton, and Port Houston, which offers the vessel southwestern produced cotton, concentrated at Houston and other Southwest concentration points.

If the Houston Ship Channel were inadequate for these deep draft and large ocean carriers, there would soon be an element of cost enter into this transportation, which might disturb the free movement of Southwestern freight to and from the ports. Therefore, Port Houston, as an arm of the sea, must be maintained on a basis which permits the free operation of all vessels in world trade.
At the same time, Houston and the Texas ports as a whole are confronted with competition for the trade of the Southwest from a vast system of barge operations, which radiate from New Orleans. Many examples of the economies which such barge operations offer may be cited. For example, the inbound movement of aluminum ore for the vast smelters at St. Louis is now moving on a freight rate which resulted from the competition of barge and rail carriers.

Houston cannot meet the competition for tonnage moving to the great Southwest unless its waterway is maintained in such dimensions as will permit the vessels in world trade to come and go as freely as they come and go at the competing ports of San Francisco, New Orleans and New York.

f. The Harris County Houston Ship Channel Navigation District will supply all spoil grounds on which dredged material may be dumped; will free the United States from all liability from damages resulting from dredging operations; will supply the necessary rights of way which are required for the enlargement of the ship channel.

Attention is called to the generous contributions which have been made by Houston in the past. By supplying all of these contributions the Harris County Houston Ship Channel Navigation District relieves the Government from all responsibility for rights of way, spoil area, liability and other expenditures. It leaves the United States with one element of cost, namely, the actual moving of the material to clear the channel for deeper draft operation.

g. The dredging work should be undertaken by the Federal Government in accordance with a well-established policy of maintaining ocean gateways for the benefit of not only the community of Houston, but of the vast area of the Southwest. Port Houston does not serve only the community of Houston, but serves the entire Southwest and is a part of the Federal waterway system, and it would not be proper to impose on the community a burden for a project, the advantages of which accrue to so large an area.

The Harris County Houston Ship Channel Navigation District was formed in order that the burden of participating in developing the Port of Houston might be shared by so large a portion of the community as was legally possible, and this was entirely proper in the beginning, but the advantages which now accrue are nationwide and the project is properly a Federal project.
The Navigation District owns all of the property surrounding the present turning basin. This turning basin is situated well within the corporate limits of the City of Houston and this publicly owned property is operated on a basis open to all alike and on a tariff which applies true uniformity as to charges.

The particular attention of the Corps of Engineers is called to this exclusive ownership of the turning basin and the guarantee for all time to come that there can be no monopoly growth of traffic or operations on the Houston Ship Channel, because the ship channel ends on a publicly owned property and there is no possibility of ultimate ownership by private parties creating a situation whereby the Government might be dredging to a private industry or privately owned enterprise. This exclusive public ownership at the end of navigation is peculiar to Houston alone and does not exist at any other ship channel in the United States of which the writer has knowledge.

As requested in your letter of March 18th, other data which is considered pertinent to this report is submitted as follows:

LOCATION

The Houston Ship Channel, as an improved waterway, extends from the west end of Galveston Harbor at Bolivar Roads, across Galveston Bay, up the San Jacinto River and Buffalo Bayou to the turning basin in the City of Houston, a distance of fifty miles. A light draft channel 7 miles long extends up the natural waterway of Buffalo Bayou to the foot of Main Street. (U. S. Coast Charts 1282, 532, 588, 589 and 590).

Prior to works of improvement the natural depths were as follows: Across Galveston Bay 6 to 10 feet; San Jacinto River 10 to 15 feet and Buffalo Bayou 8 to 14 feet, the latter being only 50 to 100 feet wide on the bottom, with many sharp bends and curves.

WORKS OF IMPROVEMENT

While some work had been done in removing shoals and clearing snags and overhanging trees, the first comprehensive program undertaken by the United States was the dredging to depth of 18-1/2 feet, 150 feet wide across Galveston Bay and 100 feet thence to Harrisburg, commenced in 1903, under project adopted March 3, 1899, and carried on until 1907.
This depth being insufficient for seagoing vessels, the channel was deepened to 25 feet in 1912-1914 and with completion of public wharves by the City of Houston steamship service was inaugurated in August, 1915.

With the rapid industrial development of the channel and use of large vessels, especially oil tankers, the 25 feet depth soon proved inadequate, and new project was approved by Act of March 2, 1919. Under this project channel was deepened to 30 feet and widened from 150 feet to 250 feet across Galveston Bay, and from 100 to 150 feet on up to the turning basin, which was enlarged from 600 to 1,100 feet in diameter. This work was begun in 1920 and completed in 1925.

Through further modifications of this project bends were eased and section of channel widened to 200 feet from Morgan Point to Baytown, a distance of about 5 miles, this work being carried on from 1929 to 1932.

In 1933 the project was again enlarged to meet the heavy demands of traffic, and funds allotted from the Public Works Administration appropriation to provide a usable depth of 32 feet on entire channel, and to widen the Bay section from 250 feet to 400 feet. Actual dredging was commenced in October 1933, and to March 1, 1935, was about 80% completed; the Bay section widened and deepened (except the short entrance channel to Bolivar Roads being widened and deepened by Government hopper dredge), and channel deepened from Morgan Point to Carpenters Bayou with dredges working under contract to complete the bayou section during the year.

This makes available on March 1st a depth of 32 feet to the Humble Oil refinery terminal at Baytown, and Gulf Pipe Line Company wharf at Lynchburg, with prospects of completion to basin about October 1, 1935.

PORT FACILITIES

Facilities for the handling of cargo in the harbor and channel have been provided to keep abreast of the requirements, both public and private, with the result that Houston is known as one of the best equipped harbors of the south.

Situated 50 miles inland, a landlocked harbor safe from tropical storms, at the junction point of five great railroad systems, with concrete highways radiating in all directions, and at the focal point of the Great Southwest, the richest and most productive agricultural and live stock section of the United States, which has now been found to be literally "floating on oil", the port was soon destined to become one of the major ports of the Nation, ranking fifth in total commerce for 1933, and probably fourth in 1934.
The City of Houston with a $3,000,000.00 bond issue constructed the first public wharf units around the turning basin in 1915-17, followed by the Navigation District in 1922-30, as representing all of Harris County, in building wharves, warehouses and grain elevator, public belt railroad, etc. A total of 18 ship berths have been provided at public terminals, fully equipped and representing an investment of about Sixteen Million Dollars.

The Port Commission has encouraged as much as possible private industrial development on the waterway with the result that a great industrial district has been built up along the waterway, such as refineries, cement plants, fertilizer works, cotton compresses and terminals for general cargo, grain elevators and flour mills, etc., with additional berthing space for 40 vessels, or a total of 58 for the entire port. (See Industrial Map 33-13b Exhibit "A").

The capital investment of terminals and industries on and tributary to the channel amounts to well over Two Hundred Million Dollars, and in normal times 10,000 to 12,000 men are employed with a daily payroll of $50,000.00 to $60,000.00.

INDUSTRIAL DEVELOPMENT

The Houston Ship Channel from Morgan Point up to the basin, a distance of 25 miles, with several tidewater tributaries deep enough for light draft craft, provides a great industrial area on, or adjacent to deep water, served by railways, highways, natural gas, oil pipeline, ample electric power, a dependable supply of skilled and common labor, equitable climate in which all kinds of work can be carried on throughout the year. It is located convenient to raw materials such as oil, sulphur, salt, cotton, wool, grain, rice, timber, live stock, etc. and within easy reach of a rapidly growing interior market, as well as access to world markets. (See List of Industries shown on Exhibits "A" and "B").

The present capital investment, as previously stated, is well over $200,000,000.00, and this development has taken place in only a few years time, especially when "time out" is taken for the depression period since 1929.

As an indication that industrial development is reviving, attention is called to the General American Tank Storage and Terminal Company which has acquired a waterfront site on channel and is now constructing a large oil terminal to handle petroleum and its products and various kinds of vegetable oils, crude and refined. This facility will bring considerable additional tonnage and increase the number of tank steamers operating through the port. Another industry has an option on a site located on Greens Bayou which is expected to announce its plans in a few weeks.
As only about one-fourth of the industrial area is now developed and in use, the enlarged channel will no doubt attract many additional industries until its entire course will be lined with terminals and factories.

**GROWTH IN POPULATION**

<table>
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<th>Year</th>
<th>Harris County</th>
<th>City of Houston</th>
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<td>1900</td>
<td>63,786</td>
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<td>1910</td>
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<td>1920</td>
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<tr>
<td>1930</td>
<td>359,328</td>
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</tr>
<tr>
<td>1935 (Government Estimate)</td>
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</table>

**LOCAL COOPERATION**

Houston was one of the first cities of the United States to match dollars with the Government in constructing the 25 feet channel (see Rivers and Harbors Act June 20, 1910), contributing one-half of its cost, of $1,209,178.78. Then in order to be assured of adequate equipment to maintain the channel the sum of $200,000.00 was turned over to the War Department as one-half the cost of two hydraulic pipe line dredges (the "Sam Houston" and "San Jacinto" built in 1914-15). When project for deepening channel to 30 feet was approved March 2, 1919, the Act provided for a further contribution of $1,365,000.00 estimated as half the cost, after due credit was made for dredging plant. This totals $2,774,178.78 of direct cash contributions.

Further credit is due the local interests for 1,592,330 cubic yards of dredging done in the turning basin and later utilized by the Government. This work cost approximately $375,000.00.

Rights of way for easement of bends and widening of channel were donated either by adjacent property owners or acquired by the Navigation District and deeded to the Government free of all cost. Dumping grounds from Morgan Point to the basin were furnished freely, and of recent years the Navigation District has purchased outright some 2,700 acres of land at convenient locations for permanent spoil areas, expending $1,214,565.00 in such purchases.

The City of Houston also dredged the upper section of the bayou between the turning basin and the foot of Main Street, Houston, to a depth of 8 feet and width of 40 feet in 1913-14, at a cost of about $145,000.00, and contributed the sum of $1,625.78 as one-half the actual cost of removing with Government plant the snags, logs, etc. from this section.
At request of the United States Engineer Department two sites for field offices, at Morgan Point and Harrisburg, were deeded to the Government at a cost of $11,000.00 and $12,500.00 respectively.

As an aid to navigation along the winding channel the District at an outlay of $12,000.00 cut all trees and brush across the bends to provide clear sight to pilots of at least one to three miles in each direction.

The above contributions represent a total of $4,545,869.56, or equal to about one-fifth the total cost of the dredging project to date.

The Navigation District as representative of all local interests now stands ready to continue to furnish free of cost to the United States such additional rights of way along the channel for further widenings, and, should present areas be insufficient, such spoil deposit grounds as may be necessary for new work and maintenance.

The Navigation District will also agree to hold the United States harmless from all claims for damages arising from such construction and maintenance of the Houston Ship Channel.

PUBLIC BELT RAILROAD

With a view of affording all railroad lines centering at Houston (five great systems operating seventeen lines) an equal opportunity to reach the waterfront, and to prevent any monopoly by one or more railway lines, the City and Navigation District have constructed and own some 72 miles of tracks extending from the Public terminals at the turning basin down each side of the channel for ten to twelve miles, and further extensions will be made as industrial development requires. Through the Port Terminal Association the five systems operate over these tracks on basis of actual cost of switching and divide the expense on proportion to loaded cars handled by each line.

This is in effect an extension of each trunk line to the terminal and industrial facilities. As the revenue for rental of tracks is very nominal and does not equal the carrying charges, the difference is in effect a subsidy by Harris County to better protect the public and shipping interests.

HARBOR LINES

To prevent encroachment on the navigable waterway the Navigation District with the tacit approval of the War Department has adopted a policy of requiring all permanent structures to be placed back from the channel so that a full 400 feet width shall
be assured from the turning basin to Greens Bayou; 500 feet width
to San Jacinto River and 600 feet thence to Morgan Point. With
wharf structures lining the channel and vessels of 75 feet beam on
each side there will remain a fairway of 250, 350 and 450 feet
respectively over these sections.

In order to secure and maintain these widths the
various industries and terminals have, at their own expense,
dredged from bottom edge of main channel to harbor line or face
of their wharves. This has required the removal of several
million yards of earth, a considerable portion of which has, or
will be, a part of the ultimate width of channel, with consequent
saving to the United States.

On the other hand, when the full width of channel
is attained the initial amount of dredging for industries to
harbor line will be materially reduced, and this will encourage
new development, as in the past such dredging has cost from
$15,000.00 to $25,000.00 per ship berth.

TRAFFIC

As evidence that the improvement of the waterway
has been fully justified, attention is called to the summary of
commercial statistics on Page 12 of this brief; to Exhibit "C"
covering the foreign and domestic commerce for calendar year 1934,
and to the Statistical section of the Annual Reports of the Chief
of Engineers, United States Army, from 1919 to present date, all
showing a marvelous growth of water borne commerce and industrial
development.

While it is true that oil in its crude and refined
state is the principal commodity handled there is a vast quantity
of general cargo moved over the channel, equalling, if not exceeding
many of the larger and older ports of the nation.

Houston has for several years been the first cotton
exporting port of the world; ranks Third in Exports from the United
States, and in 1933 was in Fifth place on all classes of commerce,
as shown in Chief of Engineers report.

Particular attention is called to the increase in
heavily loaded and deep draft vessels from year to year as the
channel has been deepened. From 1924, when 30 feet was available to
Baytown to end of 1934 the number of vessels drawing 30 feet and
over increased from 6 to 66, and 155 to 489 drawing between 28 and
30 feet. The total arrivals and departures increasing in the same
period from 1,907 to 4,986.

Some 66 lines of steamship and 31 tanker lines are
operating regularly through the port to all parts of the world, while
tramp steamers make this a frequent port of call. Several lines
maintain their general offices in Houston, while all have agents
representing them at the port. The Maritime Committee of the
Houston Cotton Exchange and Board of Trade represents the shipping
interests in matters of inspecting vessels and cargo, conferences
with Underwriters and items affecting the traffic through the port.
### SUMMARY OF
COMMERCIAL STATISTICS
HOUSTON SHIP CHANNEL, TEXAS

Tabulation of traffic by Calendar Years

<table>
<thead>
<tr>
<th>Year</th>
<th>In</th>
<th>Out</th>
<th>Total</th>
<th>Night</th>
<th>% 30'</th>
<th>28-30'</th>
<th>Short Tons</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919</td>
<td>157</td>
<td>153</td>
<td>310</td>
<td></td>
<td></td>
<td></td>
<td>1,287,972</td>
<td>$85,034,834</td>
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<tr>
<td>1920</td>
<td>165</td>
<td>161</td>
<td>326</td>
<td></td>
<td></td>
<td></td>
<td>1,210,204</td>
<td>82,301,162</td>
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<tr>
<td>1921</td>
<td>364</td>
<td>380</td>
<td>744</td>
<td></td>
<td></td>
<td></td>
<td>2,837,349</td>
<td>78,963,388</td>
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<td>1922</td>
<td>511</td>
<td>495</td>
<td>1,006</td>
<td></td>
<td></td>
<td></td>
<td>3,365,635</td>
<td>144,272,900</td>
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<td>1923</td>
<td>707</td>
<td>693</td>
<td>1,400</td>
<td></td>
<td></td>
<td></td>
<td>4,795,324</td>
<td>230,643,731</td>
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<tr>
<td>1924</td>
<td>955</td>
<td>952</td>
<td>1,907</td>
<td></td>
<td></td>
<td></td>
<td>7,094,294</td>
<td>314,356,508</td>
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<tr>
<td>1925</td>
<td>1,193</td>
<td>1,183</td>
<td>2,376</td>
<td></td>
<td></td>
<td></td>
<td>9,747,122</td>
<td>490,006,292</td>
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<td>1,391</td>
<td>1,386</td>
<td>2,777</td>
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<td></td>
<td></td>
<td>10,576,236</td>
<td>415,578,032</td>
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<tr>
<td>1927</td>
<td>1,787</td>
<td>1,773</td>
<td>3,560</td>
<td></td>
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<td>12,003,497</td>
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<td>1928</td>
<td>1,973</td>
<td>1,962</td>
<td>3,935</td>
<td></td>
<td></td>
<td></td>
<td>12,979,826</td>
<td>598,724,008</td>
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<tr>
<td>1929</td>
<td>2,051</td>
<td>2,047</td>
<td>4,098</td>
<td></td>
<td></td>
<td></td>
<td>13,919,317</td>
<td>551,412,876</td>
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<tr>
<td>1930</td>
<td>2,108</td>
<td>2,115</td>
<td>4,223</td>
<td>110</td>
<td>2.6</td>
<td>34</td>
<td>14,991,046</td>
<td>506,898,443</td>
</tr>
<tr>
<td>1931</td>
<td>2,092</td>
<td>2,087</td>
<td>4,179</td>
<td>326</td>
<td>7.8</td>
<td>21</td>
<td>13,977,140</td>
<td>426,353,457</td>
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<tr>
<td>1932</td>
<td>2,153</td>
<td>2,155</td>
<td>4,308</td>
<td>467</td>
<td>11.3</td>
<td>36</td>
<td>12,714,432</td>
<td>348,872,755</td>
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<tr>
<td>1933</td>
<td>2,487</td>
<td>2,478</td>
<td>4,965</td>
<td>728</td>
<td>14.6</td>
<td>54</td>
<td>16,929,771</td>
<td>410,385,686</td>
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<tr>
<td>1934</td>
<td>2,489</td>
<td>2,497</td>
<td>4,986</td>
<td>820</td>
<td>16.45</td>
<td>66</td>
<td>18,516,317</td>
<td>382,684,410</td>
</tr>
</tbody>
</table>

**COTTON EXPORTS**

By Seasons August 1 through July 31

<table>
<thead>
<tr>
<th>Season</th>
<th>Bales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919 - 1920</td>
<td>69,839 Bales</td>
</tr>
<tr>
<td>1920 - 1921</td>
<td>466,185 Bales</td>
</tr>
<tr>
<td>1921 - 1922</td>
<td>478,141 Bales</td>
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<tr>
<td>1922 - 1923</td>
<td>729,942 Bales</td>
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<tr>
<td>1923 - 1924</td>
<td>1,065,612 Bales</td>
</tr>
<tr>
<td>1924 - 1925</td>
<td>1,821,828 Bales</td>
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<tr>
<td>1925 - 1926</td>
<td>1,796,671 Bales</td>
</tr>
<tr>
<td>1926 - 1927</td>
<td>2,551,439 Bales</td>
</tr>
<tr>
<td>1927 - 1928</td>
<td>1,968,969 Bales</td>
</tr>
<tr>
<td>1928 - 1929</td>
<td>2,299,513 Bales</td>
</tr>
<tr>
<td>1929 - 1930</td>
<td>1,876,413 Bales</td>
</tr>
<tr>
<td>1930 - 1931</td>
<td>2,183,028 Bales</td>
</tr>
<tr>
<td>1931 - 1932</td>
<td>2,655,094 Bales</td>
</tr>
<tr>
<td>1932 - 1933</td>
<td>2,584,506 Bales</td>
</tr>
<tr>
<td>1933 - 1934</td>
<td>2,340,630 Bales</td>
</tr>
</tbody>
</table>
It has been said that Houston is essentially an "Oil Port" and this is true, but since oil is the "life blood of the nation" what can be of more importance to our domestic and foreign commerce than the free and uninterrupted flow of oil through our ports?

The State of Texas is the greatest oil producing state of the Union, and within a radius of 100 miles of Houston are 96 producing fields, and the great East Texas field is less than 200 miles away, while new fields are being brought in almost daily along the Texas Gulf Coast.

While about 80% of the tonnage handled on the channel is oil, crude, fuel gasoline, kerosene and various grades of refined lubricating oils and greases, the remaining tonnage of general cargo is equal to total tonnage of many other United States ports. The importance of the port and its need for improvement might well be considered from the standpoint of oil alone for with a sudden stop in its movement from producing and refining points it would not be long before most of the transportation and industrial wheels of the nation would cease to turn. Especially in time of war - the oil resources of Texas would be drawn on to the utmost and every possible outlet should be so preserved and improved that there would be no danger of an enemy closing any one of these outlets, or if one were closed that others would be available.

Inasmuch as the Acting Chief of Engineers, General Pillsbury, in letter dated December 5th, 1934, to Congressman Mansfield, Chairman Rivers and Harbors Committee, House of Representatives, forwarded a report of the Board of Engineers for Rivers and Harbors (printed as Document No. 12, Committee on Rivers and Harbors, House of Representatives, 74th Congress, 1st Session) recommending to Congress the deepening of the channels to Port Arthur and Beaumont to usable depth of 34 feet at mean low tide, and widening various sections from minimum of 250 feet to maximum of 600 feet, extending from Beaumont to the Gulf, it is evident that the War Department realizes the importance of the oil movement, as the traffic through Port Arthur and Beaumont is practically all oil, this commodity in its various forms constituting 98.36% of the total tonnage for 1933 (See Annual Report, Chief of Engineers for 1934, Pages 622 through 629). As practically the same conditions apply on the Houston Ship Channel as to depths, widths and traffic, the need for improvement can be stressed on the same grounds and fully justified by the same reasons. Vessels of the major oil companies operate at practically all the Gulf ports, either to refineries or to oil terminals which are connected with pipe lines to Texas and Oklahoma oil fields, and if sufficient depth and width is not provided this port and community is at a distinct disadvantage.
OIL AND NATIONAL DEFENSE

It is only logical to assume that the great Houston refining and industrial area, the only oil port protected by fortification works (Forts Travis, San Jacinto and Crockett), located 25 to 50 miles inland and out of reach of enemy war ships, would be the port which the National Government would desire to make the most accessible for its own naval oil supply ships, and also where deepest draft battleships could enter and fuel.

When the possibility of a vessel being sunk in the channel, either by accident or design, is considered, with the danger of completely blocking the channel, it will be seen that even the suggested widths of channel are inadequate to insure against this contingency, and that from a National Defense viewpoint the maximum widths — instead of the minimum — should be approved and attained as soon as possible.

During the World War all the ports of the North Atlantic were so congested that it was impossible to get through only the most urgently needed supplies, with millions of tons lying on the docks and in railroad yards for months after the war ended. Southern ports, open all the year, convenient to the Panama Canal and serving transcontinental railways, should be developed and equipped with the best possible facilities, especially when the south is so productive of footstuffs and raw materials needed in time of war.

Training camps and embarkation ports will doubtless be located in the south — if the lessons of the late war are not so soon forgotten — and the Houston - San Antonio - Dallas area is the logical location for such camps.

A full discussion of the importance of oil and its transportation is presented in brief prepared by the Houston Chamber of Commerce, which is respectfully called to your attention.

Exhibit "D" shows the names and sizes of oil vessels now in service to the port of Houston, or which will probably be put in such service when channel dimensions enable them to operate at full capacity.

DEPTHS - TIDES

The Gulf Coast is not greatly affected by regular and wide fluctuation of the tides as is the case in the North Atlantic and European waters, the normal variation being from one-half foot to two feet. It is therefore necessary to provide navigable channels based on low, or mean low tide, as vessels cannot take advantage of a regular high tide of 6 to 10 feet for a period of several hours in which to traverse the channel.
On the contrary, the Texas coast in winter is subject to strong north winds (northers) lasting from one to several days, with result that the Gulf level is lowered from one to three feet below normal, and naturally the tidewater inland bays and streams are likewise affected and periods of low water may continue for a week, and seriously interfere with navigation. Of course, the widening, deepening and straightening of the Houston Ship Channel will permit a more rapid change in water level due to strong winds in either direction.

Freshets in Buffalo Bayou and San Jacinto River, while not frequent, seriously affect navigation. For instance, in May 1929 a rise of 31 feet was recorded at Main Street, Houston, dropping to 12.5 feet at the basin. Due to a similar rise in the San Jacinto there was only a drop of about a foot in the 16 miles to the mouth of the river, with a fall to 3.5 feet at Morgan Point, a distance of 9 miles. Traffic was delayed several days due to shoals forming in the river and bay sections requiring services of several dredges. With wider and deeper channel flood waters will be carried out to the bay more rapidly and at lower levels than has previously been the case.

All vessels for safe navigating should have at least two feet clearance under the keel, and while there is no rock to injure the ship's bottom, the soft silt washing down from the sides and brought in by freshets and tributary streams, makes it very difficult to guide the vessel if dragging through soft bottom. The Army Engineers recognize this fact and usually make proper allowance by overdepth dredging, and this practice also lengthens the periods between maintenance dredging and makes this work more economical by having a heavier cut, instead of frequent skimming.

It must also be remembered that the Houston Ship Channel is, generally speaking, a fresh water stream and only in unusually dry seasons is the water brackish above Morgan Point. Fresh water not being as dense as sea water, an allowance of eight to nine inches greater depth should be made for this waterway than would be required if it were seawater.

While the Port Commission does not permit the handling of cargoes of volatile oils in the turning basin, full ship loads of bunker oil are discharged into storage tanks, from which vessels at all public wharves and of the Houston Compress Company are supplied with bunkers while taking on or discharging cargo, thus saving many hours time and cost in shifting to oil terminals.

The Navigation District has also equipped Wharf 15 with piping, pumps, loading racks and storage tanks for handling vegetable oils to or from tank steamer.
The Public Grain Elevator in rear of Wharf 14, with storage capacity of 3,500,000 bushels, provides dead weight cargo for loading vessels to their capacity of draft.

Large quantities of scrap iron, steel and rails are loaded at the basin; nearly 200,000 tons being handled in 1934, in many cases in full cargo lots.

It will therefore be seen that deep draft vessels traverse the full length of channel and use the basin and public terminals at the head of navigation.

HURRICANES

The Gulf of Mexico has been visited many times by tropical hurricanes originating in the South Atlantic and east Caribbean Sea, moving generally west or northwest and curving to the north and northeast in the west part of the Gulf. These storms have wrought great destruction along the coast with much loss of life and damage to shipping in coast harbors.

The port of Houston, only slightly affected by these storms, offers a harbor of refuge to vessels in West Gulf waters, and in recent years when such storms have been reported as headed toward the coast of Texas many ships, dredges and small craft have taken advantage of this protection.

VESSELS PASSING

While vessels meeting each other seldom have difficulty in passing there has always been a reluctance - and in most cases a refusal - on the part of pilots and masters to permit vessels going in same direction to pass each other. Especially is this considered dangerous when the leading vessel is a tanker loaded heavily with gasoline. Many, many hours of delay are registered on account of this inability to pass in safety at any point, and this is one reason that militates against Houston as a passenger port. For instance, a fast passenger vessel departs from upper end of channel, usually the turning basin, while heavily loaded cargo and oil vessels leave at same time from the various terminals on down the 20 miles of channel. Unless able to pass safely, the passenger ship may be delayed two to four hours in reaching the Gulf. Such delay to all classes of vessels amounts to many thousands of dollars through the year.

The following table compares the density of traffic on the Houston Ship Channel with that of Panama and Suez Canals for 1934, taking into account only seagoing vessels and their net registered tonnage.
### Table: Depth, Width, Total No. Vessels, Net Registered Tons

<table>
<thead>
<tr>
<th>Depth Feet</th>
<th>Width Feet</th>
<th>Total No. Vessels</th>
<th>Per Foot Width of Channel</th>
<th>Net Registered Tons Per Width of Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston</td>
<td>30</td>
<td>150-250</td>
<td>4,986</td>
<td>24.93</td>
</tr>
<tr>
<td>Panama</td>
<td>141</td>
<td>300-1000</td>
<td>5,342</td>
<td>17.81</td>
</tr>
<tr>
<td>Suez</td>
<td>41</td>
<td>197-300</td>
<td>5,663</td>
<td>28.75</td>
</tr>
</tbody>
</table>

If all craft, tugs, barges and pleasure boats were included in the Houston statement on 200 feet width section of channel, a density of 321.6 per foot of width would be shown. (This data not available for Panama and Suez). (See Exhibit "E").

### NIGHT NAVIGATION

As a result of the improvements made to the channel during the past few years, and by the cooperation of the United States Lighthouse service in establishing and maintaining aids to navigation, the increasing night travel has been greatly facilitated; for instance, in 1930, 110 vessels passed through Morgan Cut (the halfway point where a day and night reporting service is maintained by the Houston Maritime Committee and Navigation District) between the hours of 6:00 P.M. and 6:00 A.M. In 1931, 326 vessels, 1932, 487 vessels and in 1933, 728 vessels and in 1934, 820.

Ability to navigate the channel safely at night generally saves each vessel at least one day, as the transit takes from six to ten hours, which would take two days of daylight hours. The ability to reach the terminal in time to load, or discharge by eight in the morning, or to leave port when work is finished at five in the afternoon and go on out to sea is worth many dollars to the vessel which is earning money only when on voyage.

Night navigation can only be carried on safely in a channel of sufficient width to allow ships a good margin between each other and the banks.

Navigation, especially at night, is much more hazardous on a curved and winding channel than on a straight waterway, as it is much more difficult to judge distances from aids or natural banks, or the position of an approaching vessel when only its lights are visible.
SMALL CRAFT

The ship channel and its improvements are essentially for deep sea vessels, but careful consideration must also be given to the mass of barges, tugs, gas boats and pleasure craft that ply its waters at all times.

Under head of Local Traffic it will be seen that a total of 1,163,620.1 tons of shell, sand, rice, oil and general cargo was carried on lower channel during 1934, and a total of 10,182 barges, 26,600 tugs, 23,148 launches and pleasure boats were recorded. With the opening of the Intracoastal Canal eastward to New Orleans in August 1934 a considerable movement of tugs, self-propelling barges and towed barges was inaugurated, this tonnage to Houston reaching 24,823 tons in a little over four months.

This light draft traffic adds considerable to the density of movement and to hazards of navigation of large ships, as frequently tows are under powered and cannot quickly swing to allow room for a deep draft vessel. (See Exhibit "F" airview).

NEED OF ADDITIONAL WIDTH AND DEPTH

Considering the rapidly increasing volume of traffic and the fact that the new proposed dimensions of channel cannot under most favorable circumstances be realized under two to four years, the Navigation District feels fully justified in presenting its plea for further improvements at this time.

It might well be asked at this time - What should the dimensions of the Houston Ship Channel ultimately be? Considering the location of the Port of Houston and its commercial importance its relation to other ports and hinterland, the restrictions of the jetty entrance channel, it is believed that a depth of 40 feet throughout, a bottom width of not less than 600 feet across Galveston Bay; 500 feet to Lynchburg; 400 feet to Greens Bayou; 300 feet to Vincent Bayou and 250 feet thence to the turning basin should be set up as the requirements within the next 20 years. Additional turning areas should be provided at Old River or Carpenters Bayou, at Greens Bayou and at Clinton, each 1200 to 1500 feet across.

Realizing that this extended program cannot be carried out in full at this time, and with a desire to secure only such improvements as are now necessary and fully justified by the traffic and commerce, the Navigation District Commissioners, supported by all shipping, commercial and industrial interests, asks consideration and approval of the following program.
(1) Deepen entire channel to usable depth of 34 feet at mean low tide (dredging to depths of 36-37 feet).

(2) Widen channel from present width of 200 feet to 300 feet on bottom from upper end of Morgan Cut (Station 0-0) to 5,000 feet above Baytown (Station 270 - 5-1/4 miles), with easement of bends at and south of Baytown to 400 feet at center.

(3) Widen channel from present width of 150-200 feet to full 250 feet on bottom from Baytown (Station 270) to short distance above Norsworthy (Station 950 - 13 miles), with further easement to 3,000 feet radius curve at Lynchburg.

(4) Increase width from 150 to 200 feet on bottom from Norsworthy (Station 950) to entrance of turning basin at lower end of Public Wharves 1 - 15.

(See Exhibit "A" - Map S3-13b)

The chart or graph (Exhibit "E") shows the density of traffic - both vessels and cargo - from entrance to the basin, and the widths indicated above conform very closely to this density - cross section. That is, across Galveston Bay and up to Baytown the full volume is shown, then as each major terminal is reached the vessel and cargo movement is diminished - but not the density in narrower channel - on up to the basin. Therefore, the widths asked for are based on actual traffic conditions now applying.

Reference to widths available at other major and competing ports indicate generally much wider and straighter channels.

<table>
<thead>
<tr>
<th>Rank</th>
<th>List of Ports</th>
<th>Depths</th>
<th>Widths</th>
<th>Tons Cargo 1933</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New York Harbor</td>
<td>34'</td>
<td>1000 - 2000</td>
<td>114,201,453</td>
</tr>
<tr>
<td>2</td>
<td>Philadelphia</td>
<td>35'</td>
<td>800 - 1200</td>
<td>29,188,655</td>
</tr>
<tr>
<td>3</td>
<td>Duluth-Superior</td>
<td>24'-30'</td>
<td>300 - 600</td>
<td>22,579,164</td>
</tr>
<tr>
<td>4</td>
<td>Los Angeles</td>
<td>35'</td>
<td>400 - 1000</td>
<td>17,788,327</td>
</tr>
<tr>
<td>5</td>
<td>Houston</td>
<td>30'</td>
<td>150 - 400</td>
<td>16,928,207</td>
</tr>
<tr>
<td>6</td>
<td>Beaumont</td>
<td>30'</td>
<td>125 - 300</td>
<td>16,074,146</td>
</tr>
<tr>
<td>7</td>
<td>Boston</td>
<td>40'</td>
<td>900 - 1200</td>
<td>15,378,133</td>
</tr>
<tr>
<td>8</td>
<td>Toledo</td>
<td>21'</td>
<td>200 - 400</td>
<td>14,870,119</td>
</tr>
<tr>
<td>9</td>
<td>Baltimore</td>
<td>35-37'</td>
<td>600 - 1000</td>
<td>13,257,253</td>
</tr>
<tr>
<td>10</td>
<td>New Orleans</td>
<td>35'</td>
<td>1000</td>
<td>12,713,675</td>
</tr>
<tr>
<td>11</td>
<td>Norfolk</td>
<td>40'</td>
<td>450 - 750</td>
<td>12,115,794</td>
</tr>
<tr>
<td>12</td>
<td>Buffalo</td>
<td>21'</td>
<td>550 - 1300</td>
<td>11,823,203</td>
</tr>
<tr>
<td>13</td>
<td>Fort Arthur</td>
<td>32-35'</td>
<td>250 - 450</td>
<td>11,600,015</td>
</tr>
<tr>
<td>24</td>
<td>Galveston</td>
<td>32-35'</td>
<td>800 - 1200</td>
<td>2,864,599</td>
</tr>
</tbody>
</table>
Night navigation of all sizes and types of vessels is absolutely essential if the port is to operate on an efficient basis and meet the competition of other Gulf ports, especially since the rail rates to port groups have been equalized - giving to other ports the advantage of lower base rates established by Houston through bringing the sea 50 miles inland. As shown on traffic statement, page 12, night navigation has increased greatly during the last three years and with the completion of widening the Bay section to 400 feet on March 1st we anticipate a greater night movement this year.

Considering the narrowness of channel with its turns and curves and the volume of traffic (4,986 seagoing vessels, 26,600 tugs, 10,182 barges and 23,148 small craft) navigating the waterway, it is surprising that no major accidents or collisions have occurred (see Exhibit "G"), and the Pilots, Masters and Port Authorities are very proud of the excellent record established through the past 15 years that the port has operated as a factor in world commerce, and it is with the desire to prevent accidents and to afford traffic the freest possible movement that further improvements are requested.

Delays to vessels and cargo are very expensive and constitute a direct loss to shipping and commerce that cannot well be regained. Loss to vessel in fewer trips, loss to shipper and consignee through inability to promptly deliver and use goods; loss of interest plus cost of insurance, and many other items that go to make up a huge total that the Public must ultimately pay. Free and safe navigation saves time and money.

There is a growing demand for larger and deeper draft vessels in both coastwise and foreign commerce - especially tankers. Practically all vessels of recent construction have a loaded draft of 30 feet and over - many however were built a few years ago to fit the ports they were expected to operate from. For instance, the Sinclair Refinery began operating to their plant at Houston in 1919-20 on a 25 foot channel, having vessels drawing 22-23 feet. When the 30 foot channel was assured they built larger vessels of 27-28 feet draft, and now load out to 30 feet when the tide conditions warrant.

The Standard Shipping Company, Atlantic Refining Company, Pennsylvania Shipping Company, Tidewater Oil Company and many other American and foreign tanker vessels now load to the capacity of the channel, but not to capacity of the vessel.

While heavy exports of grain formerly furnished dead-weight cargo for outbound ships, the operation is now reversed and foreign ships are bringing grain to our ports, specifying delivery where vessel can be safely accommodated. Houston with a Three Million Dollar investment in a 3,500,000 bushel public elevator, and a million bushel private elevator and flour mill must be in position to receive these deep draft ships.
Scrap iron to the extent of 191,000 tons was exported in 1934, loading several vessels to capacity of channel.

Due to low tides during northerns the general level of the channel is lowered 2 to 4 feet at times, and proper allowance must be made for this factor in loading vessels, especially in winter, as at least two feet should always be under the keel.

The silting of Bay section and in parts of the river and bayou channel require that liberal provision be made for overdepth dredging in order to maintain a fixed usable depth for a longer period of time, and to avoid frequent skimming or removing of slight shoals that would otherwise hinder traffic. The bottom being all of sand silt and clay, with no solid rock, and fairly stable banks, the construction and maintenance is simply a hydraulic pipe line dredge problem, with few of the difficulties found in other localities.

The Commissioners respectfully present the above facts for your careful consideration, together with the data and arguments presented by the various commercial, industrial and maritime interests of Houston, and we sincerely trust that you can give your full approval to the request for increased depth and widths.

Yours very truly,

NAVIGATION AND CANAL COMMISSIONERS,
HARRIS COUNTY HOUSTON SHIP CHANNEL
NAVIGATION DISTRICT

By ____________________________
Chairman.
LIST OF MAJOR INDUSTRIES LOCATED ON HOUSTON SHIP CHANNEL

The following major industries located on the channel are listed as a matter of information:

Oil Refineries:  
- Humble Oil & Refining Company  Mile
- Shell Petroleum Corporation
- American Petroleum Company
- Phillips Petroleum Company
- Crown-Central Petroleum Corporation
- The Texas Company
- Sinclair Refining Company
- Deepwater Oil Refineries

Oil Terminals:  
- Gulf Pipe Line Company
- General American Tank Storage and Terminal Company
- Gulf Refining Company
- Coastal Oil & Transport Company
- Rio Bravo Oil Company
- Humble Oil Company
- Pure Oil Company
- Magnolia Petroleum Company
- Humble Oil Company (Bunkers)

Cotton Compresses and Terminals:  
- Manchester Terminal Corporation
- Gulf Compress Company (Clinton)
- Terminal Compress & Whse. Company
- Ship Channel Compress Company
- Houston Compress Company
- Turning Basin Compress (Basin)
- Port City Compress (Northeast of basin)

General Cargo Terminals:  
- Manchester Terminal Corporation
- Morgan Line (Southern Pacific Steamship and Railroad Company)
- Port Commission (Manchester Wharf and American Maid Elevator)
- Ship Channel Compress Company
- Houston Compress Company
- Port Commission (Public wharves and grain elevator - basin)

EXHIBIT "B"
Boat Repair Yards:

Nicloy Shipyard (Lynchburg) 34
W. L. Jones Shipyard (Greens Bayou) 40-1/2
Haden Company Shipyard (Greens Bayou) 40-1/2
Horton & Horton 43
Haden Company (Simms Bayou) 46
B. H. Elliott, Harrisburg 48
Bludworth’s Shipyard (Brays Bayou) 48-1/2
Platzer Boat Works (Brays Bayou) 48-1/2
Bealy Shipyard (Brays Bayou) 48-1/2
Marine Park Shipyard (Brays Bayou) 48-1/2
W. L. Jones (Above Basin) Mile

Shell Delivery Plants:

Norris Bros. 25
W. L. Jones 40-1/2
Horton & Horton 43
Suderman & Young 46-1/2
Haden Company 46
Parker Bros. 48
Haden Company 48
Parker Bros. 49-1/2
Haden Company 50

Miscellaneous:

Haden Lime Company (Greens Bayou) 41
Davison Chemical Company (Site partly improved) 42
Houston Lighting & Power Company (Power Plant 150,000 K.W. - Capacity supplies Houston and Industrial District, Galveston and towns west to El Campo) 45
Mayo Shell Company (Oyster shell grinding plant) 46
Carnegie Steel Company (Dist. Whse.) 46-3/4
Lone Star Cement Company (Portland cement) 47-3/4
Texas Chemical Company (Chemicals and acid fertilizer) 48
International-Great Northern (Creosote tankage) 49
Armour Fertilizer Works 49-1/2
Ralston-Purina Company (Molasses Term.) 49-1/2
Maurice Pincoffs Company (Cottonseed Cake Grinding Plant) 50
Singer Iron & Steel Company (Scrap export yard) 50-1/2

Numerous other industries, cotton compresses and warehouses, general commodity and cold storage plants are located on upper channel extending six and one-half miles above the turning basin to Main Street, handling their goods by barge, rail and truck to shipside.
### Comparative Statement Showing Tonnage and Value of Imports, Exports and Coastwise Traffic Moving Over the Houston Ship Channel, for Period from January 1st to December 31st

<table>
<thead>
<tr>
<th></th>
<th>1931 Short Tons</th>
<th>1931 Value</th>
<th>1932 Short Tons</th>
<th>1932 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV. ATLANTIC</td>
<td>293,670.1</td>
<td>$9,869.245</td>
<td>312,181.6</td>
<td>$9,717.193</td>
</tr>
<tr>
<td>INV. GULF</td>
<td>42,485.8</td>
<td>$202,159.38</td>
<td>3,112,232.2</td>
<td>$153,792.473</td>
</tr>
<tr>
<td>INV. PACIFIC</td>
<td>5,696.1</td>
<td>$15,792.861</td>
<td>5,822,596.3</td>
<td>$110,293.621</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUT. ATLANTIC</td>
<td>2,090,421.6</td>
<td>$121,306.051</td>
<td>1,882,554.5</td>
<td>$11,336,653</td>
</tr>
<tr>
<td>OUT. GULF</td>
<td>583,596.1</td>
<td>$120,798.1</td>
<td>1,812,591.0</td>
<td>$13,336,653</td>
</tr>
<tr>
<td>OUT. PACIFIC</td>
<td>11,502.3</td>
<td>$2,339.039</td>
<td>79,669.1</td>
<td>$7,727,431</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>12,194,171.8</td>
<td>$118,752.696</td>
<td>11,698,921.9</td>
<td>$34,4,224,403</td>
</tr>
<tr>
<td><strong>Local Traffic</strong></td>
<td>1,782,667.8</td>
<td>$7,600,761</td>
<td>1,015,510.1</td>
<td>$4,618,352</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>13,977,139.6</td>
<td>$126,353,457</td>
<td>12,714,432.0</td>
<td>$38,872,755</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1933 Short Tons</th>
<th>1933 Value</th>
<th>1934 Short Tons</th>
<th>1934 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV. ATLANTIC</td>
<td>136,222.4</td>
<td>$9,913,288</td>
<td>353,479.8</td>
<td>$12,215,934</td>
</tr>
<tr>
<td>INV. GULF</td>
<td>3,050,663.6</td>
<td>$170,398.936</td>
<td>3,213,061.5</td>
<td>$129,415,234</td>
</tr>
<tr>
<td>INV. PACIFIC</td>
<td>380,200.7</td>
<td>$16,936,739</td>
<td>400,979.6</td>
<td>$51,555,371</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUT. ATLANTIC</td>
<td>9,659,951.7</td>
<td>$136,030.156</td>
<td>10,992,600.2</td>
<td>$115,677,817</td>
</tr>
<tr>
<td>OUT. GULF</td>
<td>5,48,051.6</td>
<td>$13,114,087</td>
<td>531,351.6</td>
<td>$11,481,723</td>
</tr>
<tr>
<td>OUT. PACIFIC</td>
<td>109,479.6</td>
<td>$13,334,327</td>
<td>1,097,689.4</td>
<td>$16,160,716</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>15,878,613.5</td>
<td>$14,821,111</td>
<td>17,353,697.7</td>
<td>$376,911,310</td>
</tr>
<tr>
<td><strong>Local Traffic</strong></td>
<td>1,051,127.7</td>
<td>$5,564,275</td>
<td>1,162,620.1</td>
<td>$5,773,070</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>16,929,771.2</td>
<td>$10,385,686</td>
<td>18,516,317.8</td>
<td>$382,684,410</td>
</tr>
</tbody>
</table>

The Calendar Year of 1934 shows an increase in Tonnage of 32.48% compared with same period of 1931.

The Calendar Year of 1934 shows an increase in Tonnage of 45.65% compared with same period of 1932.

The Calendar Year of 1934 shows an increase in Tonnage of 9.37% compared with same period of 1933.

Cotton Exports for the period of:

- **January 1st 1932 to December 31st 1932**: 2,392,927 sq. bales
- **January 1st 1933 to December 31st 1933**: 2,720,827 sq. bales
- **January 1st 1934 to December 31st 1934**: 1,607,126 sq. bales

Exhibit "C"
TRIPS AND DRAFTS OF INBOUND AND OUTBOUND VESSELS
THROUGH THE PORT OF HOUSTON SHIP CHANNEL
FOR THE CALENDAR YEAR 1934

<table>
<thead>
<tr>
<th>DRAFT FEET</th>
<th>TRIPS INBOUND</th>
<th>TRIPS OUTBOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STEAM : SHIPS</td>
<td>STEAM : SHIPS</td>
</tr>
<tr>
<td></td>
<td>MOTOR : SHIPS</td>
<td>MOTOR : SHIPS</td>
</tr>
<tr>
<td></td>
<td>BARGE : TUGS</td>
<td>BARGE : TUGS</td>
</tr>
<tr>
<td></td>
<td>LAUNCHES :</td>
<td>LAUNCHES :</td>
</tr>
<tr>
<td>OVER 30</td>
<td>:</td>
<td>:</td>
</tr>
<tr>
<td>28 TO 30</td>
<td>2 :</td>
<td>40 :</td>
</tr>
<tr>
<td>26 TO 28</td>
<td>37 :</td>
<td>406 :</td>
</tr>
<tr>
<td>24 TO 26</td>
<td>86 :</td>
<td>176 :</td>
</tr>
<tr>
<td>22 TO 24</td>
<td>112 :</td>
<td>109 :</td>
</tr>
<tr>
<td>20 TO 22</td>
<td>184 :</td>
<td>78 :</td>
</tr>
<tr>
<td>18 TO 20</td>
<td>377 :</td>
<td>70 :</td>
</tr>
<tr>
<td>UNDER 18</td>
<td>1,314 :</td>
<td>861 :</td>
</tr>
</tbody>
</table>

| T O T A L  | 2,147 :       | 312 :          |

|               | 4,868 :       | 12,946 :       |
|               | 11,341 :      | 2,137 :        |
|               | 360 :         | 4,868 :        |

|               | 12,946 :      | 11,341 :       |
# Statement of Vessels Moving Through Houston Ship Channel

## Vessel Classification

<table>
<thead>
<tr>
<th>Classes of Vessels</th>
<th>American</th>
<th>Foreign</th>
<th>Number</th>
<th>Net Tons</th>
<th>Engage</th>
<th>AVE Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrivals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steamships</td>
<td>1,829</td>
<td></td>
<td>1,829</td>
<td>6,550,113</td>
<td>20': 28'</td>
<td></td>
</tr>
<tr>
<td>Motorships</td>
<td>70</td>
<td></td>
<td>70</td>
<td>309,401</td>
<td>18': 24'</td>
<td></td>
</tr>
<tr>
<td>Tugs</td>
<td>13,300</td>
<td></td>
<td>13,300</td>
<td>412,300</td>
<td>18': 16'</td>
<td></td>
</tr>
<tr>
<td>Barges - Reg.</td>
<td>151</td>
<td></td>
<td>151</td>
<td>173,650</td>
<td>14': 18'</td>
<td></td>
</tr>
<tr>
<td>Launches</td>
<td>133</td>
<td></td>
<td>133</td>
<td>31,050</td>
<td>5': 8'</td>
<td></td>
</tr>
<tr>
<td>Barges - Unreg.</td>
<td>4,940</td>
<td></td>
<td>4,940</td>
<td>740,850</td>
<td>4': 8'</td>
<td></td>
</tr>
<tr>
<td>Launches</td>
<td>11,511</td>
<td></td>
<td>11,511</td>
<td>68,660</td>
<td>4': 6'</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31,864</td>
<td>590</td>
<td>32,454</td>
<td>10,438,130</td>
<td>12,132</td>
<td></td>
</tr>
</tbody>
</table>

| Departures         |          |         |        |          |        |         |
| Steamships         | 1,830    |         | 1,830  | 6,576,146| 22': 31'|
| Motorships         | 73       |         | 73     | 315,761  | 22': 31'|
| Tugs               | 13,300   |         | 13,300 | 412,300  | 18': 16'|
| Barges - Reg.      | 151      |         | 151    | 173,650  | 14': 18'|
| Launches           | 133      |         | 133    | 31,050   | 5': 8'  |
| Barges - Unreg.    | 4,940    |         | 4,940  | 740,850  | 4': 8'  |
| Launches           | 11,511   |         | 11,511 | 68,660   | 4': 6'  |
| Total              | 31,868   | 594     | 32,462 | 10,470,672| 12,133 |

| Grand Total        | 63,732   | 1,184   | 64,916 | 20,908,802| 21k,265|

Respectfully submitted,

J. Russell Wait,
Director of the Port.
<table>
<thead>
<tr>
<th>City</th>
<th>1933 Rank</th>
<th>1932 Rank</th>
<th>1931 Rank</th>
<th>1930 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Harbor</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Philadelphia, Pa.</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Duluth-Superior</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Los Angeles, Cal.</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Houston, Texas</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Beaumont, Texas</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Boston, Mass.</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Toledo, Ohio</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Baltimore, Md.</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>New Orleans, La.</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Norfolk, Va.</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Buffalo, N. Y.</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Port Arthur, Texas</td>
<td>13</td>
<td>10</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Cleveland, Ohio</td>
<td>14</td>
<td>14</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Newport News, Va.</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Chicago, Ill.</td>
<td>16</td>
<td>17</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>San Francisco, Cal.</td>
<td>17</td>
<td>18</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Milwaukee, Wis.</td>
<td>18</td>
<td>19</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Portland, Ore.</td>
<td>19</td>
<td>20</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Sandusky, Ohio</td>
<td>20</td>
<td>22</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Seattle, Wash.</td>
<td>21</td>
<td>24</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Ashatabula, Ohio</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Richmond Outer Harbor</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baton Rouge, La.</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carquinez Strait</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providence, R. I.</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conneaut, Ohio</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorain, Ohio</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agate Bay, Mimm.</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erie, Pa.</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rouge River, Mich.</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana Harbor, Ind.</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Detroit, Mich.</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Texas City, Texas</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairport, Ohio</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashland, Ohio</td>
<td>36</td>
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Compiled from U. S. Engineers Reports by the Port Commission of Houston, Texas.
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<th>Location</th>
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<th>1932 Tonnage</th>
<th>1931 Tonnage</th>
<th>1930 Tonnage</th>
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Chart Showing Tonnage Moved Over Houston Ship Channel.
1920 - 1937
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<th>DRAFT</th>
<th>GROSS TONS</th>
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<td>Belg.</td>
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<tr>
<td>Ital.</td>
<td>Ar dor</td>
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<td>Athelcrum</td>
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<td>31.0</td>
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Airview of Section of Houston Ship Channel showing curvature, cutoffs and proposed widening 200-250 feet at Norsworthy. Nav. District 355 acre dumping ground center.
March 22, 1935.

List of Collisions, Groundings and Accidents on the Houston Ship Channel from January 13, 1932, to date


2. February 6, 1932 - S/S "West Texas", grounded on south bank across from Baytown Dock.

3. February 12, 1932 - S/S "Kalimba", pilot A. S. Barrow, fouled pipe line of the Dredge Duplex, pulling it adrift from the dredge, near Morgan Point, to allow "El Oriente" to pass.

4. February 18, 1932 - S/S "Ditmar Koel", pilot A. S. Barrow, because rudder failed to respond, collided with Dredge Catt, in vicinity of Red Fish Reef. No damage to either.


8. March 9, 1932 - Tanker "Watertown", pilot E. B. Mercer, grounded near Buoy No. 6, due to low water. Delayed approximately 19 hours.


12. September 17, 1932 - "Elizabeth Kellogg" grounded in lower entrance to channel.


18. January 23, 1933 - S/S "Watertown", pilot W. E. Dunlap, strong wind blew vessel over against wharves at Long Reach. No apparent damage to either vessel or wharves.


21. February 13, 1933 - S/S "Baldbute", grounded between Red Fish Bar and Beacon, due to fog and bad weather conditions.

22. February 14, 1933 - S/S "El Coston" grounded near Red Fish Reef due to fog.


27. June 4, 1933 - S/S "West Harshaw", pilot J. B. Birch, vessel sheered to port, touching upper stringers of Dock No. 6 in brick wall. No damage done to dock.


30. November 23, 1933 - Steamer "Tannenfels", pilot George W. Allen, grounded in entrance channel at Bolivar Roads. "Tannenfels" grounded in attempt to pass Tanker "Delaware Sun", pilot Audley Lancaster, which was grounded in channel.

31. November 25, 1933 - S/S "Karpfanger", pilot George W. Allen, when turning in bay section near Texas City entrance buoy, because "Delaware Sun" aground in channel, was struck by "Winding Gulf". "Karpfanger" sustained considerable damage, but very little damage resulted to the "Winding Gulf". "Winding Gulf" failed to follow out proper passing after signals given.


34. April 2, 1934 - S/S "Imlay", pilot A. S. Barrow, anchored in channel near Baytown. Unable to hold ship - knocked down front range beacon.

35. May 19, 1934 - Tanker "Samuel Q. Brown", piloted by W. E. Dunlap, grounded near Buoy No. 8, to avoid striking Navy Tanker "Guyama". Delayed 18 hours. No damage to ship.


40. October 14, 1934 - S/S "Hadnot", pilot Mason Wiggins, collided with S/S "Eagle", piloted by A. S. Barrow. "Hadnot" was following close behind "Eagle" which grounded near channel entrance ranges.

41. December 1, 1934 - S/S "Western Queen" grounded one mile above Morgan Point.


Airview Houston Turning Basin. Public Wharves at head of navigation.

Airview Houston Business District.
Public and Private Terminals Houston Harbor.

Fireboat for protection of Port.
Japanese Vessel traversing the Ship Channel.

Loading Cotton at Public Wharves.